

Value Performance of European Bank Acquisitions

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Abstract

This paper provides the first analysis of value gains to acquirers in the European bank M&A wave of 1996-2004. Using a sample of 75 publicly traded banks from 19 European countries, we document positive and statistically significant abnormal returns for the aggregate acquisition sample. Partitioning the sample with respect to product-market and geographic diversification indicates strong statistical evidence that all types of domestic deals as well as bank-to-bank cross-border deals create shareholder value. Gains to cross-border diversifying deals are insignificant.

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1. Introduction

This paper examines the value performance of mergers and acquisitions among European banks of the consolidation wave between 1996 and 2004. We deal with the following questions. First, we analyse if bidder banks realize positive post-announcement gains on aggregate. Second, we investigate the characteristics of the last merger wave with respect to domestic/cross-border and horizontal/vertical transactions. Finally, we examine which type of transactions is perceived as the most value enhancing by the market.

A special feature of the paper is that we conduct an event study based on the Fama-French three-factor model. The most common method to study merger performance is based on the event study method using the market model as a benchmark (e.g. Cybo-Ottone and Mugria 2000, Houston et al 2001 and Scholtens and de Wit 2001). The market model is heavily criticized for misspecification problems in studies of security performance (Barber and Lyon 1997). The main advantage of the Fama-French model is that it takes into account two additional risk factors - size and book-to-market ratio - common to all securities. As a result, it allows to better isolate the additional risk premium due to merger announcement and thus results in more accurate inferences about the value effects of the merger. The paper is also innovative in that it uses a GARCH estimation method.

The analysis indicates positive and statistically significant value gains to acquirers in the bank merger wave of the late 1990s in Europe. Splitting the aggregate sample into four categories according to product market and cross-border diversification shows the following. The majority of mergers are carried out domestically between banks and other types of financial intermediaries. In all types of domestic transactions value gains to acquirers are positive and statistically significant. Although the number of cross-border diversifying transactions within the EU has clearly grown, these transactions do not create shareholder value. Horizontal market expansion abroad, on the other hand, does.

The paper is organized as follows. Section 2 reviews the previous literature on bank mergers, general theory of bank mergers and highlights the current trends in the European bank market. This section also addresses the methodological debate surrounding studies of merger performance and lays the foundation for the empirical analysis. Section 3 briefly describes the sample construction procedure of the final dataset. Section 4 presents a detailed description of the research methodology and explains the working of the models. Section 5 presents the results of empirical estimations. Section 6 finalizes the paper with conclusions and suggestions for future research.

2. Bank Mergers: Theory, Empirics and Trends

A large number of alternative hypotheses and theories that explain sources of merger gains have been formulated. Almost all of them are built on the common idea that mergers are motivated by factors likely to enhance shareholder value. A substantial number of such factors have been validated empirically as important sources of merger gains. They can be conveniently grouped into three basic categories based on their prediction with respect to value gains/losses to bidders and targets.

The *first type of theories* predicts positive gains to both the bidder and the target. Specific hypotheses formulated within this category are distinguished by the source of potential merger gain. These include: *efficiency improvements*, *operating synergy*, *financial synergies* and *increased market power*. Efficiency improvements usually result from a takeover of a less efficient target by a more efficient bidder. If the target is believed to have valuable assets but inefficient management, restructuring the operations of the target creates value. Although improvement of management efficiency does not require the presence of operating synergies, there might be other synergies, such as enhanced growth opportunities and the potential to achieve critical size to utilize economies of scope (Copeland et al., 2003). Hughes et al. (1999) provide strong evidence that economies of scale resulting from the combination of different but related products under one institution were among the main motives in the bank merger wave of 1990s in the US. The evidence on efficiency improvements though is quite

sparse. Houston et al. (2001) show that managers mostly expect mergers to generate cost cuts through the reduction of excess capacity rather than improve profit efficiency.

The merger theory based on *operating synergies* necessarily assumes the existence of economies of scale and scope in the industry. Another crucial assumption is that prior to merger, the scale of operations of both firms is insufficient to achieve economies of scale. Scale economies might also be realized in the case of vertical integration if the combination of different stages in the industry lifecycle achieves more efficient co-ordination of activities. Economies of scope might be achieved if the merging firms are able to benefit from each other's knowledge of specialized functions.

A number of academic studies find robust evidence that consolidation in order to cut cost and achieve operating efficiency are among the primary motives behind mergers in the banking sector. Bae and Aldrich (1999) note that the wave of bank consolidation in the majority of developed regions (North America, Japan, European Union) is a necessary strategic response to factors such as globalization of financial services, growing financial sector deregulation of the past 10-15 years and technological advance. All of these changes resulted in higher degree of competition in the banking sector demanding better operating performance and lower costs. Berger et al. (1999) as well as Hughes et al. (1999) in their studies of the bank merger wave of late 1990s in the US both confirm that costs cuts and economies of scope resulting from consolidation of administrative activities are among the primary sources of potential merger gains perceived by banks.

Financial synergies can come from a few sources. One is the lower cost of internal financing where the strong cash flows of the acquirer help a usually small target to avoid expensive external financing. Another possible source is the increased debt capacity of the combined firm, which also provides tax savings on investment income. In addition, economies of scale can be achieved in floatation and transaction cost of securities (Levy and Sarnat, 1970). Financial synergies can also come from the simple ability of the firm to acquire new assets more cheaply than building up capacity on its own. This theory is based on the concept of the q-ratio of the firm. A high q-ratio implies highly efficient management. If a

high-q-ratio firm wants to expand capacity, it is cheaper to acquire additional assets. On the other hand, a high-q-ratio firm might be acquired by a low-q-ratio bidder trying to improve its management capabilities (Copeland et al., 2003).

Increased market power can become a primary merger motive if competitive pressures in an industry are high. In this case, substantial gains can be realized by entering a new strategic product or geographic market through acquisition.

Although diversification and geographic market expansion strategies might in fact increase costs in the short-term, Hughes et al. (1999) document that for US bank M&A activity in the 1990s risk diversification through a more diversified product portfolio and strengthening market position in non-traditional financial products were the major sources of potential gains.

The *hubris hypothesis* forms a separate category of merger theories. The prediction here is that the target necessarily gains at bidder's expense and the net gains to a merger sum up to zero. The acquirer mistakenly (because of hubris, or self-confidence) believes that the value of the target is higher than its actual market value. As a result, the bidder overpays and realizes negative gains while shareholders of the target realize a profit.

The *third type of theories* explains mergers as a result of agency problems or management mistakes. Under this theory, the overall gain is necessarily negative because transactions are motivated only by the self-interest of management rather than true value considerations. The agency hypothesis does however allow for small positive target gains, but the loss to the bidder is necessarily bigger.

The case of *conglomerate mergers* is treated separately in merger and acquisition theory. The scale and the complexity of such transactions open doors to a wider range of gains. The main additional source of gains here is the ability to spread the general management functions as well as top-management activity over the entire activity range of a large diversified firm. Additionally, merger gains can arise from wealth redistribution effects such tax and labour cost savings. However, according to Copeland et al. (2003) they are unlikely to be primary motives.

The European Banking Sector

What type of potential sources of gains motivated the wave of bank mergers in 1996-2004 in Europe? Here, two clusters of information have to be taken into account: specific characteristics of the banking industry as opposed to other industries of the economy and the specific developments in the European financial sector of the last couple of decades.

The banking sector is more directly tied to the general economic conditions in the country through the provision of credit to other industries. This makes the banking subject to a tighter regulatory framework than other sectors. In addition, banks are often protected from competitive pressures. The susceptibility of banks to “domino effects” creates the necessity for authorities to bail out the failing bank to prevent a banking system crisis. Banking products are intangible, perishable and in most cases involve simultaneous consumption and production and thus often require a location close to customer base. Banking activity is also characterized by high potential for economies of scale especially for small banks with low levels of output (Molyneux et al, 2001).

Turning to the situation in Europe, it is worth mentioning that through the mid-1980s, governmental intervention into the financial sector and in particular the banking industry was still significant (ECB 1999). A large number of protection and competition-restricting barriers existed in EU member countries limiting cross-border transactions in particular. As a result, at the end of 1980s, the European banking sector was characterized by low concentration, overcapacity and lower-than-optimal operating efficiency (Gardener and Molyneux 2001). Regulatory changes, namely the Second Banking Directive in 1989, completion of the Single Market Programme in 1992, the establishment of the EMU in 1999 and the introduction of the Euro in 2002 have lifted most of the protective barriers. This brought drastic changes in the structure of the European banking industry and the strategic behaviour of banks.

The main economic consequence of these changes was a sharp increase in the level of competition. A rise in competition put a downward pressure on bank margins and forced banks to develop strategic measures to improve their cost efficiency.

De Haan and Kakes (2004) point out another important trend in the European financial sector upon the introduction of the Euro. Namely, a shift toward a more market-based financial system and a visible decline in traditional banking. Besides the increase in direct market financing in the last couple of years, De Haan and Kakes (2004) stress two other closely related trends: *disintermediation* and *securitization*. The first trend refers to the fact that an increasing amount of services related to the provision of financing traditionally carried out by banks is now being taken over by other types of financial intermediaries such as mutual funds, insurance companies and pension funds. The second trend, securitization, comes as a consequence of this. Namely, during the last decade European banks themselves have become more oriented by transforming non-marketable banking assets (such as loans) into marketable securities. An important role in this process is attributed to the appearance of new financial products such as derivatives and other kinds of asset-backed securities. The latter two trends have increased the pressure on European banks to improve performance with respect to maximizing shareholder value and to look for new profit opportunities.

All of these structural changes triggered a wave of consolidation in the European banking industry. The process of consolidation in Europe is clearly characterized by the need to increase in size in order to achieve cost efficiency. This is necessary to protect the market share in the bank's domestic market and reach the critical size to be able to compete on the European arena. In addition, market expansion both in terms of geographic and product diversification is an important motive. Although some bank merger studies attempt to separate two stages in the latest wave – the 80s when banks tend to get bigger and expand the range of their activities domestically and the 90s when they focus on gaining market share elsewhere in the EU – we find it difficult to draw a clear distinction between the two. Because differences still exist between banking industries of EU members (in terms of development and concentration), the merger wave of the late 90s is characterized by a mix of motives for

both horizontal and vertical expansion. One dominant motive that can be pointed out though is the increase in size.

Going back to the merger theories discussed in the previous section, one can then expect that bank acquisitions in Europe will yield positive gains for both the acquirer and the target. Thus, we formulate the following hypothesis:

Hypothesis 1 (The Wealth-Effect Hypothesis)

European bank mergers 1996-2004 wave created positive value gains for acquirers.

Geographic and Product Market Diversification

In addition to the assessment of bank merger performance based on the aggregate sample, the previous discussion brings up two other important points to consider in the context of the EU banking sector: the question of geographic and product market diversification. Both aspects represent potential sources of merger gains.

One of the main consequences of financial deregulation in Europe was the open door to benefits of geographic diversification. Financial deregulation allowed banks to increase the size of their geographic market and utilize economies of scope even with little or no geographic overlap. In the EU, the creation of the Single Market had a similar effect. In particular, it increased the pool of potential takeover targets by removing the shield of state anti-takeover protection.

There are two competing theories that explain how geographic deregulation might affect the value perception of a cross-border merger announcement. The *excess demand theory* states that as geographic restrictions to mergers are removed, the number of bidders competing for a given target will increase, thus increasing the price paid for the target. This, most likely, will lead to an overpaying for the target and in the long run result in underperformance in terms of abnormal stock returns in the long run (Brewer, E. et al 2000).

In contrast, the *barrier to entry theory* predicts that prices paid for cross-border targets will be lower as merger laws are liberalized (Brewer, E. et al 2000). The main reason is that barriers to entry provide the target with a protected niche where it can earn excess profits. Removing the barriers to entry increases substitutability between target banks and thereby lowers merger prices. As a result, the target is less likely to be overvalued and the bidder is less likely to disappoint the market expectations upon the announcement. The *barrier to entry theory* thus allows for positive excess returns for bidders.

Houston and Ryngaert (1994) and DeLong (2001) study the difference in market reaction to geographically diversified bank mergers on a US sample and find that the market reacts in favour of in-state and against interstate mergers. The reason for this potential positive reaction could be that the potential for cost savings is greater if the banks are exposed to the same economic environment. For European bank mergers between 1988 and 1997, Cybo-Ottone and Murgia (2000) find that only domestic deals create shareholder value while cross-border transactions fail to live up to investor expectations (abnormal returns positive but insignificant).

In the context of the European banking industry in 1996-2004, it is reasonable to expect that the excess demand theory will be more relevant. In particular, large banks from more concentrated banking sectors in Northern Europe are likely to compete for targets in the Southern part where industrial concentration is lower and bank margins are wider. This will result in overvaluation of targets and negative gains to bidders. In addition, the market might be less positive about cross-border mergers as well. Two factors - large differences in business cultures among European countries as well as strong nationalistic feelings - are likely to result in high post-acquisition costs and thus lower the potential gain. Therefore, we propose the following hypothesis:

Hypothesis 2 (Geographic Diversification Hypothesis)

Cross-border acquisitions will earn lower post-announcement gains than similar transactions carried out domestically.

The second aspect of interest is whether mergers of banks with other types of financial intermediaries result in higher gains than bank-to-bank mergers. De Long (2001) provides evidence of wealth-destruction in the case of diversifying bank mergers upon the announcement. The reason is that the market demands a risk premium on banks that expose themselves to relatively more types of interest risks than other banks by engaging in a larger variety of activities (e.g. credit risk, liquidity risk, off-balance-sheet risk). According to De Long (2001), the market prices each type of risks. Thus, the market will tend to expect a higher return on diversifying mergers than on mergers where both partners engage in similar types of activities. Although this argument might be valid, we argue that one can also expect that wise choice of the new product markets the bank wants to enter can actually result in risk diversification and thus positive value gains.

In contrast, Cybo-Ottone and Murgia (2000) report that for their sample of 1988-1997 European merger deals, abnormal returns for cross product as well as vertical mergers were both positive and statistically significant. They note that mergers between banks and insurance companies were perceived most favourably by the market and yielded an average abnormal return of 7.03% (2.54% for vertical deals) statistically significant at 1% level.

Going back to the current picture in the EU financial sector, one can expect that because of the disintermediation trend, product-diversifying (or conglomerate) mergers are likely to account for a large percentage of all deals. Moreover, bank customers and thus shareholders are likely to perceive the availability of a wider array of financial services offered by one institution as positive. In addition, assuming a wise choice of the new product market, risk diversification will add value to the bidder bank. Therefore, the hypothesis here is as follows:

Hypothesis 3 (Product Market Diversification Hypothesis)

Cross-product merger will result in higher value gains than horizontal mergers.

Previous Empirical Evidence on Bank Mergers

Just as in the case of the general stream of M&A, bank merger research is still mostly focused on the US. These studies commonly find that mergers have positive wealth effects on target banks. Results with respect to bidder wealth effects are, on the other hand, much less consistent. The majority of scholars find that returns to bidders are either negative or close to zero and statistically insignificant (Berger and Humphrey 1997; Piloff and Santomero 1998 and Houston, James and Ryngaert 2001).

A narrower stream of bank merger literature focuses on non-US transactions and here findings are somewhat different. There seems to be a difference in the market reaction to bank mergers between US and non-US studies. DeLong (2003) documents a clear difference between valuation effects of EU and US bank merger announcements: European acquirers earn about 2% more and targets gain about 7% less than their US counterparts. The main reason that explains this difference, according to DeLong, is the difference in regulatory setting between EU and US. Namely, the European universal banks are allowed to perform many more operations than commercial banks in the US, whose activity range is very much restricted by law.

A few other papers examine the welfare-creation aspects of bank mergers in Europe. Cybo-Ottone and Murgia (2000) carry out event study analysis of 54 M&A deals of large European banks which covers 13 European bank markets plus the Swiss market during the 1988-1997 period. Contrary to the common findings of US bank mergers, they report significant and positive average excess returns around the time of deal announcement. They intuitively attribute this result to institutional differences between the US and the European banking financial sectors. Namely, more liberal European regulations with respect to product diversification in the financial sector and less stringent antitrust law enforcement give European banks a potential economies of scope advantage and decrease the overall costs of diversifying mergers.

The paper of Cybo-Ottone and Mugria (2000) provides valuable insights with respect to two other important questions. First, they examine cross-country differences in increases in stock market value following the merger and find none. This shows that cross-country effects in the EU do not drive the overall results and conclude that this must be due to strong similarities in the institutional framework and the stock market valuation across Europe. Second, the authors report that a significant portion - around 33% - of their deals sample consists of cross product deals involving M&As between banks and other types of financial institutions (especially insurance and investment firms). They provide evidence that the most important deals are domestic combinations between banks and banking/insurance companies. Results for this sub-sample are the main driver of the overall result.

Scholtens and de Wit (2001) perform another study of short-term shareholder wealth effects of bank mergers in Europe as compared to the US and Japan. For Europe, they examine a sample of 17 targets and 20 bidders for the 1990-1999 period using event study methodology with a 31-day event window. They find that upon the announcement, targets realize significant positive excess returns while the returns to bidders are small, but also significant and positive. The first finding is consistent with the general M&A literature, but the second one is clearly contradictory to most findings on US samples. The authors confirm this difference with their own experiment on US data and similarly to Cybo-Ottone and Mugria (2000) attribute this contradiction to difference in institutional systems.

3. Data

The starting point of the sample construction for this study is to collect all possible information on European banks that were involved in M&A activity during the *1996-2004 period*. These data will comprise our direct test sample. In addition, we would also need a control sample in order to benchmark the performance of returns on M&A securities with (1) the market, (2) the industry and (3) non-M&A firms with similar characteristics.

We start with a list of merger and acquisitions deals in the period between January 1 of 1996 and July 31 of 2004 in the EU-15 countries. We require that both firms involved in the transaction originate from one of the EU-15 countries. The bidder is required to be listed on at least one of the European stock exchanges.

Given these requirements, we extract merger deals from the Zephyr database for the entire financial sector using two-digit NACE classification codes. Three related industries are included: NACE 65 (financial intermediation, except insurance and pension funding), 66 (insurance and pension funding, except compulsory social security) and 67 (activities auxiliary to financial intermediation). A 4-digit NACE code of 65.12 (other monetary intermediation) corresponds to the banking services classification of Zephyrus.

This selection procedure yields a total of 1167 deals, which represents the total number of M&A transactions announced and completed in the financial sector. For the final sample, we further require that at least either the bidder or the target is a bank (NACE 65.1). This step reduces the total sample size to 472 deals. After that we include only deals completed within the *1996-2004 period* and arrive at a sample of 308 deals.

Next, we filter out deals where the acquirer carried out multiple acquisitions within a 9-month period (this is approximately the length of the estimation window). The main reason behind this is to reduce the “noise”. In case of multiple shocks (acquisition announcements) over a short period of time, it is impossible to distinguish the true effect of any of those shocks. If one assumes that the usually constant variance of stock returns should change in response to such a shock only, the effect of earlier shocks will dampen any other effects. Of course, it is not possible to control for a number of other types of shocks affecting the company’s stock during the estimation period, but we can at least exclude the obvious noise due to other mergers.

The consequence of excluding acquirers with multiple transactions within 9 months is a possible selection bias against successful acquirers. Firms that have mastered the science of successful growth through acquisitions are the ones likely to do it very often. They are also the ones who are more likely to realize value *gains*. This problem is quite often cited in M&A

literature as one of the possible explanations of the common finding that for most acquirers lose value after a merger (Piloff et al., 1997). Although most academics agree with the problem, little can be done about it because it comes at the expense of test robustness. In this paper, we allow cases of multiple acquisitions if they are separated by a reasonable amount of time (12 months). By doing this, we reduce the severity of anti-successful acquirer bias. As a result, we obtain a sample of 107 deals with 16 cases of a single acquirer.

For the acquirers in this sample, we extract stock prices and firm financials from the DataStream Database. For the event study, we extract *adjusted daily prices* from 31/03/1995 to 30/06/2005 (wider than the corresponding deal period of 1996 to 2004 taking into account the additional 12 months). According to the definition of DataStream, adjusted prices are closing price adjusted for capital gains. This definition is the most economically relevant for the calculation of returns. As a result, the sample shrinks to 75 deals with 12 multiple-acquisition cases. In total, 54 acquirers are involved. This is the final test sample.

Table 1 presents summary statistics of the final sample. Classification is given by year and by types of deals. A distinguishing feature of the sample is that all except for one deal are acquisitions. The average deal value in the sample is large, 2771.70 mln EUR compared to the average deal value in the sample of Cybo-Ottone and Murgia (2000) for 1988-1997 1612 USD. Consistent with the observation of De Haan and Kakes (2004), both the numbers and the values of European bank acquisitions have increased over the past decade.

The majority (76%) of deals in the sample involve product market diversification and a large proportion (41%) represents cross-border transactions. As one of the purposes in this paper is to compare the value performance of these types of transactions, we divide the sample into four sub-samples. These are *domestic diversifying deals*; *domestic cross-product market*; *cross-border diversifying* and *cross-border and cross product market deals*. The composition of these four sub-sample groups is provided in Table 2. An interesting observation is that most deals completed domestically are also diversifying (58%). Most cross-border transactions are diversifying in character (85% involve a non-bank financial

institution). Clearly, the main trend characterizing the bank merger wave of the late 90s treated in this research is product-market diversification of European banks, both at home and with growing importance abroad. This observation is in line with the disintermediation trend reported by De Haan and Kakes (2004).

Finally, to better understand the localization of the merger wave in the regions of Europe, we present the sample composition by country in Figure 1. Bank consolidation process appears to be the most intense in Great Britain, Germany, Italy, France, Denmark and Spain.

4. Methodology

Methods that deal with overall merger gains can be classified into two basic categories. The first category, *operating performance studies*, use firm accounting data to estimate the direct effect of a merger on the operating performance of the firm. This methodology reflects the view of financial gains as perceived by managers. However, this method has some serious limitations. It is subject to noise problems and thus cannot be used to study value effects over long horizons after the merger. It is also difficult to apply in a multi-country setting because of the sensitivity to differences in accounting rules among countries. The most important limitation, however, is that this method allows to measure only financial gains which present only a fraction of total economic gains to a merger.

The second category, *market-price-based studies (event studies)*, evaluate the reaction of the stock market (investors) on the announcement of the merger by estimating the abnormal stock returns caused by a merger transaction. Transactions such as mergers are important corporate events, which are expected to have a substantial future effect on the operational efficiency and the profitability of the company. Built on the Efficient Market Hypothesis, an event study assumes that the return on a security of a firm will deviate from its normal return (equal to the total market return) if the market reacts to the unexpected release

of value-related information. If a merger announcement bears information content (the market perceives it as unexpected and value related) then the observed deviation between the expected security return and the observed one indicates the effect of the merger. In the context of this paper, the event study based on stock returns seems to be the optimal method.

Structure of an Event Study

Defining the Time Frame

Day 0

Day 0 represents the first trading day when new acquisition information reaches the market. Accurate definition of this day is important because stock market reaction can be observed only to unexpected news. In case this date is set after the effective information release, the market will already accommodate the shock and it will not be possible to observe the true value of the excess return (Piloff 1998). Data on the sample of acquisitions examined in this study records the rumour date along with the announcement date. Therefore, we define *day 0* as the earliest of the two.

The Event Window

Since we cannot know with complete certainty if day 0 was indeed chosen correctly, a few days around the announcement (with the event day itself) are usually included. In this way, one can correct for information leakage or/and slow market reaction as well as the end-of-the-trading day effects (MacKinlay 1997).

We define five alternative specifications for the event window, starting with a rather wide one and then slowly narrowing it. This *sensitivity analysis* allows observing the changes market reaction more precisely. It also allows to deal with the attenuation bias (information leakage). We define five alternative specifications following the method of Cybo-Ottone and

Murgia (2000) as: 41 days [-20,-20]; 21 days [-10,10]; 11 days [-5,5]; 5 days [-2,2]; and 3 days [-1,1].

The Estimation Window

The estimation window is the control period preceding the event period. It is used to estimate parameters of a *normal performance model*, which are then used to calculate abnormal stock returns over the event window. The estimation period does not include the day of the announcement itself in order to prevent the influence of the event-period information on the parameters of the normal return model. The closer the boundary of the event period is set to day zero, the more likely are the parameters of the normal return model to be influenced by the shock of the announcement. It is quite customary in event studies to set the end boundary of the estimation period right next to the start boundary of the event window. In this study we define the estimation window as [-270,-21] again following the method of Cybo-Ottone and Murgia (2000).

Choosing a Normal Performance Model

The dominant specification of normal returns models used for parameter estimation in event studies is the *market model*. The main drawback of this specification of the market model that it controls only for once risk factor common to all securities – the market return – and attributes any divergence to the event under consideration. Therefore, we use the Fama-French three-factor model, which in addition to the market return, controls for two other risk factors – size and book-to-market ratio – common to all securities. The model is specified as follows:

$$R_{i,t} - R_{f,t} = \alpha_i + b_i(R_{m,t} - R_{f,t}) + s_iSMB_t + h_iHML_t + \varepsilon_{i,t}$$

where

$R_{i,t}$ = return on asset i .

$R_{f,t}$ = return on a risk-free asset.

$R_{m,t}$ = return on the market portfolio.

SMB_t = return on the mimicking portfolio for the size factor.

HML_t = return on the mimicking portfolio for the book-to-market factor.

The proxy for the market factor in stock returns is the excess market return RM-RF. RM is the return on the DataStream Bank Sector Index. For RF we use the Maastricht convergence criteria government bond yield index for EU-15 countries reported by Eurostat. For more information on the construction of the Fama-French factors, see Appendix 3. See also Table 3.

The parameters b_i, s_i, h_i are estimated using the GARCH method. Knowing that errors of daily stock return series are heteroscedastic, it makes sense to consider estimation techniques that do not assume constant variance and that also take into account how the variance of the error term evolves over time. GARCH is exactly the kind of models that allows accounting for variance effects. We use the GARCH (1,1) specification:

$$\varepsilon_{it} = v_{it} \sigma_{it} \quad v_t \sim N(0,1)$$

$$\sigma_{it}^2 = \alpha_0 + \alpha_1 \varepsilon_{it-1}^2$$

The Fama-French abnormal return on security i at time t is the difference between the actual observed returns and the expected returns (forecasted value based on parameter estimates during the estimation period) for each day of the event window:

$$FFAR_{i,t} = R_{i,t} - \hat{R}_{i,t} \text{ where } \hat{R}_{i,t} = \hat{\alpha}_i + \hat{b}_i(R_{m,t} - R_{f,t}) + \hat{s}_i SMB_t + \hat{h}_i HML_t$$

Calculation of Abnormal Returns

After running the model regressions for each bank in the sample for the estimation period, we use the values of the model parameters to forecast the expected value of return $\hat{R}_{i,t}$ for each of the five event windows. The observed abnormal return on stock i on day t is calculated as the difference between the actual returns on this stock $R_{i,t}$ and the forecasted (expected) return during the period:

$$AR_{i,t} = R_{i,t} - \hat{R}_{i,t} \quad \text{where} \quad \hat{R}_{i,t} = \hat{\alpha}_i + \hat{\beta}_i R_{m,t} \quad \text{and} \quad t = \begin{matrix} -20, \dots, +20 \\ -10, \dots, +10 \\ -5, \dots, +5 \\ -2, \dots, +2 \\ -1, \dots, +2 \end{matrix}$$

The signs and the sizes of abnormal returns reflects the perception of the market as to whether the information about acquisition was perceived as value-creating or value-destroying by the market.

Aggregation of Abnormal Returns

Computed values of abnormal returns for each firm in the acquisition sample are aggregated in order to enable further statistical inference. For each event window, abnormal returns are first cumulated across time and then across firms in event time:

$$CAR_{N,T} = \frac{1}{N} \sum_{i=1}^N \sum_{t=1}^T (AR_{i,t}) \quad \text{where } T = \text{number of days in the event period.}$$

$N = \text{number of firms in the sample.}$

t-Tests

A formal test is needed to show that the observed values of abnormal returns are statistically different from zero. We conduct a *t*-test with a null hypothesis that cumulative mean

abnormal return for a given event window is equal to zero. The test statistic is specified as the standardized value of the cumulative abnormal return (Strong 1992; McKinlay 1997):

$$\frac{\mu(CAR_{N,T})}{\sigma(CAR_{N,T})}$$

The formal specification of the null hypothesis is:

$$H_0 : \frac{\mu(CAR_{N,T})}{\sigma(CAR_{N,T})} = 0$$

$$H_a \frac{\mu(CAR_{N,T})}{\sigma(CAR_{N,T})} \neq 0$$

Under the null hypothesis the event has no impact on the distribution of security returns. If the null hypothesis is rejected, we will conclude that the acquisition announcement did carry information content and that based on market perceptions, the acquisition either created or destroyed firm value.

5. Empirical Results and Discussion

The results of the event study are shown in Table 4. Detailed information of the estimates of the Fama-French models can be obtained on request. The values of abnormal returns to acquirers obtained are positive. Moreover, abnormal returns for 11-day event window are significant at 5% level and for 21 and 41-day windows at 1% level. The fact that abnormal returns are not significant for the 3 and 5-day event window may reflect that date zero is not accurately specified. It is plausible that the “rumour date” which was used as day zero in this thesis in fact represents a lag of a few days after the true day zero when the new acquisition-related information hit the market. Evidence exists that information leakage is a widespread

phenomenon with events like mergers; thus, on a rumour date recorded in the press (which is the only available to the researcher) the market already knows the information.

Nevertheless, results from the Fama-French specification provide strong support of *Hypothesis 1 (wealth hypothesis)*. On average, bidders realized positive gains in European bank acquisition of the 1996-2004 period.

Extensions: Geographic and Product Market Diversification

In order to test the second and the third hypotheses, we examine value performance of four sub-sample categories formed earlier. These tests allow to better understand the factors driving the M&A wave in the EU banking sector as well as to gain a deeper insight into market perceptions of value effects of different types of deals.

Do the dominant product-market diversifying transactions outperform bank-to-bank deal? To answer this question, we split the raw abnormal returns into four sub-samples and then cumulate them using the procedure identical to the one applied to the aggregate sample.

Results of this exercise are reported in Table 5. The dominant type of transactions in the sample – domestic transactions involving product-market diversification – indeed yield a positive value gain for the bidding bank of 0.26%. This result is statistically significant at 5% level for a 41-day event window. Thus, we can conclude, that domestic acquisitions involving banks and other types of financial institutions are perceived as value enhancing by the market.

Similarly, results in Table 5 indicate that domestic bank-to-bank acquisitions create shareholder value. Abnormal returns for the portfolio of domestic non-diversifying deals are positive and statistically significant for 5 and 11-day event windows. For these deals the gain to the acquirer is 0.77% within 2 days after the rumour and 0.43% within a 5-day period. Values of abnormal returns decline and lose significance for wider event windows, indicating that security prices return to their normal value. The conclusion is that Hypothesis 2 is supported.

The third panel of Table 5 shows positive, but statistically insignificant abnormal returns for acquirers involved in a cross-border diversifying deals. Although these types of deals have grown in numbers during the last 15 years, the market does not seem to take them as true source of gains. However, if the cross-border transaction is a horizontal one as reported in the last panel, gains are positive and statistically significant. Statistical significance is observed for 21 and 41 event windows, indicating a somewhat slow reaction of the market to the news about this type of acquisitions. In addition, the values of CARs increase with wider event windows from 0.28% to 0.57% 10 and 20 days after the news hit the market.

Results for both types of cross-border deals do not support Hypothesis 3, which predicted negative gains for cross-border acquirers. Instead, horizontal cross-border market expansion is valued positively by the market. Insignificance of results for cross-border deals involving product market diversification, on the other hand, indicate that the market still attaches a high degree of risk to deals involving too many unfamiliar factors.

6. Conclusions

This paper provides the first analysis of value performance of the European bank M&A wave of 1996-2004 that accompanied the general consolidation process of the European financial sector in the last decade. Using a sample of 75 publicly traded banks from 19 European countries, we examine gains to acquirers over five alternative periods ranging from 1 to 20 days upon the acquisition rumour.

The results suggest that European acquirers earn positive and statistically significant abnormal returns around the time of the deal rumour/announcement. This finding is consistent with other studies of European bank mergers (Cybo-Ottone and Mugria 2000, Scholtens and de Wit, 2001; Tourani and van Beek, 1999). Similarly to other European studies, this paper

presents contrasting evidence to studies based on US data where acquirers earn negative post-acquisition returns.

We also show that the consolidation process in the European banking sector in the 1996-2004 merger wave is mainly characterized by horizontal market expansion (76% of all transactions involve a different type of financial institution). Thus, we document a trend that consolidation process is underway not only in the banking sector, but in the entire financial sector in Europe. Another conclusion is that this consolidation process has largely remained a domestic phenomenon. This conclusion is confirmed by positive and statistically significant abnormal returns for acquirers in all types of domestic transactions.

Finally, although the number of cross-border transactions within the EU involving mergers of banks and other types of financial institutions has clearly grown, these transactions do not create shareholder value. Horizontal market expansion abroad, on the other hand, does create positive and statistically significant value gains.

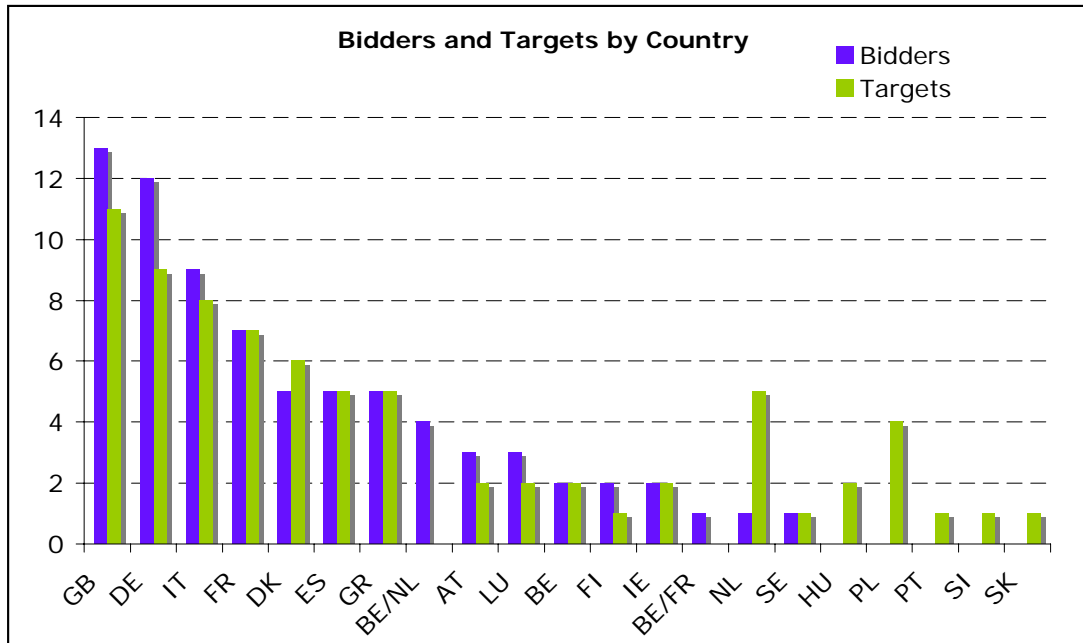
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Appendix 1: Figures

Figure 1: Partition of Sample M&A Deals by Country



Source: Zephyr Database

Appendix 2: Tables

Table 1: Summary Statistics of Mergers Acquisitions in Sample

| Year | Total N | Average Value (mln EUR) | N Cross-Border | % Cross-Border | N | | Mergers | Acquisitions |
|-------------|-----------|-------------------------|----------------|----------------|-----------|------------|----------|--------------|
| | | | | | Div | % | | |
| | | | | | ersif | Divesi | | |
| | | | | | ying | ying | | |
| 1996 | 1 | 1134.45 | 1 | 100% | 1 | 100 | 0 | 1 |
| 1997 | 5 | 1622.87 | 1 | 20% | 4 | 80% | 0 | 5 |
| 1998 | 7 | 4440.22 | 2 | 29% | 4 | 57% | 1 | 6 |
| 1999 | 13 | 1935.06 | 4 | 31% | 10 | 77% | 0 | 13 |
| 2000 | 12 | 7905.09 | 5 | 42% | 11 | 92% | 0 | 12 |
| 2001 | 13 | 4871.11 | 7 | 54% | 8 | 62% | 0 | 13 |
| 2002 | 11 | 2453.57 | 3 | 27% | 7 | 64% | 0 | 11 |
| 2003 | 9 | 569.23 | 4 | 44% | 7 | 78% | 0 | 9 |
| 2004 | 4 | 13.68 | 1 | 25% | 3 | 75% | 0 | 4 |
| Full | 75 | 2771.70 | 28 | 41% | 55 | 76% | 1 | 74 |

Source: Zephyr Database

Table 2: Sample Partition by Cross-Border and Cross-Product Diversification

| | Cross-Product | Bank-to-Bank | Totals |
|--------------|---------------|--------------|-----------|
| Cross-Border | 23 | 4 | 27 |
| Domestic | 31 | 17 | 49 |
| Totals | 54 | 21 | 75 |

Table 3: Fama-French Control Portfolio Characteristics

| | Portfolio | Average N | Average ME | Average BE/ME | Average Daily Return |
|------------------------|-----------|-----------|------------|---------------|----------------------|
| Small-Cap Firms | | | | | |
| Low BE/ME | SL | 6 | 22.92 | 0.36 | 0.00180 |
| Medium BE/ME | SM | 27 | 21.24 | 0.78 | 0.00047 |
| High BE/ME | SH | 45 | 20.87 | 1.56 | 0.00033 |
| Mid-Cap Firms | | | | | |
| Low BE/ME | ML | 33 | 198.55 | 0.26 | 0.00020 |
| Medium BE/ME | MM | 37 | 166.99 | 0.74 | 0.00024 |
| High BE/ME | MH | 33 | 155.66 | 1.37 | 0.00024 |
| Large-Cap Firms | | | | | |
| Low BE/ME | BL | 35 | 8476.44 | 0.29 | 0.00023 |
| Medium BE/ME | BM | 38 | 4109.63 | 0.66 | 0.00037 |
| High BE/ME | BH | 3 | 1510.23 | 1.41 | 0.00003 |

Table 4: Cumulative Daily Abnormal Returns (Acquirers)

| Event Window | Mean | Median | Max | Min | St.Dev. | N Pos/Neg | Test of Significance | | |
|--------------|------|--------|-----|-----|---------|--------------|----------------------|---------|-----------|
| | | | | | | | T-test | p-value | Test Stat |

| | | | | | | | | | |
|-----------|---------|--------|--------|---------|--------|-------|--------|--------|--------|
| (-1,+1) | 0.0039 | 0.0022 | 0.1150 | -0.0878 | 0.0262 | 42/32 | 1.2912 | 0.2007 | 0.1501 |
| (-2,+2) | 0.0024 | 0.0013 | 0.0551 | -0.0658 | 0.0157 | 41/32 | 1.3304 | 0.1876 | 0.1557 |
| (-5,+5) | 0.0040* | 0.0028 | 0.0885 | -0.0274 | 0.0136 | 45/28 | 2.5094 | 0.0143 | 0.2937 |
| (-10,+10) | 0.003** | 0.0021 | 0.0693 | -0.0120 | 0.0104 | 47/27 | 2.5176 | 0.0140 | 0.2927 |
| (-20,+20) | 0.002** | 0.0008 | 0.0223 | -0.0109 | 0.0063 | 41/33 | 3.1083 | 0.0027 | 0.3614 |

* indicates statistical significance at 5% level and ** at 1% level.

Table 5: Differences in Abnormal Returns fro Cross-Product and Cross-Border Deals

| Difference in Cumulative Daily Abnormal Returns: Diversifying and Cross-Border Transactions | | | | | | | | | |
|---|---------|---------|--------|---------|---------|----|----------------------|---------|--------|
| Event | | | | | | | Test of Significance | | |
| Window | Mean | Median | Max | Min | St.Dev. | N | Test | | |
| | | | | | | | T-test | p-value | Stat |
| <i>Domestic: Diversifying</i> | | | | | | | | | |
| (-1,+1) | 0.0022 | -0.0003 | 0.1150 | -0.0878 | 0.0305 | 31 | 0.40 | 0.6913 | 0.0720 |
| (-2,+2) | 0.0002 | -0.0003 | 0.0551 | -0.0658 | 0.0188 | 31 | 0.06 | 0.9518 | 0.0114 |
| (-5,+5) | 0.0029 | 0.0023 | 0.0260 | -0.0274 | 0.0116 | 31 | 1.37 | 0.1809 | 0.2503 |
| (-10,+10) | 0.0029 | 0.0023 | 0.0260 | -0.0274 | 0.0116 | 31 | 1.37 | 0.1809 | 0.2503 |
| (-20,+20) | 0.0026* | 0.0000 | 0.0208 | -0.0104 | 0.0066 | 31 | 2.22 | 0.0338 | 0.3995 |
| <i>Domestic: Non-Diversifying</i> | | | | | | | | | |
| (-1,+1) | 0.0114 | 0.0067 | 0.1022 | -0.0280 | 0.0276 | 17 | 1.70 | 0.1085 | 0.4123 |
| (-2,+2) | 0.0077* | 0.0059 | 0.0389 | -0.0132 | 0.0127 | 17 | 2.50 | 0.0237 | 0.6062 |
| (-5,+5) | 0.0043* | 0.0029 | 0.0193 | -0.0123 | 0.0082 | 17 | 2.17 | 0.0458 | 0.5250 |
| (-10,+10) | 0.0022 | 0.0023 | 0.0127 | -0.0120 | 0.0067 | 17 | 1.39 | 0.1834 | 0.3372 |
| (-20,+20) | 0.0007 | 0.0004 | 0.0108 | -0.0109 | 0.0063 | 17 | 0.46 | 0.6541 | 0.1107 |

| | | | | | | | | | |
|---------------------------------------|---------|---------|--------|---------|--------|----|-------|--------|---------|
| <i>Cross-Border: Diversifying</i> | | | | | | | | | |
| (-1,+1) | -0.0029 | -0.0018 | 0.0260 | -0.0324 | 0.0153 | 23 | -0.92 | 0.3660 | -0.1925 |
| (-2,+2) | -0.0020 | -0.0017 | 0.0217 | -0.0235 | 0.0107 | 23 | -0.89 | 0.3861 | -0.1887 |
| (-5,+5) | 0.0038 | -0.0003 | 0.0885 | -0.0164 | 0.0198 | 23 | 0.93 | 0.3641 | 0.1932 |
| (-10,+10) | 0.0033 | -0.0001 | 0.0693 | -0.0101 | 0.0158 | 23 | 0.97 | 0.3444 | 0.2062 |
| (-20,+20) | 0.0018 | 0.0022 | 0.0223 | -0.0104 | 0.0065 | 23 | 1.32 | 0.2018 | 0.2743 |
| <i>Cross-Border: Non-Diversifying</i> | | | | | | | | | |
| (-1,+1) | 0.0045 | 0.0047 | 0.0226 | -0.0138 | 0.0182 | 3 | 0.43 | 0.7087 | 0.7417 |
| (-2,+2) | 0.0045 | 0.0072 | 0.0088 | -0.0025 | 0.0061 | 3 | 1.28 | 0.3275 | 0.7417 |
| (-5,+5) | 0.0045 | 0.0072 | 0.0088 | -0.0025 | 0.0061 | 3 | 1.28 | 0.3275 | 0.7417 |
| (-10,+10) | 0.0028* | 0.0032 | 0.0038 | 0.0015 | 0.0012 | 3 | 4.03 | 0.0564 | 2.3265 |
| (-20,+20) | 0.0057* | 0.0062 | 0.0063 | 0.0044 | 0.0011 | 3 | 9.10 | 0.0119 | 5.2526 |

Appendix 3: Construction of Fama-French SMB and HML Control Factors

The 9 size-BE/ME stock portfolios are formed by following Fama and French (1992). Each year t from 1995 to 2005 acquirer banks are ranked by their Market Equity (a proxy of size) and breakpoints are measured for the bottom 30% (Small), middle 40% (Medium), and top 30% (Big). They are then used to allocate stocks in the control portfolio according to three size groups. Similarly, three breakpoints for BE/ME are used to allocate stocks to five book-to-market equity groups, Low, Medium and High. The 9 size-BE/ME portfolios are formed as the intersections of the three size and the three BE/ME groups. For example, the SL portfolio contains the stocks in the small-ME group that are also in the low-BE/ME group, and the B/H portfolio contains the big-ME stocks that also have high BE/MEs.

The rankings of ME are refreshed at the end of every June of year $t+1$. Rankings of BE/ME are refreshed on December 31 of year t . This procedure assures that book equity is known to the market well in advance. By construction, the composition of the nine portfolios is valid for $\frac{1}{2}$ year after which one of the rankings is refreshed. Summary characteristics of the nine control portfolios are presented in Table 3.

Size - the SMB (Small minus Big) portfolio – mimics the risk factor in returns related to size, is the difference, each month, between the simple average of the returns on the three small-stock portfolios (S/L, S/M, and S/H) and the simple average of the returns on the three big-stock portfolios (B/L, B/M, and B/H). Thus, SMB is the difference between the returns on small- and big-stock portfolios with about the same weighted-average book-to-market equity. This difference should be largely free of the influence of BE/ME, focusing instead on the different return behaviours of small and big stocks.

BE/ME - the HML (High minus Low) portfolio - mimics the risk factor in returns related to book-to-market equity, is defined similarly, HML is the difference, each month, between the simple average of the returns on the two high-BE/ME portfolios (S/H and B/H) and the average of the returns on the two low- BE/ME portfolios (S/L and B/L). The two components of HML are returns on high- and low-BE/ME portfolios with about the same weighted-

average size. Thus the difference between the two returns should be largely free of the size factor in returns, focusing instead on the different return behaviours of high- and low-BE/ME firms.

True mimicking portfolios for the common risk factors in returns minimize the variance of firm-specific factors. The nine size-BE/ME portfolios in SMB and HML are value-weighted. Using value-weighted components minimizes return variance since return variances are negatively related to size (Fama and French 1993). More important, using value-weighted components results in mimicking portfolios that capture the different return behaviours of small and big stocks, or High- and Low-BE/ME stocks.