

Diversification versus Specialisation : An Event Study of M&As in the European Banking Industry[◇]

Laetitia LEPETIT^{a,b} , Stéphanie PATRY^{b*} & Philippe ROUS^{b*}

^a *Department of Economics, University of Birmingham, Edgbaston, B15 2T, UK*

^b *Centre de Recherche en Macroéconomie Monétaire, University of Limoges, France.*

May 2002

Abstract

This study examines the stock market valuation in terms of expected gains of mergers and acquisitions (M&As) amongst banks that were announced between 1991 and 2001 in 13 European markets. We classify M&As according to activity, geographic specialisation or diversification. A Bivariate GARCH model is used to estimate abnormal returns taking beta variability into account. Our results document that there is, on average, a positive and significant increase in value for the group of targets' banks. Moreover, we find that on average there is a positive and significant market reaction for the two types of transactions: cross-product diversification and geographic specialisation. We further investigated the impact of M&As events in terms of systematic risk. Our results reveal that the market expects an increase in the risk exposure for «bancassurance». This result is consistent with the choice of European banking supervisory agencies to reinforce the supervision of European financial conglomerates.

JEL classification : G14, G21; G34.

Keywords: European Banks mergers and acquisitions, Bivariate GARCH, Abnormal return, beta-market risk.

[◇] We would like to thank Andy Mullineux (University of Birmingham) and Amine Tarazi (University of Limoges) for their helpful comments.

* Corresponding author. Tel: +33 (0) 555 43 57 51; Fax: +33 (0) 555 43 56 95; E-mail address: stephanie.patry@drec.unilim.fr, rous@unilim.fr, mail address: 4 place du Présidial, 87031 Limoges Cedex, France.

I. INTRODUCTION

Over the last two decades, the European banking industry has experienced an unprecedented level of consolidation as mergers and acquisitions (M&As) involving banks have taken place at record levels. According to Securities Data Corporation (SDC), in the last ten years alone more than 1223 M&As¹ have occurred in the European market. After averaging 15 deals a year up to 1985, European M&As jumped to a new level of 30-90 deals per year between 1991 and 2001. As a result, a significant number of complex financial institutions have been created.

The first issue raised by this process of consolidation is whether bank M&As have a significant value effect. To a large extent, this consolidation is based on a belief that gains can accrue through scale and scope economies, cost reduction, increased market power and reduced earning volatility. Whether or not M&As involving banks actually achieve the expected performance gains is an important question. If consolidation leads to value gains, then shareholder wealth can be increased. On the other hand, if M&As do not lead to the promised positive effect, then consolidation implies a less profitable and valuable banking industry. A reading of the literature suggests that there is no clear evidence that banking M&As are economically valuable to shareholders upon announcement (Hannan and Wolken [1989], Houston and Ryngaert [1994]). This setting raises the question of whether all bank M&As have an insignificant value effect, or whether it is possible to distinguish the types of M&A that lead to significant gains from those that do not add value.

The second issue concerns the implication of the consolidation process for the stability of the financial system. The universal banking structure that characterises Europe implies that there are no limits to product market diversification from commercial banking into investment banking. *Bancassurance* is also a phenomenon in Europe as regulation allows banks to own insurance subsidiaries and to perform in direct distribution of insurance products. Proponents of diversification assert that a larger coverage of geographic area, industries, types of loans and maturity contributes reduces the risk of bank insolvency (Hughes, Lang, Mester and Moon [1999]). Proponents of the specialisation (Lang and Stulz [1994], Berger and Ofek [1995]) contend that, in the banking industry, the diversification implied an increase in insolvency risk due to the conflicts of interest between managers and shareholders and also between managers and debtholders (Boyd, Chang and Smith [1998], Park [2000]).

¹ This figure represents complete M&As with majority interests.

This study examines the impact of European M&As announcement in terms of stock valuation and risk effects. We perform an event study analysis² of M&As deals covering 13 countries of EU plus the Swiss market. We examine the stock market effects of M&As in European banking between January 1991 and May 2001 by distinguishing between different types of M&As and determining risk effects in the European markets. Specifically, M&As are classified according to their specialisation or diversification along the dimensions of activity and geography³. This approach is useful to explain why the phenomena of bank M&A's occur in light of the fact that they do not increase firm value on average. Managers wishing to engage in mergers can justify this choice by the fact that few mergers create value.

Most of the existing studies on M&As in banking sector concern the US market. Although several studies find that the announcement of bank M&As on average, neither creates nor destroys stockholder value (Hannan and Wolken [1989], Pilloff and Santomero [1998]), some studies find the announcement of certain types of bank M&As do create value. DeLong ([2001a], [2001b]) finds that M&As focusing along geographic and activity lines create value upon announcement. Few studies evaluate the risk of failure of the newly formed banking organization in the American market. Craig and Santos [1997] observed a distinctly reduced risk for their sample of bank acquisitions for some measures of risk, but no clear effect for others. Concerning the European banking market, the recent work of Cybo-Ottone and Murgia [2000] is the only study that examines the market valuation of M&As. They analyze 54 M&As of European financial services (not just banks) taking place between 1988 and 1995 in 13 European banking markets. They find that, on average, there is a positive and significant increase in value for the average M&As at the time of the deal's announcement. Moreover, they uncover that there is a positive and significant market reaction for the M&As between banks and insurance, for domestic transactions.

Our paper differs from that of Cybo-Ottone and Murgia on four main points. Firstly, whereas these authors used data from AMDATA database of Acquisitions Monthly, which has

² An event study is an analysis of whether there was a statistically significant reaction in financial markets to past occurrences of a given type of event that is hypothesised to affect public firms' market values.

³ For example, the deal between *General de Banque SA* (Belgium commercial bank) and *Fortis AG* (Belgium insurance company) in 1998 is classified as a M&A with cross-product diversification and geographic specialisation. On the contrary, the deal between *Dresdner Bank* (German commercial bank) and *Kleinwort Benson Iberfomento* (Spanish commercial bank) in 1998 is classified as a M&A with geographic diversification and activity specialisation.

been discontinued, the statistical data required for our issue have been drawn from SDC M&As database. SDC provides a somewhat more complete coverage than AMDATA, particularly with respect to national operations and transactions in the financial sector⁴. Secondly, we analyse M&As that were announced on European markets from January 1991 to May 2001 and our sample construction is different. Thirdly, we model abnormal returns according to the Bivariate GARCH process to control for time-varying beta volatility instead of using the market model which assumes constant beta. Although the use of the market model to estimate the abnormal return has a long standing, a growing body of evidence exists which suggests that both individual stock and portfolio betas are conditional in that beta varies over time (see Fabozzi and Francis [1978], Bos and Newbold [1984]). Explicitly modelling time varying betas avoids the problem of fallacious abnormal returns induced by a misspecification of beta's characteristics. Fourthly, we analyse the valuation effects on the market both in terms of both return and risk.

The paper is organized as follows. Section 2 presents the sample design and the data sources on European bank M&As. Section 3 explains how abnormal returns are constructed using the Bivariate GARCH scheme and presents the results. Section 4 shows the probit analysis of deal type and abnormal returns. Section 5 tests for market-beta stability between the period before and after M&As announcement. Section 6 concludes.

II. SAMPLE DESIGN AND DATA SOURCES ON EUROPEAN BANK M&A

The primary data employed in this paper are daily stock returns of European banks involved in M&As during the sample period from January 1991 through May 2001. The daily stock returns are obtained from Datastream and the list of M&As announcements from Thomson Financial Securities Data Company database (SDC-M&A). In our paper, the terms merger and acquisition are used interchangeably to refer to transactions involving the combination of two independent firms to form one or more commonly controlled entities. The distinction between a merger and an acquisition is somewhat vague⁵. A merger is often defined as a transaction where one entity is combined with another so that at least one initial

⁴ See «Mergers and Acquisitions» – European Economy – Supplement A, Economic trends, n°5/6 – 2000.

⁵ BIS, « Report on Consolidation in the financial sector », January 2001.

entity loses its distinct identity. An acquisition is often considered as a transaction where one firm purchases a controlling stake of another firm without combining the assets of the firms involved. In our analysis, we include transactions with majority interests in order to account for operations that have created a change in capital control. Moreover, only completed operations are considered.

The M&As are classified according to their specialisation or diversification along the dimensions of geography and activity⁶. According to our approach, four consolidation scenarios can be obtained for each type of operation: (1) operations with specialised activity (SPEC) and geographic focusing (GEOF), noted SPEC&GEOF; (2) operations with activity diversification (DIV) and with geographic focusing noted DIV& GEOF⁷; (3) operations with specialisation and with geographic European diversification (GEOD) noted SPEC& GEOD; (4) operations with cross-products diversification and geographic diversification noted DIV& GEOD. Table 1 presents the sample composition for the 13 European countries considered in our analysis.

⁶ The SDC-M&A database is based on an American classification of companies in all branches of industry (Standard Industrial Classification (SIC)) and obeys to the US regulation requirements. SDC-M&A partitions the financial sector into three industries: the banking industry (banking), the insurance industry (insurance) and investment businesses and financial companies (securities and others). In order to homogenise our study, we selected the banking firms as they were reported by SDC that is, the general classification «Commercial Banks, Bank Holding Companies» and, more particularly, the following codification: code 6000 (Bank, non US-chartered) and code 6029 (Commercial Bank, net).

⁷ We considered in this group the transactions between a bank (code 6000 and 6029) and a securities firm or an insurance firm at the domestic level only.

Table 1. M&As deals by country

	DIV&GEOF	SPEC&GEOF	DIV&GEOD	SPEC&GEOD	Total
Germany	9	5	6	1	21
Austria	1	2	1	0	4
belgium	1	3	1	1	6
Denmark	1	0	1	0	2
Spain	2	4	1	0	7
France	17	9	7	1	34
Greece	0	4	0	0	4
Ireland	0	0	2	0	2
Italy	17	27	0	0	44
Netherlands	0	1	3	1	5
Portugal	1	3	2	0	6
Switzreland	6	8	4	0	18
UK	19	2	3	3	27
Total	74	68	31	7	180

Source: SDC – M&A.

A higher number of institutions involved in deals for France, Germany, Italy, Switzerland and the United Kingdom. Cross-border M&As (GEOD) are relatively limited and the number of domestic transactions with cross-product diversification is approximately the same as those with specialisation.

III. ESTIMATING ABNORMAL RETURNS

Event study methodology

We use event study methodology to estimate abnormal stock market returns. Traditionally, the standard market model is used to calculate an abnormal return (AR) for firm i on D day. This methodology suffers from the drawback of assuming a constant beta over the estimation period. The consequence may be to reject the null hypothesis (no abnormal returns) too often due to unspecified beta variability. Here, we employ a methodology developed by Frame & Lastrapes [1998], using a Bivariate GARCH that allows for some beta movements,

$$r_{it} = a_{i1} + a_{i2} r_{i,t-1} + u_{it} \quad (1)$$

$$r_{mt} = a_{m1} + a_{m2} r_{m,t-1} + u_{mt} \quad (2)$$

$$h_{iit} = c_{i1} + c_{i2} u_{i,t-1}^2 + c_{i3} h_{i,t-1} \quad (3)$$

$$h_{mmt} = c_{m1} + c_{m2} u_{m,t-1}^2 + c_{m3} h_{m,t-1} \quad (4)$$

$$h_{imt} = c_{im} \sqrt{h_{iit} \cdot h_{mmt}} \quad (5)$$

where $r_{i,t}$ and $r_{m,t}$ are the expected returns on security i and market benchmark (Datastream General Market Index). Equations (1) and (2) define the average returns on security i and market index. Equations (3) and (4) define the conditional variances of r_i and r_m . Equation (5) defines the conditional covariance. The optimised log likelihood function is:

$$\text{Log } L_t = -0.5 \text{Log } |H_t| - 0.5 u'_t H_t^{-1} u_t \quad (6)$$

where $|H_t|$ is the determinant of the matrix H_t with $H_t = \begin{bmatrix} h_{iit} & h_{imt} \\ h_{imt} & h_{mmt} \end{bmatrix}$, and $u'_t = [u_{it}, u_{mt}]$.

Equilibrium return $r_{i,T+k}^*$ of asset i at time $T+k$ of the event window is defined as a function of: (i) the anticipation at time T of beta coefficient, denoted $\beta_{i,T+k}$; (ii) the observed return on the market at time $T+k$, $r_{m,T+k}$:

$$r_{i,T+k}^* = E(r_{i,T+k} | I_T, r_{m,T+k}) = E(r_{i,T+k} | I_T) + \frac{E(h_{imT+k} | I_T)}{E(h_{mmT+k} | I_T)} (r_{m,T+k} - E(r_{m,T+k} | I_T)) \quad (7)$$

where I_T is the information available at time T and $\frac{E(h_{imT+k} | I_T)}{E(h_{mmT+k} | I_T)}$ is expectation about $\beta_{i,T+k}$ at time T .

Abnormal return at time $T+k$ is defined as the difference between the observed return and the equilibrium return:

$$AR_{i,T+k} = r_{i,T+k} - r_{i,T+k}^* \quad (8)$$

and cumulated abnormal returns (CAR) on the event window $[T+1, T+k]$ is:

$$CAR_{i,T+k} = \sum_{j=1}^k AR_{iT+j} \quad (8')$$

For each security, the model (1) to (5) is estimated on a 300 days pre-event window.

Then, cumulative abnormal returns are evaluated over different windows around the event D Day⁸: (i) 4 one-tailed *ex ante* windows: [D - J, D - 1], for J = 7, 15, 30 and 60 (*windows w1 to w4*); (ii) 4 one-tailed *ex post* windows: [D, D + J], for J = 7, 15, 30 and 60 (*windows w5 to w8*); (iii) 4 two-tailed symmetric windows: [D - J, D + J], for J = 7, 15, 30 and 60 (*windows w9 to w12*).

Firstly, cumulated abnormal returns are evaluated for each of these event windows and for each bank *i*. The null that there is no cumulative abnormal returns for the bank *i* over the entire event window ($CAR_{i\ T+k} = 0$) is tested alternatively with a parametric and a non-parametric test. The parametric statistic is $TP_{1i} = \frac{CAR_{i\ T+k}}{\sqrt{\text{Var}(CAR_{i\ T+k} | I_T, \{r_m\})}}$, where $\{r_m\}$ is the observed market return time series on the event windows and $\text{Var}(CAR_{i\ T+k} | I_T, \{r_m\})$ is such that :

$$\begin{aligned} \text{Var}(CAR_{i\ T+k} | I_T, \{r_m\}) &= \sum_{j=1}^k \text{Var}(AR_{i\ T+j} | I_T, \{r_m\}) \\ &+ k(k-1) \text{Var}(\hat{\alpha} | I_T) + \text{Var}(\hat{\beta} | I_T) \sum_{j=1}^k \sum_{\substack{h=1 \\ h \neq j}}^k r_{m\ T+j} \cdot r_{m\ T+h} \\ &+ \text{Cov}(\hat{\alpha}, \hat{\beta} | I_T) \sum_{j=1}^k \sum_{\substack{h=1 \\ h \neq j}}^k (r_{m\ T+j} + r_{m\ T+h}) \end{aligned}$$

Under the null (no abnormal returns), TP_{1i} is asymptotically distributed as a standard normal variable. To carry out a non-parametric test, abnormal returns AR_{it} for each bank *i* are ranked on the event windows. Let rk_{it} be the rank of bank *i* at time *t* among the different abnormal returns of this same bank over the entire event window. The rk_{it} are then cumulated on the *M* days of the chosen event window. The non-parametric statistic test is:

$$TNP_{1i}(M, U) = \frac{\frac{1}{M} \sum_{j=1}^M rk_{i\ U-j+1}}{\sqrt{\frac{1}{T-M+1} \sum_{t=J}^T \left(\frac{1}{M} \sum_{j=1}^J rk_{i\ t-j+1} \right)^2}}$$

where, here, *U* is the upper bound of event window⁹ and *T* is the upper bound of the [1, *T*] estimation window. The right hand side denominator is the standard deviation of the

⁸ Notice that $T = D - J - 1$.

⁹ For windows w_1 to w_4 we get : $M = J$, $U = D - 1$; for w_5 to w_8 we get : $M = J+1$ and $U = D+J$; for w_9 to w_{12} we have : $M = 2J + 1$ and $U = D+J$.

cumulated and standardised ranks as evaluated on estimation windows. Under the null, TNP_{1i} would be standard normal.

Secondly, we test the null that there is no abnormal return for the entire bank sample and over the entire event window. The statistic used is:

$$T_2 = \frac{\overline{SCAR}}{S_{\overline{SCAR}}} = \frac{\frac{1}{N} \sum_{i=1}^N SCAR_{iU}}{\sqrt{\frac{1}{N(N-1)} \sum_{i=1}^N (SCAR_{iU} - \overline{SCAR})^2}}$$

where N is the number of banks in the sample, $SCAR_{iU}$ is the standardised cumulative abnormal return for bank i at the upper bound U of the event window and \overline{SCAR} is the cross section mean of the different $SCAR_{iU}$. Under the null T_2 is asymptotically distributed as a standard normal variable.

Results

Whole results are not reported here. Table 2 resumes T_2 values using various windows and sampling M&A's according to: (i) the status of the entity, target or bidder; (ii) the geographic dimension, with a same or a different geographic area for the two entities; (iii) the activity dimension, with a cross-product diversification or a specialisation. These statistics are presented for both event windows $[-7, +7]$ and $[-15, +15]$ ¹⁰.

According to T_2 statistic values, cumulative abnormal returns are positive and significant for the whole sample. Thus, as a whole, European M&As in banking industry lead to significant increase in overall value. This result is not consistent with the findings of most event studies carried out for the U.S. banking market. Although, TP_1 and TNP_1 statistics show that less than 10% of the deals present, individually, a significant abnormal return. Thus the market expects a value effect only for few M&As.

The various sampling allows us to look at whether the market makes a distinction in the type of deal. Firstly, the tests show a positive and statistically significant abnormal return for the target group. Thus, M&A may be motivated by the desire to replace inefficient management and to improve X-efficiency. This result is consistent with the finding of

¹⁰ We carry out tests for all the windows defined above. In order to simplify the presentation, we present here the results for two windows. However, the results obtain for the windows $[-7, +7]$ and $[-15, +15]$ are robust for all the other ones. Thus tests in Table 2 are representative for all the windows considered. Other tests are available from the author.

Houston and Ryngaert [1994] and DeLong [2001] for American banks, and Cybo-Ottone and Murgia [2000] for European banks.

Table 2. Significance of abnormal returns

Sample	Event window	T2 value	Number of significant TP1		Number of significant TNP1	
			Positive	Negative	Positive	Negative
Full sample N = 180	[-7, +7]	2.412*	13	2	12	3
	[-15, +15]	2.624*	9	2	7	3
Target N = 29	[-7, +7]	1.995*	7	1	3	1
	[-15, +15]	1.973*	4	0	3	1
Bidder N = 151	[-7, +7]	1.567	6	1	9	2
	[-15, +15]	1.887	5	2	4	2
Deals with geographic diversification N = 38	[-7, +7]	0.26	0	0	1	0
	[-15, +15]	-0.374	0	0	1	0
Deals with geographic specialisation N = 142	[-7, +7]	2.491*	13	2	11	3
	[-15, +15]	3.067*	9	2	6	3
Deals with activity diversification N = 105	[-7, +7]	2.058*	6	0	7	0
	[-15, +15]	2.672*	6	0	4	0
Deals with activity specialisation N = 75	[-7, +7]	1.423	7	2	5	3
	[-15, +15]	1.225	3	2	3	3

* significant at the 5% level

Secondly, our results show that the market reacts positively to M&As with geographic specialisation, suggesting that the market expects benefits such as reduced costs. Another interpretation of this result is that such M&As could be expected to take advantage of market power. By focusing on a particular market, merging banks could take advantage of monopolistic or oligopolistic rents. Our finding is consistent with this of Delong ([2001a], [2001b]) and Cybo-Ottone and Murgia [2000].

Thirdly, the cross-products diversification deals capture positive expectations from the market. This result suggests that scope economies and/or a positive effect of the risk diversification are expected when a bank engages in multiple products activity. Note that these results are different from those obtained on American banks. Delong ([2001a], [2001b]) shows evidence that the market reacts negatively to the announcements of M&As with activity diversification. However, we have to remember that the universal banking principle that characterizes Europe implies that there are no stringent limits to product market diversification from commercial banking into investment banking and insurance. The US legislation during the period under study has been more restrictive both on cross ownership and cross selling between banking and insurance or investment firms. In this respect, the US diversification cannot be compared to the European one.

With the aim of explaining the probability of abnormal returns occurrence, we further explore our data set by crossing variables. Due to the number of combined variables, a Probit estimation is used.

IV. PROBIT ANALYSIS OF DEAL TYPE AND ABNORMAL RETURNS

We examine the link between the occurrence of abnormal returns for bank i on the event window and some features of the M&As. We estimate a standard Probit model:

$$Y_i = \alpha + \sum_{j=1}^J \beta_j X_{ji} + \varepsilon_i \quad (9)$$

where Y_i is a binary variable that takes value 1 if the event (abnormal return) occurs or 0 if not and X_{ji} is a characteristic feature of the transaction entered into by the bank i . Four binary explained variables are alternatively introduced according to: (1) the statistics TP_{1i} or TNP_{1i} (parametric or non-parametric) used to test the null; (2) the sign, positive or negative, of CAR_i :

- . $P_CAR_P = 1$ if the *parametric test* TP_{1i} establishes at least one *positive* and significant CAR_i event window among the twelve defined above (w_1 to w_{12}), and 0 otherwise,
- . $P_CAR_N = 1$ if the *parametric test* TP_{1i} establishes at least one *negative* and significant CAR_i event window among the twelve,
- . $NP_CAR_P = 1$ if the *non-parametric test* TNP_{1i} establishes at least one *positive* and significant CAR_i event window among the twelve,
- . $NP_CAR_N = 1$ if the *non-parametric test* TNP_{1i} establishes at least one *negative* and significant CAR_i event window among the twelve.

The standard Probit model is estimated with a set of explanatory variables that handle with the previous characteristics of the M&As:

- 1/ The status of the entity: $BID = 1$ if the bank is a bidder, 0 otherwise; $TAR = 1$ if the bank is a target, 0 otherwise,
- 2/ The geographical dimension: $GEOD = 1$ if M&As involve a geographical diversification, 0 otherwise; $GEOF = 1$ if M&As imply a geographic focus, 0 otherwise,
- 3/ Specialisation or the cross-products diversification: $SPEC = 1$ if the operation involves an activity focusing, 0 otherwise; $DIV = 1$ if the operation involves a cross-products diversification, 0 otherwise,

and on an extended set of potentially explanatory variables:

- 4/ If M&As involves cross product diversifying, it may be useful to state precisely the non banking operator's activity: $INS = 1$ if the operation concerns a bank and an insurance service, 0 otherwise; $SEC = 1$ if the operation concerns a bank and a securities firm, 0 otherwise,
- 5/ Composite dummies are built on the basis of the previous variables: the product $DIV*GEOF$ allows for the specific influence of diversifying activities *with* geographic focusing on positive or negative CAR_i probability; in such a manner, a lot of composite dummies which cannot be listed here are constructed and added to the set of explanatory variables¹¹,
- 6/ The size control variable ($SIZE$), defined as the ratio of market capitalisation of security i to the global market capitalisation at the event date.
- 7/ Dummy variables are introduced to look for the presence of country effects.

¹¹ $TAR*INS$ for example, indicates a deal where the bank is a target and where the bidder is an insurance company.

The optimal subset of explanatory variables in Table 3 is selected through a standard *stepwise* procedure: after selecting a first explaining variable, the other ones are progressively introduced in the adjustment on the basis of a maximum t-stat criterium. Then, if the introduction of this additional variable induces the non significativity (at 5% traditional level) of an already present variable, this one is expelled from the adjustment. Significant variables are linked to the probability of having a positive or a negative abnormal return. These results complement those previously obtained in Table 2.

Table 3. Explaining the probability of Cumulated Abnormal Return ^a

<u>Parametric statistic based</u> binary explained variable					
Variable	P(obtain a positive CAR _i)		Variable	P(obtain a negative CAR _i)	
	P_CAR_P			P_CAR_N	
	$\hat{\beta}$	z-stat (Prob)		$\hat{\beta}$	z-stat (Prob)
TAR	0.647	2.490* (0.013)	DIV*GEOF	- 0.971	- 2.901** (0.004)
<u>Non Parametric statistic based</u> binary explained variable					
Variable	P(obtain a positive CAR _i)		Variable	P(obtain a negative CAR _i)	
	NP_CAR_P			NP_CAR_N	
Variable	P(obtain a positive CAR _i)		Variable	P(obtain a negative CAR _i)	
	$\hat{\beta}$	z-stat (Prob)		$\hat{\beta}$	z-stat (Prob)
SIZE	- 0.135	- 2.133* (0.033)	TAR*GEOF	- 0.703	-2.061* (0.039)

*a: Potential explanatory variables are: TAR, GEOD, DIV, SIZE, ASS, SEC, DIV*GEOD, SPEC*GEOF, DIV*GEOD, SPEC*GEOF, TAR*GEOD, TAR*GEOF, TAR*DIV, TAR*SPEC, TAR*GEOF*DIV, TAR*GEOF*SPEC, TAR*GEOD*DIV, TAR*GEOD*SPEC, TAR*INS, TAR*SEC, and the country dummies. The composite dummies with BID are not introduced because BID is not significant in the estimation with only the elementary variables.. * represents significance at the 5% level and ** represents significance at the 1% level.*

Firstly, our finding suggests that positive CAR_i probability increases if bank i is a target. This result is consistent with the tests of Table 2 which show that a large share of our target sample present a positive and significant abnormal return.

Secondly, we were expecting a positive and significant coefficient for the deals with cross-product diversification and geographic specialisation. In fact, we find on average a positive abnormal return for these ones (see Table 2). The Probit estimation shows that the combination of activity diversification *and* geographic specialisation *decreases* the probability of having a *negative* abnormal return. Thus, this conjunction may reduce the probability to destroy value.

Thirdly, we find also that the combination of the two criteria «target» *and* « geographic focusing » decreases the probability of having a negative abnormal return.

Fourthly, according to the "*too-big-to-fail*" (TBTF) argument, governments would decide that major banks are so vital they are not allowed to fail. If this argument is true, these banks would have an incentive to increase their riskiness so as to take advantage of higher expected returns; therefore, the larger the institution, the higher should be the abnormal return upon the merger announcement. Our finding doesn't support the TBTF argument: the probability of having a positive abnormal return decreases with the size of the bank. This result is consistent with that of DeLong [2001]. Fifthly, there are no country effects. The set of country dummies is not significant.

V THE EFFECTS OF M&AS ON BETA MARKET RISK

Diversification and risk

The process of consolidation in Europe may have implications for both individual bank risk and the stability of the financial system as a whole, at domestic and European levels. In the debate on risk diversification motive for bank M&As, some argue that there is a potential reduction in risk resulting from diversification in securities and insurance activities. Greater diversification provides value by stabilizing returns. Lower volatility may raise shareholder wealth in several ways. Firstly, the expected value of bankruptcy costs may be reduced¹². By lowering the volatility of a bank's value, diversification could reduce the expected risk of failure and thereby reduce the expected costs associated with bankruptcy. Secondly, greater diversification would allow banks to adopt a higher-revenue product mix (for example by increasing the ratio of securities to loans in the asset portfolio) without the market requiring additional capital or higher interest rates on uninsured liabilities, thereby improving

¹² Bankruptcy costs include both the direct costs of legal, accounting and administrative fees as well as the indirect costs of lower sales, worse terms for purchasing supplies or obtaining credit, reduced employee morale, and other opportunity costs. Scott [1981] and James [1991] provide an overview of the costs of a bankruptcy.

profitability¹³ (Akhavain, Berger and Humphrey [1997] and Berger [1998]). Thirdly, the smoothing of earnings could reduce the need for external funds. These are more expensive than internal ones for several reasons, including transaction costs and asymmetric information between the borrower and the lender. The more volatile the earnings, the more often the bank must seek external funding, so the more often the bank may forego certain projects that would create value (Santomero [1995] and Houston, James and Marcus [1997]). Smoother earnings therefore allow a bank to use internal funding more often and thereby increase value by engaging in more positive net present value projects.

There is, however, a drawback to lowering the volatility of earnings (see Berger and Ofek [1995], DeLong [2001b]). Banks relying less on external funds suffer from insufficient external oversight. Diversified institutions could use healthy segments to assist those incurring losses¹⁴. The consequences could be an increase in the risk of failure and a transfer of wealth from stockholders to bondholders¹⁵.

The risk exposure of banks may increase with diversification for two other reasons. Firstly, combining traditional loan activity and nontraditional securities underwriting may imply a conflict of interest between banks manager and market investors. Banks may have conflict of interest in that they may have an incentive to use their private information obtained from monitoring loans to underwrite poor quality firms and then use the proceeds to repay outstanding loans that the firm has at the bank. If banks indulged in such behaviour this would mean that they systematically abused investors by underwriting poor quality securities (see Rajan [1991] and Kanatas and Qi [1998]). The consequences of combining loans and underwriting securities may be a decrease in bank reputation and an increase in bank failure risk¹⁶. However, if market discipline operates, banks could not fool investors for long

¹³ This is an argument in favour of a move towards universal banking. See Saunders and Walters [1994], Benston et al. [1995] and Demsetz and Strahan [1997].

¹⁴ Meyer et al. [1992] and Scharfstein and Stein [2000] show how cross-subsidization can create inefficient investment spending.

¹⁵ A reduction in volatility could allow stronger departments to subsidize weaker ones (bad loans for example). As bondholders receive payment in more states of the world, the value of their bonds increases. If the value of the banks does not increase, this wealth increase for bondholders comes at the expense of the stockholders.

¹⁶ Empirical research on the conflicts of interest associated with commercial banks' securities activities has not uncovered strong evidence supporting the claim that banks do exploit these conflicts. For studies before the Glass-Steagall Act, see Kroszner and Rajan [1994], Ang and Richardson [1994] and Puri [1996b]. Their findings indicate that commercial banks underwrote higher quality securities, which performed better than identical securities brought to the market by investment banks. In the modern banking system, Gande, Puri, Saunders and Walter [1996] study conflicts of interest in the American banking system by comparing the bond underwritten by commercial banks' section 20 affiliates with those underwritten by investment banks. Their results suggest that commercial bank's certification role, net of conflict of interest, is more valuable than investment banks'.

(Puri [1996a]). Secondly, when M&As combine banking and insurance, i.e. *bancassurance*, conflicts of interest could emerge between bank managers and shareholders. Banks may use insurance companies' equities to satisfy the capital adequacy requirement¹⁷. In this case, the use of equities, by banks and insurance companies, is double. The risk is that banks and insurance companies are in trouble in the same time, without the possibility for both institutions to cover losses with equities. The entire financial group is vulnerable to the failure of its least regulated subsidiary. Because managerial strategies in conglomerates are designed to escape controls, the feared vulnerability is not exogenous but due to moral hazard induced by deliberate behaviour.

Stock prices reflect the types of risks a bank takes through its various activities. In assessing the impact of diversification on the market risk, we test for beta stability between *ex ante* and *ex post* event windows.

Beta stability test

Beta's time series β_{it} are computed for each of these two windows using the Bivariate Garch model (1) to (5).

GARCH coefficients are used to create conditional variance and covariance time series of returns for each bank i and for the market index over the window $[D-h, D+h]$, where D is the event day. Reminding on the one hand that $h_{ii t}$, $h_{mm t}$ are the conditional variances of R_{it} and R_{mt} respectively and, on the other hand, that $h_{im t}$ is the conditional covariance of R_{it} and R_{mt} , we are allowed to specify β_{it} as:

$$\beta_{it} = \frac{h_{imt}}{h_{mmt}}$$

For each bank i , we use a t-statistic to test for the equality of the means of β_{it} over *ex ante* and *ex post* event windows. We avoid the presumed perturbing effect of the nearest data around the announcement D day by excluding these ones for the estimation of *ex ante* and *ex post* means of β_{it} .

¹⁷ Banks and insurance firms respond to different supervisory authorities, and insurance firms are less regulated than traditional banks. Because of the disparities in regulation, the M&As that combine banks and insurance (financial conglomerates) have powerful incentives to rely on regulatory arbitrage. Internal relations between component entities magnify risk in many way: opacity of multiple accounting, excessive exposure between group members and intra-group contagion from credit lines, guarantees, swap...

Tests are carried out for each bank over the windows [D-130, D-30] and [D+30, D+130]. The t-statistics show an increase in the market risk for 50 banks, a decrease for 65 banks, and a stability of the beta for 65 banks¹⁸.

We use a Probit approach to identify the variables that may operate on beta instability probability. There are two binary explained variables:

- Increase = 1 if the beta-market risk increases and 0 otherwise,
- Decrease = 1 if the beta-market risk decreases and 0 otherwise,

We use here the same set of potentially explanatory variables as those used when investigating for the probability of abnormal return. The optimal subset of explanatory variables is selected through a standard stepwise procedure. Results are summarised in Table 4.

Table 4. Explaining the probability of beta instability with an extended set of explanatory variables^a

Variable	P (Increase of β_{it})		Variable	P (Decrease of β_{it})	
	$\hat{\beta}$	z-stat		$\hat{\beta}$	z-stat
INS	1.181	3.116* (0.002)	No significant variables		

*a: We introduce in the estimation TAR, GEOD, DIV, SIZE, TAR*GEOD, TAR*GEOF, TAR*DIV, TAR*SPEC, TAR*GEOF*DIV, TAR*GEOF*SPEC, TAR*GEOD*DIV, TAR*GEOD*SPEC, TAR*INS, TAR*SEC.*

** represents significance at the 5% level.*

The probability of a rise in the market risk increases if the bank diversifies its activity in insurance. Thus, our finding suggests that there is no potential diversification benefits from any synergistic gain for the deals with insurance diversification. On the contrary the market expects «bancassurance» to increase the risk exposure of a bank. This finding is not consistent with that of Molyneux [1998]. This author adopts a merger simulation framework between banks and life insurance in the United Kingdom market over the period 1988-1992. He finds no evidence of risk-increasing for the bancassurance strategy but some evidence that these mergers could be generate significant risk-reduction. However, this risk-reduction effect was

¹⁸ These statistics are not reported to economise on space. They are available from the authors upon request.

shown to be at the expense of profitability. On the contrary, our results suggest that the market expects an increase of the risk exposure for the bancassurance deals, but also an increase of the wealth (see table 2). Thus the bancassurance operations may have a positive effect on the risk-return trade-off of the shareholders.

Concerning the stability of the financial system, our finding is consistent with the debate about the problem of the double use of the equities by banks and insurance companies in order to satisfy the capital adequacy requirement. The risk of failure may increase if both banks and insurance companies are in trouble. The problem of the regulation of the complex financial conglomerate is a current debate. The Banking Advisory Committee and the Banking Supervisory Committee (for the EU countries) think about a new approach for supervising these firms, based on reinforcement of the prudential regulation and on an increase of market discipline.

An other result is that the M&As that combine banks and securities firms do not increase the market risk exposure for the European banking system.

Eventually, the «SIZE» variable introduced to capture the too-big-to-fail argument is not significant. This result is consistent with the one obtained in Table 3 and does not support the TBTF hypothesis.

VI. SUMMARY AND CONCLUSIONS

This study examines stock market reactions in terms of changes in expected returns and risk to bank M&As that were announced between 1991 and 2001 in 13 European countries. A Bivariate GARCH model, which relies on the joint density of individual and market returns, is used to construct abnormal returns. M&As were divided into several groups depending upon activity and geographic specialisation or diversification.

Our results show that there is, on average, a positive and significant increase in value for target banks. Moreover, we find that the market does distinguish among various types of M&As. On average there is a positive and significant market reaction for the two following type of transactions: cross-product diversification and geographic specialisation. On the contrary, M&As with focused activity and geographic diversification did not gain a positive market's expectation. A Probit estimation is used to further explore our dataset by crossing the criteria of M&As classification. From this we find that the combination of activity diversification and geographic specialisation decreases the probability of having a negative abnormal return.

We further investigated the impact of M&As events in terms of systematic risk. Our results show that the market expects an increase in the risk exposure for the «bancassurance». Betas tend to increase when banks diversify its activity in insurance underwriting. This result is consistent with the choice of European banking supervisory agencies to reinforce the supervision of European financial conglomerates.

REFERENCES

- Akhavein J.D., A.N. Berger and D.B. Humphrey [1997], «The effects of bank megamergers on efficiency and prices: Evidence from the profit function», *Review of Industrial Organisation*, 12, 951-39.
- Ang J. and T. Richardson [1994], «The underwriting experience of commercial bank affiliates prior to the Glass-Steagall Act: A reexamination of evidence for passage of the Act», *Journal of banking and Finance*, 18(2), 352-395.
- Benston G.J., W.C. Hunter and L.D. Wall [1995], «Motivations for bank mergers and acquisitions: Enhancing the deposit insurance put option versus earnings diversification», *Journal of Money Credit and Banking*, 27, 777-788.
- Berger A. [1998], «The efficiency effects of bank mergers and acquisitions: a preliminary look at the 1990s data», in Bank mergers & acquisitions, edited by Amihud Y. and G.M. Miller, Boston, M.A. Kluwer Academic, 79-111.
- Berger P.G. and E. Ofek [1995], «Diversification's effect on firm value», *Journal of Financial Economics*, 37, 39-65.
- Bos T and P. Newbold [1984], «An empirical investigation of the possibility of systematic stochastic risk in the market model», *Journal of Business*, 57, 35-41.
- Boyd J., C. Chang and D. Smith [1998], «Moral hazard under commercial and universal banking», *Journal of Money Credit and Banking*, 30(3).
- Cybo-Ottone A. and M. Murgia [2000], «Mergers and shareholder wealth in European banking», *Journal of Banking and Finance*, 24, 831-859.
- DeLong G.L. [2001a], «Stockholder gains from focusing versus diversifying bank mergers», *Journal of Financial Economics*, 59, 221-252.
- DeLong G.L. [2001b], «Focusing versus diversifying bank mergers: analysis of market reaction and long term performance», WP, *Department of Economic and Finance, City University of New-York, Baruch College*, January.
- Demsetz R. and P. Strahan [1997], «Diversification, size and risk at Bank Holding Companies», *Journal of Money, Credit and Banking*, 29(3), 300-313.

- Fabozzi F.J. and J.C. Francis [1978], «Beta as a random coefficient», *Journal Financial and Quantitative Analysis*, 13, 101-115.
- Frame W.S. and W.D. Lastrapes [1998], «Abnormal returns in the acquisition market: The case of Bank Holding Companies, 1990-1993», *Journal of Financial Services Research*, 14(2), 145-163.
- Gande A., M. Puri, A. Saunders and I. Walter [1996], «Bank underwriting of debt securities: modern evidence», *The Review of Financial Studies*, 10(4), 1175-1202.
- Hannan T.H. and Wolken J.D. [1989], «Returns to bidders and targets in the acquisitions process: evidence from the banking industry», *Journal of Financial Services Research*, 3, 5-16.
- Houston J.F. and M.D. Ryngaert [1994], «The overall gains from large bank mergers», *Journal of Banking and Finance*, 18, 1155-1176.
- Houston J.F., C. James and D. Marcus [1997], «Capital market frictions and the role of internal capital markets in banking», *Journal of financial Economics*, 46, 135-164.
- Hughes J.P., W. Lang, L.J. Mester and C.G. Moon [1999], «The dollars and sense of bank consolidation», *Journal of Banking and Finance*, 23 (2-4), 291-324.
- James C. [1991], «The losses realised in bank failures», *Journal of Finance*, 46, 1223-1242.
- Kanatas G. and J. Qi [1998], «Underwriting by commercial banks: incentive conflicts, scope economies and project quality», *Journal of Money, Credit and Banking*, 30(1), 119-133.
- Kroszner R. and R. Rajan [1994], «Is the Glass-Steagall Act justified? A study of the US experience with universal banking before 1933», *The American Economic Review*, 84(4), 810-832.
- Lang L.H.P. and R.E. Stulz [1994], «Tobin's q, corporate diversification, and firm performance», *Journal of Political Economy*, 102, 1248-1280.
- Meyer M., P. Milgrom and J. Roberts [1992], «Organisational prospects, influence costs, and ownership changes», *Journal of Economics and Management Strategy*, 1, 9-35.
- Park S. [2000], «Effects of the affiliation of banking and commerce on the firm's investment and bank's risk», *Journal of Banking and Finance*, 24(10), 1629-1650.
- Pilloff S.J. and A.M. Santomero [1998], «The value effects of bank mergers and acquisitions», in Aminhud Y., G. Miller (Eds), Bank mergers and acquisitions, *Kluwer Academic Publishers, Boston*, 59-78.
- Puri M. [1996a], «Conflicts of interest, intermediation and the pricing of underwritten securities», *Mimeo, Graduate School of Business, Stanford University*.

- Puri M. [1996b], «Commercial banks in investment banking: conflict of interest or certification role?», *Journal of Financial Economics*, 40(3), 373-401.
- Rajan R. [1991] «Conflict of interest and the separation of commercial and investment banking», *Working Paper, University of Chicago*.
- Santomero A.M. [1995], «Financial risk management: the whys and hows» *Financial Markets, Institutions, and instruments*, 4, 1-14.
- Saunders A. and I. Walter [1994], Universal banking in the United States. What could gain? What could lose?, *Oxford University Press, New-York*.
- Scharfstein D.F. and Stein J.C. [2000], «The dark side of internal capital markets: divisional rent-seeking and inefficient investment», *Journal of Finance*, 55, 2537-2564.
- Scott J. [1981], «The probability of bankruptcy: a comparison of empirical predictions and theoretic model», *Journal of Banking and Finance*, 5, 317-344.