

Dynamic Effects of Mergers and Acquisitions on the Performance of Commercial European Banks

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Abstract In this paper, we have shown that the operations of Mergers and Acquisitions (M&A) are necessary for the growth of banks and for passing to increase the scale of returns. The empirical results have confirmed this affirmation. The time has had a negative effect on efficiency while the dummy M&A variable has had positive effects. The composite mergers-time variable has had positive effects, which means that in the long run the M&A achieve all their aims. Our study, therefore, is the first to analyze the dynamic effects of mergers on bank performance derived from both the acquisition of another bank and time, using panel data methodology, for the period 2005–2013, in a sample of 60 acquire banks, in 17 European countries.

Keywords Performance · Mergers · Dynamic effects · Panel Data

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JEL Classification G15 · G21 · G24**Introduction**

Since the turn of the 1990s, the world has seen a massive movement of Mergers and Acquisitions (M&A). This is due to a lot of reasons. First, there has been a global trend—approved by both developed and developing countries—towards the privatization of public firms. Such privatizations have taken the form of acquisitions via the modality of public offering of sale or tender offer. Second, given the economic expansion experienced by the world in the 1990s, multinational companies—in order to counteract the rise of competition—have been aware that they should be integrated to become more efficient. Third, the succession of financial crises that have enveloped the main financial markets (Asia in 1995 and the global crisis of 2007) have raised an important fact that small businesses have been the most affected and have suffered the heaviest losses. Therefore, these enterprises have attempted new strategies to increase their sizes, such as the M&A.

This general context, characterized by the succession of financial crises, has had several effects on the behaviour of the commercial banks in the EU. To face these negative effects, a large portion of banks have had recourse to the M&A to make their size bigger and to get increasing returns of scales. Thus, in the present paper we will try to answer the following question: What are the dynamic effects of the M&A on the bank performance? So to respond to this problematic, we will see in the second section the literature review explaining the main mechanisms through which the M&A can transmit the realisation of performance. The third section presents the model and the data. The fourth one will be reserved to interpret the principal results of econometric estimation. The fifth and last section will conclude the paper.

General Context and Literature Review

Banks are looking for an optimal positioning of their activities on the market for converging to an optimal size. This explains their recourse to the M&A to converge at that size. Thus, it seems that the M&A is a form of alliances to raise the market share of banks subject to the M&A. In this context, Chaffai and Dietsch (1999) noted that the M&A enable banks to reduce their costs and improve their efficiencies at the allocative and productive levels. This research is often defended in the literature in the context of industrial economy.¹

Indeed, according to the industrial economy theory, it is often assumed that the size is strongly linked to economies of scale. Actually, the size increase involves a lower unit cost due to the decrease in the mean fixed cost. In fact, according to Dietsch (1992), Chaffai (1998), Chaffai and Dietsch (1999), Chaffai and Dietsch (2000), and Sassenou (1992), there exists only a critical size which can minimize the unit production costs.

On the other hand, it is important to note that the voluntary nature of the M&A makes them more acceptable to the employed staff. The employees' support for the

¹ It is the work of Sassenou (1992), Chaffai, Dietsch (2000), Dietsch (1992), and Bhavsar (1973).

M&A operations allows enhancing the labour productivity and overall efficiency. Consequently, taking into account the expected positive theoretical effects of the M&A recorded over the past two decades, the European banking sector has undergone several structural changes that have led to the following:

- The concentration of a large number of M&A and increased cross-shareholdings
- The rise of credits of monitoring systems
- The creation of a single financial market in the EU, where small banks have increased their assets by improving their sizes

Hence, considering the importance of the M&A on the strategic plan of banks, we have noticed, since the turn of the 1980s, an increased movement of bank concentrations involving first the USA and later the European area. As an illustration, we have noticed that the number of M&A between financial entities in Europe grew up from 330 in 1990 to 1072 in 2000, whereas the number of M&A of credit entities increased from 97 in 1990 to 269 in 2000 (Thompson One banker). The speed of this movement has been accelerated, so the M&A has become a global phenomenon.

The aim of our empirical study is to detect the effect of the M&A on the performance of banks as well as on their sizes. Also, we will try to know to what extent the M&A could change the nature of banks, returns to scale. Our empirical methodology is based mainly on the work of Dickerson et al. (1997), who tried to detect the impact of M&A on the performance of UK companies (through the use of Panel data). Our research analysed the dynamic effects of M&A on the financial acquire performance of European commercial banks.

It is important to recall that most previous studies have focused primarily on US companies. However, the studies on the banking sector of the European Union are relatively rare. Among these works, we can refer to that of Chaffai and Dietsch (2000), who addressed the issue of the relationship between size and performance—via a comparison of the efficiency index according to the criterion of size. The authors showed an increase in the acquirers' long-term profitability (Diaz et al. 2004).

Literature Review on M&A/Banking Relation Efficiency

As already mentioned in the previous sections, the literature review on the relationship between the M&A and banking efficiency is relatively abundant, at least from the 1990s. Therefore, we will present in this section the main researches that have examined the said question. In the last decade, many studies have been published on M&A in the banking sector and post-merger performance. Some scientists have investigated the issue, using different approaches and arriving at various conclusions. The literature in this field can be divided into two important components (Aggarwal et al. 2006). The first part explains although the gains from M&A are based on the economy of scale and the efficiency generated by another bank merger. The second explains the benefit of shareholder wealth. We examine here the studies that focus on analysing gains in profitability due to M&A and determine the dynamic effect (composite effect between time and M&A) of the banking sector in the European Union.

Al-Khasawneh and Essaddam (2012) studied a sample of 309 bank mergers in the USA from 1992 to 2003 and found that the merger between the less efficient entities and the target created significant returns on the market after the M&A, whereas the mergers between the less efficient entities and the efficient target decreased the performance. In addition, technical efficiency and geographical diversification of entities provided a positive impact on the value of the new entities after the M&A; actually, cross-border acquisition gives more opportunity for bidders to access and to better manage the new markets and invest new resources acquired from targets.

Beccalli and Frantz (2013) examined the impact of the M&A on the performance of banks. To achieve their aims, the authors used a sample of 714 transactions involving acquirers and targets located around the world during the 1991–2005 period. They found that the operations of the M&A are associated with a slight deterioration in return on equity, return on cash flow and profit efficiency and with a significant improvement in cost efficiency.

Tsangarakis et al. (2013) examined the effects of the M&A on the wealth of shareholders and the signals' intra-industry in the European financial sector covering the period between 2000 and 2006. They showed that the announcement of the European mergers and acquisitions transmitted some intra-industry signals that could encourage or discourage the future takeover of offers through the revaluation of other similar European financial institutions that were regarded as rival financial institutions or potential targets.

Simpson (2015) studied a large number of mergers banks, from 1990 to 2007, to analyse the characteristics of income targets and acquirers to identify indicators that would distinguish the income structure of the acquirer of a target. He concluded that acquirers and targets were indeed different characteristics of revenues, cost and efficiency.

Research conducted in many countries shows that M&A contribute to bank efficiency and stockholder value; thus, similar conclusions as reported by Pathan (2009) and Kaplan and Minton (2012) studied a sample of 212 large US banks in 1997–2004. They found that the size of the bank's board of directors was negatively related to risk taking. In addition, Bertrand and Betschinger (2012) studied more than 600 Russian acquisitions involving more than 2000 companies that took place between 1999 and 2008. They found that the impact of the M&A on a company's value was negative, caused by some reasons as agency problems and integration cost. However, Chronopoulos et al. (2013) examined the determinants of profitability for a large sample of US banks from 1984 to 2010. They concluded that the competitive process reduced the abnormal return and regulatory changes in the 1990s, which affected both level and persistence of bank profitability, as the 2007–2010 financial crisis led to an increase in the persistence of bank profitability. Nevertheless, Devos et al. (2009) tried to test if the M&A allows tax benefits and an increase on the market power to identify the causes of the creation of the value related to the M&A. Goddard et al. (2012) examined a sample of 132 M&A of banks in Asia and Latin America from 1998 to 2009. They concluded that banks benefit when they buy profitable target banks. Also, the bidder banks benefit on receiving cash benefits because cash acquisitions are generally more expensive. Khalid et al. (2011) reported a negative correlation between the Chief Executive Officer (CEO) and the performance of banks in Pakistan. Accordingly, it can be argued that the performance indicators are more negative when companies drop the two structures.

Empirical evidence for the gain of mergers and acquisitions in the European banking system is not the same. Asimakopoulos and Athanasoglou (2013) studied a sample of 170 banks in the European Union from 1990 to 2004. They found that the M&A played a more significant role in the banking sector and the technological development just after the financial market globalization, the introduction of the euro and the establishment of a single financial market in the European Union.

Hernando et al. (2009) showed that the cross-border banking business in Europe remained rather limited till the integration of the euro as the official currency of the euro zone. The European banking sector has undergone significant changes in its structure and culture and hired a lot of M&A in the last 20 years.

Beltratti and Paladino (2013) used a sample of transactions realised by European customers from 2007 to 2010. They found that there were no significant abnormal returns in the moment of announcing an acquisition. Hoberg and Phillips (2010) considered that the realization of synergies was the main motivation for implementing a merger or an acquisition.

Several other researches do not converge to the same results from mergers and acquisitions on performance. Sherman (2010) argued that the M&A are one of the most effective ways to accelerate the implementation of a rapid growth plan. The technology has accelerated the pace of the M&A. Rani et al. (2014) and Chronopoulos et al. (2013) found that the M&A had a positive impact on the performance of banks. In addition, El-Chaarani (2014) examined the impact of corporate governance on the financial performance of Lebanese banks, from 2006 to 2010, based on 182 observations. He concluded that there firstly existed a positive impact of independent administrative advice on the performance of Lebanese banks and secondly a significant and negative relationship between the quality of the CEO and the bank performance. However, Bertrand and Betschinger (2012), Akben-Selcuk and Altiok-Yilmaz (2011), and Behr and Heid (2011) concluded that the M&A had a negative impact on the performance of banks. Healy and Palepu (2012) suggested that the impact of the M&A on the value of the tendering company was negative. Asimakopoulos and Athanasoglou (2013), Marimuthu and Ibrahim (2013), and Castellet and Fernandez (2005) argued that the M&A would not have a significant impact on the performance of banks. In addition, Hagendorff and Nieto (2013) observed a return to the average profitability ratios, capitalization and liquidity analysed in the context of long-term financial performances of the entities involved in the process of the M&A. They also concluded that the M&A banks had an insignificant impact on the safety and soundness of banks involved in a deal. On the other hand, Lozano-Vivas et al. (2011) deduced that the cost effectiveness was more observable in foreign M&A and that the cost reduction was achieved 5 years after the M&A. Lensink and Maslennikova (2008), Goddard et al. (2012), Al-Khasawneh and Essaddam (2012), Beltratti and Paladino (2013), and Asimakopoulos and Athanasoglou (2013) tried to show that the best approach to be used for the evaluation of the post-M&A performance was to make use of the stock analysis. However, Altunbas and Marques (2008), Rezitis (2008), Bernad et al. (2010), Egger and Hahn (2010), Behr and Heid (2011), and Halkos and Tzeremes (2013) supported the use of accounting study to analyse the performance of banks after the operation of M&A.

Based on our literature survey, it is clear that there is no study of European banking focus on the dynamic effect of mergers and acquisitions on bank performance (composite effect of time, and M&A).

Empirical Analysis: Definition of Variables and Methodology Research

The empirical analysis is conducted on a sample covering 60 commercial banks from 17 countries of the European Union which underwent M&A during the period that stretched from 2005 to 2013. The data were collected from the Bankscope databases (see Appendix Table 4). At this stage of analysis, it is important to note that our sample selection criteria are three in number. First, the choice of the Euro area banks is explained by the relative frequency of the M&A in the said area, which makes it a fertile field and preferred analysis. However, in other geographical areas, the M&A are accidental and relatively rare. Second, despite that, there were M&A in the off-Euro zone (before 2005) we have omitted, to have a capacity of a panel data structure. Third, to save a sample with heterogeneities, we have used banks operating in the Euro zone where the said banks faced almost identical regulatory and legal structures.

Sample and Data

To analyse if there was a permanent change of profitability, post-M&A, in credit entities in the European Union, we will follow the approach of Diaz et al. (2004), Villalonga (2000), and Issaoui (2009), who utilized a methodology similar to the following form.

$$\begin{aligned}
 \text{Profitability}_{it} = & \beta_0 + \beta_1 \text{Profitability}_{it-1} + \beta_2 \text{Gdp}_{it} + \beta_3 \text{Credits}_{it} + \beta_4 \text{Size}_{it} \\
 & + \beta_5 \text{Share}_{it} + \beta_6 \text{Equity}_{it} + \beta_7 \text{Loandep}_{it} + \beta_8 \text{Dep}_{it} \\
 & + \beta_9 \text{Non-interest-income}_{it} + \beta_{10} \text{Time}_{it} + \beta_{11} \text{subp}_{it} + \beta_{12} \text{A}_{it} \\
 & + \alpha_i + \mu_t + \varepsilon_{it}
 \end{aligned} \tag{1}$$

$$i = 1 \dots 60 \quad t = 2005 \dots 2013$$

In our model, we recourse to 60 banks, which were merged or acquired by other entities in the temporal horizon of 9 years. Thus, $i = 1, 2 \dots 60$, and $t = 2005 \dots 2013$. In the error terms $e_{it} = \alpha_i + \varepsilon_{it}$, α_i is the specific effect for each bank, supposed as constant in time, whereas ε_{it} is supposed to be a random perturbation with a form generated by an autoregressive process of order 1. The coefficients $\beta_0 \dots \beta_{11}$ are the parameters to estimate. The coefficient of the lagged dependent variable β_1 measures the degree of persistence and competitiveness, while the coefficients $\beta_2 \dots \beta_9$ measure the influence of the rest of control variables, β_{11} measures the effect of subprime crises, β_{12} measure the effect of mergers and acquisitions and β_{10} measures the coefficient of time variable; it is the time horizon covering the period from 2005 to 2013. Assuming that a bank was subject to M&A in 2007, then in that year, Time is considered as zero. In the pre-M&A period, the value of Time should be negative (Time in 2005 is equal to -2 ; and in 2006, Time is equal to -1). In the post-M&A period, the Time values are positive; for example, in 2008 Time is equal to 1 and in 2009 it equals 2, etc.

Following the approach of Megginson et al. (1994), Villalonga (2000), Alexandre and Charreaux (2004), and Issaoui (2009), we will integrate two other variables to capture the dynamic effects. The first variable is a dummy one (the M&A) which takes the value (1) at the time and after the M&A and the value (0) otherwise. The second variable is a composite one (Time \times M&A) which takes into account both aspects of time and M&A. This composite variable is equal to 0 before the M&A and positive values right after. For example, suppose that the bank was merged in 2007, the value (Time \times M&A) would be zero (Time = 0 and M&A = 1). In 2013, the value of Time \times M&A was equal to 7 (as long as Time = 7 and M&A = 1). In fact, the econometric model can be as follows:

$$\begin{aligned} \text{Profitability}_{it} = & \beta_0 + \beta_1 \text{Profitability}_{it-1} + \beta_2 \text{Gdp}_{it} + \beta_3 \text{Credits}_{it} + \beta_4 \text{Size}_{it} \\ & + \beta_5 \text{Share}_{it} + \beta_6 \text{Equity}_{it} + \beta_7 \text{Loandep}_{it} + \beta_8 \text{Ddep}_{it} \\ & + \beta_9 \text{Non-interest-income}_{it} + \beta_{10} \text{Time}_{it} + \beta_{11} \text{A}_{it} \\ & + \beta_{12} (\text{Time}_{it} \times \text{A}_{it}) + \beta_{13} \text{Subp}_{it} + \alpha_i + \mu_t + \varepsilon_{it} \end{aligned} \quad (2)$$

Thus, the model we will try to estimate is a dynamic model in which one or more lags of the dependent variable are included as delayed explanatory variables. This model contains the lagged dependent variables which are correlated with the error term. The use of the OLS estimator is problematic. Arellano and Bond (1991) developed a generalized method of moment (GMM)-system two-step estimator which gives consistent parameter estimates for models of this type. In their approach, the unobserved entity-specific heterogeneity is eliminated by using a first differencing transformation. This removes the bank-specific effects in Eq. (2).

It is important at this stage of analysis to note that there are two types of GMM estimators: the estimator (Arellano and Bond, 1991), the GMM difference estimator (Blundell and Bond, 1998) or the GMM system. Indeed, the goal of the estimation in a first difference of Arellano and Bond (1991) is to eliminate any bias variables. However, Blundell and Bond (1998) concluded that the GMM estimator was more efficient than the estimator of the GMM in a first difference (using the Monte Carlo simulations). Therefore, there is a convergence taken unanimously by the fact that the GMM estimators in a first difference conduct to biased estimators for small samples.

To overcome this lack of robustness, Blundell and Bond (1998) proposed a GMM system approach. The GMM system returns to stack, for each period, the equation in a difference with the equation at level. This method involves instrumenting the variables of the equation in first differences by their values to a level of at least a period lagged (the same instrument of Arellano and Bond (1991)) and instrumenting the variables at level by the variables in first differences. For the GMM system, we operate two orthogonality conditions for the second part of the system (the regression level).

$$E [(y_{i,t-s} - y_{i,t-s-1}) \cdot (\alpha_i + \varepsilon_{it})] = 0 \quad \text{for } s = 1$$

$$E [(X_{i,t-s} - X_{i,t-s-1}) \cdot (\alpha_i + \varepsilon_{it})] = 0 \text{ for } s = 1$$

The majority of Monte Carlo simulations suggest that the approach in the GMM system improves the accuracy of the estimators and reduces the bias on small samples. Blundell and Bond (1998) found that the estimator of GMM in the system was more efficient than the estimator of GMM in the first difference. Thus, the quality of the GMM depends on both validity of instruments and absence of autocorrelation hypothesis of the second-order error term $E(\Delta\varepsilon_{it}, \Delta\varepsilon_{it-2}) = 0$.

Arellano and Bond (1991) proposed two tests to examine these two hypotheses. The first was the Sargan test of over-identification (subsequently replaced by Hansen test), which was constructed in a similar manner to the cross section test. The test of Sargan (1964) was distributed according to a law of Chi-square degrees of freedom equally to the number of instruments disposed in the second regression. The second test would examine the hypothesis of non-autocorrelation of errors, particularly if there existed an autocorrelation of second-order, differentiated error and an autocorrelation of first-order error term of the regression in difference ($\varepsilon_{it} - \varepsilon_{it-1}$). In fact, we could not use the error terms of the regression level because it included the specific countries “ μ effect.”

Dependent Variables

Following the approach of Diaz et al. (2004), the dependent variable is the economic and financial profitability. Traditional measures of profitability are the return on assets (ROA) and the return on equity (ROE). The ROA is calculated on the average assets of the European commercial bank at the beginning and the end of the year while the ROE is calculated on the average value of equity. However, as long as European countries are not homogeneous in terms of their tax systems (Focarelli and Pozzolo 2001), we have decided, for reasons of clarity and efficiency of estimations, to account for ROA and ROE variables both in the pre-taxation period (before tax) and the post-tax one (net) as well as the adjusted one (gross). Such variables are as follows:

ROA.b.tax and ROE.b.tax are calculated on profit before tax, thus eliminating any possible influence of different tax systems in the results of our analyses (Dickerson et al. 1997).

ROA.adjusted and ROE.adjusted are calculated based on income before taxes plus depreciation and provisions; both eliminate any possible influence of the different depreciation rules in the results of our analysis (Houston et al. (2001)).

Control Variables

Control variables consider third the characteristics of the country of the acquirer, the dynamic effect of Time and acquirer dummy variables and the characteristics of each credit entity. The degree of development of the country of each credit entity is the proxy variable for the natural logarithm of the gross domestic product (GDP) per capita in purchasing power parity, where

- Credits are the size of the banking sector, measured by the ratio of domestic credits to the GDP of the bank (Focarelli and Pozzolo 2001).

- Size is the total assets of the banks, measured by the natural logarithm of total assets.
- Share is the market share; it is the percentage of deposits on total deposits of a country that corresponds to credit entities ($\text{Deposits}_{it}/\sum \text{Deposits}_{it}$).
- Equity is the ratio between the values of equity to total assets.
- Loandep is the loan-deposit ratio, which is used to calculate the ability of credit entities to cover the credits removed from customers (Loandep).
- Deposits are the ratio of total deposits on total assets (Dep).
- The non-interest income over net income measures the percentage of profits from off-balance sheet operations (the non-interest income).

Empirical Findings and Discussion

The lower panel estimation by the two-step system GMM (using STATA) of each table includes some post-estimation tests of autocorrelation and instrumental validity. AR (2) is the Arellano and Bond (1991) tests of second-order autocorrelation in the first difference errors. When the regression errors are independent and identically distributed (i.i.d ~ 1), the first differenced errors are, by construction, autocorrelated. Sargan test (Arellano and Bond 1991) is a test of over-identifying the validity of instruments. For the estimations reported in Table 2, Table 3 indicates that the dynamic panel profitability model is a good specification, because firstly, the AR (2) tests show no evidence of autocorrelation at levels of significance, and secondly, Sargan tests show no evidence of miss-specification at levels. We note that the probability of Hansen test is equal to 1.000 for all models, in Table 2 and Table 3, which confirms the validity of instruments (Table 1).

The results about the European countries are reported in Tables 2 and 3. The value of different lagged variables is positive and significant which implies that ROA.net, ROA.b.tax and ROA.adjusted are corrected respectively by 29.4, 51 and 23.5 percent; ROE.net, ROE.b.tax and ROE.adjusted are corrected respectively by 61.2, 40.6 and 47.1 percent, which means that there is a phenomenon of divergence characterizing the banking system. In addition, the tax regime in the European Union led the banking

Table 1 Descriptive statistics (mean and standard error)

	Mean	Standard error		Mean	Standard error
Roa.net	.0012	.0291	Credits	1.290	.5428
Roe.net	.0283	.3497	Size	9.251	2.411
Roa.adjusted	.0033	.0321	Share	.0429	.06004
Roe.adjusted	.0643	.3511	Equity	.07945	.0739
Roa.b.tax	.0309	.0392	Loandep	.6559	.3945
Roe.b.tax	.08006	.2745	Dep	.7675	.3380
Gdp	10.666	.5387	Non-interest-income	.7945	3.864

Notes: All variables are transformed into natural logarithm. Std error and Mean indicate standard error and mean of all variables. Balanced panel data on one group of countries: European (17 countries), for the period 2005–2013

Table 2 Estimation results for the ROA dependent variable

	ROA.net	ROA.b.tax	ROA.adjusted
ROA (-1)	0.294 (15.62)***	0.278 (14.53)***	0.235 (27.01)***
Gdp	0.007 (5.85)***	0.014 (3.78)***	0.0081 (5.43)***
Credits	-0.005 (-7.83)***	-0.009 (-4.84)***	-0.0062 (-4.03)***
Size	0.0003 (1.41)	0.0005 (1.86)*	0.0003 (0.86)
Share	0.039 (6.62)***	0.044 (8.79)***	0.039 (5.15)***
Equity	-0.021 (-5.85)***	-0.019 (-4.43)***	-0.025 (-2.42)**
Loandep	-0.002 (-2.21)**	-0.0024 (-2.13)**	-0.0029 (-1.87)
Dep	0.0014 (0.58)	0.0033 (1.31)	0.0020 (0.89)
Non-interest income	0.0002 (10.84)***	0.0003 (12.99)***	0.00089 (15.41)***
Time	-0.003 (-4.30)***	-0.0032 (-5.41)***	-0.0028 (-3.98)***
A _i	0.008 (4.12)***	0.007 (3.43)***	0.0061 (2.36)**
Time×A _i	0.003 (4.58)***	0.0022 (1.23)	0.0030 (4.31)***
Sublp	-0.045 (-4.66)***	-0.004 (-3.91)**	-0.0013 (-2.49)**
Const	-0.086 (-6.80)***	-0.162 (-3.70)***	-0.084 (-5.28)***
Hansen	1.000	1.000	1.000
AR (2)	0.311	0.387	0.398
OBS N	479	479	479
			0.240 (30.31)***
			0.007 (3.31)**
			-0.0069 (-4.63)***
			0.00028 (0.84)
			0.0325 (5.35)***
			-0.037 (-5.70)***
			-0.0027 (-2.20)**
			0.0027 (1.37)
			0.00098 (17.96)***
			-0.0032 (-5.10)***
			0.0071 (3.15)**
			0.0034 (5.54)***
			-
			-0.073 (-3.21)**
			1.000
			0.417
			479

Notes: Values in parenthesis are the *t* statistics. Sargan-test refers to the over-identification test for the restrictions in GMM estimation. The AR (2) test is the Arellano–Bond test for the existence of the second-order autocorrelation in first differences. ***, ** and * indicate significance at the 1, 5 and 10 % levels, respectively

Table 3 Estimation results for the ROE dependent variable

	ROE.net	ROE.b.tax	ROE. adjusted
ROE (-1)	0.612 (19.62)**	0.406 (16.98)**	0.471 (15.47)**
GDP	0.073 (3.12)**	0.069 (3.28)**	0.106 (3.74)**
Credits	-0.063 (-3.77)**	-0.070 (-6.36)**	-0.051 (-2.20)**
Size	0.0096 (2.28)**	0.0019 (0.70)	0.014 (3.62)**
Share	0.204 (1.57)**	0.418 (7.42)**	0.288 (3.15)**
Equity	0.344 (3.89)**	0.034 (-0.90)	0.374 (4.33)**
Loandep	-0.0092 (-0.42)	-0.014 (-0.86)	-0.063 (-2.20)**
Dep	-0.00079 (-0.05)	0.0102 (0.44)	0.0088 (0.75)
Non-interest income	0.0043 (5.23)**	0.0023 (7.02)**	0.0061 (10.01)**
Time	-0.059 (-3.49)**	-0.028 (-4.24)**	-0.023 (-1.46)**
A _i	0.135 (2.86)**	0.0831 (2.98)**	0.076 (1.83)*
TimexA _i	-0.045 (3.55)**	0.0284 (4.19)**	0.023 (1.44)
Sublp	-0.045 (-6.41)**	-0.0336 (-8.75)**	-0.055 (10.33)**
Const	-0.927 (-4.06)**	-0.693 (-2.88)**	-1.20 (3.88)**
Hansen	1.000	1.000	1.000
AR (2)	0.265	0.200	0.229
OBS N	479	479	479
			0.488 (19.01)**
			0.145 (5.46)**
			-0.081 (-4.19)**
			0.0145 (4.42)**
			0.204 (2.10)**
			0.374 (4.39)**
			-0.052 (-2.08)**
			0.00037 (0.03)
			0.0068 (11.20)**
			-0.022 (-1.32)
			0.057 (1.29)
			0.023 (1.31)
			-
			-1.61 (-6.08)**
			1.000
			0.216
			479

Notes: Values in parenthesis are the *t* statistics. Sargan-test refers to the over-identification test for the restrictions in GMM estimation. The AR (2) test is the Arellano–Bond test for the existence of the second-order autocorrelation in first differences. ***, ** and * indicate significance at the 1, 5 and 10 % levels, respectively

sector to be more competitive because the lagged ROA.net approaches zero. On the other hand, the M&A operations are assumed to be generating bank concentration, in which the significance and positive sign were obtained for the dummy variable A_{it} for both economic and financial performance for all dependent variables. However, the magnitude of the regression coefficient is higher, since M&A increased ROA.net, ROA.b.tax and ROA.adjusted by 0.8, 1.1 and 0.61 percent, respectively, and ROE.net, ROE.b.tax and ROE.adjusted by 13.5, 8.31 and 7.6 percent, respectively. Moreover, we have noticed that the effect of economic growth (GDP) and the share of the banking market (Share) on the ROA variable (economic performance) are positive and significant, that is, the more the economic times are favorable, the higher the market share is, as the banks managed to improve their performance. Credits, Equity and Loandep variables have exerted significant and negative effects at 1 and 5 %. Therefore, it seems that banks give credits as long as they are less performant. Also, as far as the size of banks is important, they are less performant. This can be explained by the fact that during the selected period, big banks suffered the most negative effects and adverse post-crisis. The M&A effect is positive and significant, which intrinsically means that mergers and acquisitions can improve the performance of the merged entities. The effect of time (Time) is negative and important. This was partly because, during the period chosen in the model, the banking sector suffered the negative effects of the subprime crisis that exploded in 2007. A priori, it is likely that if the choice of the time horizon was different, then there could have a positive effect. The dynamic effect of M&A ($\text{Time} \times \text{M\&A}$) is positive and significant at 1 % for ROA and at 1 and 10 % for ROE. This result can be due to the composite effect of Time and the consolidation characterized by the successful integration system between credit entities in the EU. The dynamic effect is higher for ROE regressions than for ROA regressions, although the magnitude of the coefficient is 5, 2.84 and 2.3 percent for ROE.net, ROE.b.tax and ROE.adjusted, respectively, and 0.3, 0.22 and 0.34 percent for ROA.net, ROA.b.tax and ROA.adjusted, respectively. One moves away from the moment of the M&A provided that the bank performance improves. This result is important as long as it reflects the dynamic effect exerted by M&A on the performance of the acquired entities during the post-M&A period. The subprime crisis had a negative and significant effect at 1 % of the performance of banks. In addition, the size is positive and significant for both economic and financial performance—those explained by the size of individual acquired banks, which have a lower total asset of 100,000 millions of Euros (see Appendix Table 4), and that banking integration in time provides increasing returns to scale. Finally, the coefficient on the variable Dep is small and insignificant, which shows that bank profitability is not always dependent on deposits collected, and the sign of the variable “non-interest income” shows the greater percentage of profits deriving from off-balance-sheet operations. Therefore, most of the gains obtained by the credit entities in the EU still come from non-traditional banking activities.

Conclusion and Policy Implications

In this paper, we can conclude that the European commercial banks have got some gain in efficiency after the M&A banking. Firstly, there is the performance increase through the acquisition of the EU’s financial entities. Therefore, the results obtained in previous

studies only analysed the effect of M&A on profitability in the short and long run; the composite effects of mergers and time on the performance of banks derived from the acquisition of both another bank and time do not need to be extrapolated.

Secondly, M&A have been used in the European banking sector and commercial banks have increased the long-term profitability in terms of ROA and ROE. This can be justified by the universal nature of the banking system in Europe which is specified by many diversifications. Also, we have shown that time has had negative effects on performance. This is due especially to the nature of the temporal horizon that includes the year of subprime. The composite effects of mergers and time, which means that when the merged banks advance from the moment of M&A, it is usually due to their performance; in addition, the static effect appeared for the economic and financial performance.

Appendix

Table 4

Table 4 Data collected from Bankscope databases

Country	Banks that carry out acquisitions	Time of M&A	Mean of total assets (millions of euros)
Portugal	Deutsche Bank (Portugal) SA	2011	337,854,573
Czech Republic	UniCredit Bank Slovakia a.s.	2013	596,484,042
	UniCredit Bank Czech Republic and Slovakia AS	1999/2001/ 2007/2013	228,014,887
Ireland	Ulster Bank Ireland Limited	2010	455,917,478
Latvia	Jsc Latvian Development Financial Institution Altum	1997	61,846,1801
Belguim	Record Bank SA/NV	1995/2005/ 2006	17,413,063
	ING Belgium SA/NV-ING	1975/2003/ 2006/2006	169,886,777
Hungary	Banco Popolare Hungary Bank Zrt	2013	351,661,727
	Calyon Bank Magyarorszag Zrt-Calyon Bank Hungary	2007	141,751,433
	Erste Bank Hungary Nyrt	1996/2004	23,936,655
Germany	Mizuho Corporate Bank (Germany) AG	2009	122,067,299
Finland	Nordea Bank Finland Plc	2000/2001/ 2002	228,979,743
Romania	Intesa Sanpaolo Bank Romania SA	2012	287,081,553
	Banca Comerciala Romana SA-Romanian Commercial Bank SA	1999	636,671,986
Sweden	Nordea Bank Sweden AB (publ)	1994/2002/ 2004	464,942,024
Spain	Banco de Credito Local de Espana	1999/2009	970,107,785

Table 4 (continued)

Country	Banks that carry out acquisitions	Time of M&A	Mean of total assets (millions of euros)
Greece	Emporiki Bank of Greece SA	2013	239,650,671
	Agricultural Bank of Greece	2012	295,173,666
	National Bank of Greece	1998/2002	985,240,813
France	KBL Richelieu Banque Privée	2008	131,614,113
	Banque Saradar France	2005	46,170,964
	Aareal Bank France S.A.	2010	420,443,928
	Banque Audi Saradar France SA	2005	66,114,185
	Credit Suisse (France)	1997	79,179,369
	Banca Intesa (France) SA	2003/2008	204,435,893
	UBS (France) SA	2003	139,490,662
	HSBC France	1917/2002/ 2008/2010	188,257,359
	UK	Citibank International Plc	2000
Clydesdale Bank Plc		2004	40,541,312
Co-operative Bank Plc (The)		2009	451,285,428
Alliance & Leicester Plc		2001/2011	660,584,282
Santander UK Plc		1944/1996	26,987,977
National Westminster Bank Plc—NatWest		1968/1970	339,103,641
Standard Chartered Bank		2008	492,062,152
Bank of Scotland Plc		2001/2007/ 2010	621,453,125
Royal Bank of Scotland Plc (The)		1969	118,726,853
Santander UK Plc		1944/1996	241,004,056
Luxembourg	Hauck & Aufhauser Banquiers Luxembourg SA	2013	473,072,753
	VP Bank (Luxembourg) SA	2001	143,026,418
	Banco Itau Europa Luxembourg	2009	73,442,678
	Kaupthing Bank Luxembourg SA	2009	246,815,533
	Banque Degroof Luxembourg SA	2006	258,766,826
	Credit Agricole Luxembourg SA	1997/1999/ 2005/2008	522,664,993
	Credit Suisse (Luxembourg) SA	2002	466,157,719
	JP Morgan Bank Luxembourg SA	1998	563,106,619
	Dresdner Bank Luxembourg SA	2010	11,242,941
	Landsbanki Luxembourg SA	2008	332,065,662
	Deutsche Bank Luxembourg SA	1999	706,035,022
	UBS (Luxembourg) SA	1996/1998/ 2002	159,870,808
	DekaBank Deutsche Girozentrale Luxembourg SA	2002	883,886,351
	ING Luxembourg	2003	127,880,162
	KBL European Private Bankers SA	2005	162,593,926

Table 4 (continued)

Country	Banks that carry out acquisitions	Time of M&A	Mean of total assets (millions of euros)
	UniCredit Luxembourg SA	1998	274,889,618
	Banque Internationale A Luxembourg SA	2001/2002	432,303,096
	BNP Paribas Luxembourg	2001/2006/ 2007/2010	232,154,344
Austria	Arab Bank (Austria) AG	2006	196,306,682
	Valartis Bank (Austria) AG	2009	797,850,413
	Kommunalkredit Austria AG	2009	907,659,166
	UniCredit Bank Austria AG-Bank Austria	1997/2000/ 2002	179,970,071
Bulgaria	Eurobank Bulgaria AD-Postbank	1998/2002	521,865,437

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