MERGERS AND ACQUISITIONS IN THE SPANISH BANKING INDUSTRY: SOME EMPIRICAL EVIDENCE

Ignacio Fuentes
and Teresa Sastre

Banco de España

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Ignacio Fuentes and Teresa Sastre (*)

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ABSTRACT

Since the late eighties, the Spanish banking system has been undergoing major changes that have affected both its structure and the nature of strategic interaction among banking institutions. Various different strategies have been adopted to tackle the demands of this new operating environment, one such strategy having been consolidation via mergers and acquisitions. This paper attempts to provide some empirical evidence on the impact of the consolidation process on the monetary transmission mechanism, the degree of competition in banking markets and the performance of banking institutions.

The impact on the monetary transmission mechanism is analysed in terms of the estimated impact that mergers and acquisitions may have had on interest rates set by banks. To do this, several equations for bank interest rates have been estimated using panel data for Spanish banks from 1988 to 1997. These equations also provide a test for the effects of increasing competition on bank's borrowing and lending rates.

The impact on the performance of banks is assessed using a case-study approach based on the changes in a set of financial ratios. Analysis of these ratios during the pre- and post-merger periods provides some insights on the effects of mergers and acquisitions on the efficiency, profitability and strength of consolidated institutions.

CONTENTS

I.- INTRODUCTION

Since the late eighties, Spanish bank markets have been undergoing major changes that have affected both their structure and the nature of strategic interaction among Spanish banks. These major changes have been a natural outcome of the heightening competitive pressure exerted on all countries' banks by processes such as deregulation, globalisation of financial and economic activities, the development of new technology and the prospect of the greater integration of European financial markets.

Various different strategies have been adopted by Spanish banks to tackle the demands of this new operating environment with much stiffer competition both from other Spanish and foreign banks and from other financial institutions. One such strategy is consolidation via merger and takeover.

As a result of this process the degree of concentration of the Spanish banking industry has increased and the share in the system's total assets of the ten biggest banking groups grew from almost 50% in 1992 to over 70% in 1998 (see Table 1). This process has also changed the structure of the savings bank and credit co-operative sectors, with significant reductions in the number of institutions -the number of savings banks fell from around 80 in the eighties to 51 in 1997 and the number of credit co-operatives from 150 to 97 in the same period-.

However, this process of concentration has not prevented a growing degree of competition in almost all the relevant segments of the banking product markets. This increase in competition has given rise to a progressive narrowing of the spread between lending and deposit operations, which has moved from levels close to nine points to below four points (see graph 1).

The main purpose of this paper is to provide empirical evidence on the implications of these two processes. It is worth addressing both issues jointly in view of the apparently countervailing effects that the increase in the degree of competition, on one hand, and the potential increase in banks' market power as a result of merger and takeover, on the other, could have on interest rates and on bank profitability.

Mergers and other forms of consolidation may influence bank interest rates insofar as the increase in size and the opportunities for reorganisation involved either may provide gains in efficiency that bear on marginal costs or give rise to increases in market power, or both together. Gains in efficiency would be obtained on moving onto a greater scale of activity (if there are economies of scale[1]) and/or owing to the possible reduction of X-

1 According to some empirical studies on the Spanish banking system (Fanjul and Maravall (1985), Delgado (1989) and Raymond and Repilado (1991), economies of scale have been observed at branch level, but not at firm level.

inefficiencies, derived from inadequate management and organisation of resources that might have placed a bank above its cost curve.

Mergers and acquisitions may give banks the opportunity to re-direct their activity towards business areas that involve an increase in income greater than that in costs, thereby achieving an increase in profitability. Some authors have also pointed to a potential effect on banks' capital adequacy insofar as mergers and acquisitions may allow for a greater diversification of risk with the same capital base[2.]

Faced with this set of possible repercussions, it may well be asked whether the increase in price competition between Spanish banks since the start of the nineties has been checked, to some extent, by the increase in concentration and the potential rise in merged banks' market power. It is also worth evaluating whether merged banks have actually obtained gains in efficiency and, should this be so, whether these have translated into improved profitability and higher levels of soundness.

To analyse these issues two types of methodology will be used in this paper. The first, of an econometric nature, is used to seek the influence of the above-mentioned phenomena on the determination of bank interest rates and is based on the estimation of interest rate equations with panel data. On one hand, this allows prices of merged firms to be compared with those of non-merged ones. On the other, the effect of competition on banks' interest rates can be analysed by using an indicator of their course over time. There are few empirical studies on the effects of competition on banks' interest rates, probably due to the difficulties of defining adequate variables that could be used to measure the degree of competition. The most widely used variable is concentration. However, this variable does not seem appropriate according to recent developments in the Spanish banking system. Instead, the cross-section dispersion of bank interest rates is the indicator used in this paper.

The second methodology, used to assess the impact of mergers on efficiency, profitability and soundness of merged institutions, consists of a case-by-case analysis of most of the mergers and takeovers that have taken place in Spain in the period 1988-1997.

The paper is organised as follows. Section 2 analyses the effects of consolidation and competition on bank interest rates and the transmission mechanism. Section 3 analyses a wide range of variables in order to assess the impact of merger processes on the levels of efficiency, profitability and solvency of merged institutions. Section 4 concludes.

2 See Reboredo (1997).

II.- INFLUENCE ON THE DETERMINATION OF BANK INTEREST RATES

Theoretical setting

The estimation of equations that determine bank interest rates is based on the first-order conditions of a Klein-Monti type model, in which intermediaries maximise profits in the current period and have the capacity to set the price in both the credit and the deposit markets. There is a third, competitive market in which they are not able to influence the price (the interbank or government debt market) and to which they resort to seek a return on surplus liquidity or borrow funds. Consequently the latter market is one of adjustment between the market for credit and that for deposits. Under these assumptions, the interest rates on credit and on deposits are determined separately and independently. If, in addition, it is assumed that there is product differentiation and strategic interaction between bank intermediaries, banks' decisions on prices will depend on the actions of rivals or competitors, so that the elasticity perceived by each bank will be the outcome of: the price elasticity of the consumers whose demand it satisfies and the degree of rivalry among market participants.

One of the features inherent to the credit market is the risk arising from the uncertainty about collecting loan principal and interest. So as to take this aspect into account, the probability of incurring past-due loans which, along with interest rates, determines the expected return on the loan portfolio, has been introduced into the above-mentioned model.

The overall consideration of all these aspects in a current profit maximisation model gives rise to two first-order conditions[3]:

$$r_L^i = \left[p^i + \frac{p^i}{h_L^i + h_L^M} \right]^{-1} \left(r + c_L^i \right) \tag{1}$$

$$r_D^i = \left[1 + \frac{p^i}{h_D^i + h_D^M} \right]^{-1} \left[r - c_D^i \right] \tag{2}$$

where:

r_L^i: lending interest rate extended by bank i.

r_D^i: deposit interest rate offered by i.

3 See Appendix 1 for a more detailed presentation of the model.

r: marginal financial cost - usually some type of representative market rate.

c_L^i: marginal operational cost of credit extended by i.

c_D^i: marginal operational cost of deposits raised by i.

p^i: probability of the typical client of bank i paying for the credit in due time = 1 - average probability of recording past-due loans.

h_L^i: elasticity of the demand for credit received by i if competitors do not react (related to consumer characteristics).

h_D^i: elasticity of the supply of deposits raised by i if competitors do no react

h_L^M: degree of rivalry of firms in the credit market:

h_D^M: degree of rivalry of firms in the deposit market.

One of the features of this model is that the credit market and the deposit market are independent, that is, loan rates and deposit rates are determined separately. However, this is a fairly controversial hypothesis in banking behaviour models.

In Spain's case, the empirical evidence available offers various results. The papers by Hernández (1994), Sáez (1996a) and Sáez (1996b) confirm the existence of separability, while Sastre (1991) and Camarero et al. (1995) reject this hypothesis. Nonetheless, the difference in results here could stem from the different sample periods analysed. These range from the eighties -Sastre (1991) and Camarero et al. (1995)- to the nineties -Sáez (1996a) and Sáez (1996b)-. Throughout this period the role played by the interbank market in bank intermediaries' decisions might have been progressively modified.

In the first half of the eighties, the notable volatility of interest rates on this market might have entailed an additional marginal cost of interbank *financing* to that arising from maintaining *credit* positions in the market. Thus, banks might have encountered certain liquidity constraints, depending on whether the gap between credit and deposits was positive or negative. Against this background, the marginal cost of obtaining new credit was not independent of the volume of credit and deposits but related to the magnitude of the gap between them since this determined the likelihood of having to resort to obtaining interbank

financing. Therefore, the rule for determining the lending interest rate was not independent of the entity's volume of deposits[4].

Bearing in mind these considerations and that the period analysed in this paper relates to a situation of scant interbank market interest rate volatility, it has been opted to accept that the marginal cost of interbank financing does not depend on the stock of loans and deposits. Thus separability between the credit and deposit markets is assumed and type-(1) and (2) interest rate equations are estimated[5]. By making appropriate assumptions, these can be embedded in the following empirical equations[6]:

$$r_L^i = b_o + b_1 r + b_2 c_L^i + b_3 p^i + b_4 h_L^i + b_5 h_L^M + e_L^i \quad (3)$$

$$r_D^i = g_0 + g_1 r + g_2 c_D^i + g_3 h_D^i + g_4 h_D^M + e_D^i \quad (4)$$

The estimation of these equations has been made with a panel of Spanish banking institutions -banks and savings banks-. This allows to control for a series of characteristics proper to each bank which give rise to non-observable heterogeneity and which are included in the individual effects of both equations (e_L^i, e_D^i). Thus, included in these effects there would be a series of aspects which define the management and organisational framework proper to each intermediary and which, basically, determine the degree of X-inefficiencies. A decrease in the magnitude of these X-inefficiencies in a bank would clearly reduce its marginal cost, even though it were not necessarily reflected in its accounting costs. As long as marginal cost is affected, the model predicts an impact on bank lending and deposit rates. However, this channel is not accounted for by any of the variables included in equations (3) and (4), except for the individual effects e_L^i and e_D^i

In this study, it is assumed that the level of these inefficiencies holds stable over time for each bank. This is a fairly common assumption in models used to estimate X-inefficiencies based on frontier functions with panel data. However, some researchers have focused on relaxing this assumption at the cost of imposing some structure on the models (i.e. some of them assume that efficiency change is the same for all firms). In the current study the assumption of firm-specific and time-invariant technical efficiency is preferred since the empirical evidence available for the Spanish banking intermediaries

4 This interpretation of the empirical evidence in Spain's case is based on the model by Tobin (1982) and the comments thereon by King (1986).

5 A theoretical setup very similar to ours is Jaumandreu and Lorences (1999).

6 See Appendix 1.

shows that changes over time are either scarcely significant[7] or non-significant, on average[8].

To obtain empirical equations that may be estimated with the information available, some additional assumptions have been made.

First, the price elasticity of loan demand and of deposit supply corresponding to each intermediary (h_L^i, h_D^i) depends on the consumer characteristics of each intermediary market segment and on cyclical macroeconomic factors. Consumer characteristics in these market segments are assumed to hold stable over time, so being captured by individual effects. On the other hand, the potential impact on price-elasticity of the economic cycle is captured by including the GDP growth rate as an additional explanatory variable in interest rate equations (3) and (4). This decision merits some further comments.

If constant price-elasticity functions are assumed away for loan demand and deposit supply, then elasticity generally depends on the same variables as the original functions (i.e. if the supply of deposits raised by a bank is assumed to depend on its customers' income, it is expected that the first derivative will also depend on it). Therefore, one important factor determining the time-varying average pattern of price-elasticity might be macroeconomic growth.

The relationship between price-elasticity and the economic cycle has been scarcely analysed in the literature, although some insights can be gained from the more widely analysed issue of price mark-ups being procyclical or countercyclical. Empirical evidence can be found which favours both alternatives and several explanations have been provided for both results. Among them, that given by Bils (1989) is closely related to this paper's assumption of a cyclical pattern in price-elasticity. This author builds up a theoretical model which hinges on the result that higher-wealth consumers have less price elastic demands. The reason for it is that consumers with more resources will place a lower shadow utility value on income. As a consequence, firms set higher price mark-ups on marginal costs in those markets. This cross-sectional explanation can be translated into a similar time-varying one in the following way. In boom periods, when higher average income is expected, average elasticity of consumer demand will tend to be lower and price mark-ups higher, showing a procyclical pattern.

Secondly, it is assumed that the most relevant aspects of the multiplicity of interactions between the banks participating in the market for credit and deposits (which are included in the terms h_L^M and h_D^M) may be captured via an indicator approximating to the

7 See Alvarez y Orea (1998).

8 See Maudos (1996) and Rios (1997).

changes over time in the degree of competition in the market for credit and in that for deposits.

Nonetheless, it is difficult to define adequate variables to capture changes in market competitive pressure. Most studies use concentration as a proxy of the degree of competition. However there are at least three reasons why this is not a good choice in this study.

First, according to contestable market theory, concentration is not a good indicator of market competition. It is possible to observe highly concentrated markets where competition is also very intense because barriers to entry are not substantial and the potential competition from new entrants deters non-competitive behaviour by incumbent firms.

Second, concentration measures would only make sense in a well-defined market. Many features of banking activity suggest thet the relevant markets for deposits and loans are mainly local. Therefore, the geographic areas for relevant bank markets should first be defined in Spain, calculating thereafter concentration measures on those markets so defined. However, these measures could not be related to interest rates since information on interest rates by geographic area is not available.

Third, Spanish retail bank markets might be considered contestable to a certain extent, given that there is a threat of new entrants although the cost of entry and exit can be considerable. In these circumstances, the increase in market concentration, which has been observed as a consequence of mergers, could be hardly identified as a sign of weaker competition.

Taking into account all these considerations, a different indicator of price competition has been used in this study: the cross-section dispersion of loan and deposit interest rates.

The idea underlying the use of dispersion in interest rates as an indicator of changes in the degree of competition among bank intermediaries is as follows: as the competitive pressure in a market with a certain degree of product differentiation heightens, the companies participating in said market will have less ability to set prices differentiated from those set by the rest of the competitors, whereby price set by each company will tend to converge. Nonetheless, this reduction in dispersion could likewise be the outcome of a wide range of circumstances. Hence, this variable cannot be univocally interpreted as a competition indicator. However, if the non-sample information relative to events in the Spanish banking sector is taken into account, the declining tendency of dispersion (see Chart 2), should be interpreted as evidence of greater competitive pressure[9].

[9] An example of a similar framework used to analyze price dispersion can be found in Abbott (1994).

A third assumption made in this study is that average costs are a good approximation to marginal costs, i.e. most intermediaries operate with constant returns to scale[10].

Lastly, it is assumed that banks do not have sufficient information to distinguish between the operating costs arising from their respective activities in the credit and deposit markets, and consequently tend to charge the aggregate of both, c^i.

Data used

The variables in equations (3) and (4) have been approximated via the following information:

r_L^i :interest rate on mortgage loans;

r_D^i: interest rate on time deposits with a maturity equal to or more than one year and less than two years;

r :internal rate of return on government bonds with a maturity equal to or more than two years or, alternatively, the three-month interbank interest rate along with the differential between both interest rates;

c^i :operating expenses per asset unit;

$(1-p^i)$: ratio of non-performing loans to total credit extended;

h_L^M, h_D^M :cross-section dispersion of bank interest rates.

In the estimations, interest rates on specific bank operations have been used rather than synthetic interest rates including those on the various credit and deposit-raising operations, so as to avoid potential effects induced on average rates by changes in the composition of banking activity.

When considering the market rate to be used as representative of the marginal financial cost faced by banks, two requirements should be verified: a) it should be the price of operations negotiated in markets where banks behave as price-takers and to which they can resort in case they need funds or when they have surplus liquidity; b) the average term of operations to which this price is referred should be similar to that of deposits or loans for

10 This assumption does not run counter to empirical evidence from the Spanish banking system, given that economies of scale have not been observed at firm level (see footnote 1).

which they might substitute. In the Spanish financial system this role has been played both by the interbank and government debt markets. Therefore, both interest rates have been tried as indicators of the marginal financial cost faced by banks. However, care has been taken to introduce the interbank interest rate together with an indicator of interest rate expectations over a longer term -i.e. the differential between the internal rate of return on government bonds and the three-month interbank rate- to take into account that the average term of bank lending is longer than that of operations in the interbank market. Alternatively, the government debt rate has also been used as a market rate representative of banks' marginal financial cost[11.]

In principle, all the variables are considered to be exogenous except for the ratio of non-performing loans to total credit which is treated as an endogenous variable since it depends on past values of loan interest rates. Therefore, the mortgage loan rate equation is estimated by using an instrumental variable method. In particular the generalised method of moments technique developed in Arellano and Bond (1988) is used to obtain valid instruments.

A dummy variable (FUS) has been added to capture the possible differential effect of merger processes on the interest rates of the entities resulting from such processes. This dummy takes a value equal to one in these entities during the three years following the merger or takeover date[12,] and a value equal to zero in the remaining observations. This dummy has been introduced into the equations in two different ways: either directly, so that it affects the individual effects, or interacting it with the indicator of market competition. In the first case it would reflect the impact on interest rates of organisational changes that could have a bearing on the level of X-inefficiencies, while in the second instance it would reflect an effect of consolidation processes on the competitive response of intermediaries.

The analysis has not included all the mergers that have taken place in the period under consideration, since a series of prior conditions was established which had to be met by the merger for its inclusion in the analysis.

Firstly, only mergers between deposit money institutions have been taken into account, with all mergers between specialised financial credit establishments or between the latter and deposit money institutions being excluded from the analysis. The reason for their exclusion is that the motivation for this type of merger was the reorganisation of financial groups further to legislative changes and, therefore, they do not fit into the habitual

11 The empirical evidence in Sastre (1998) shows that both alternatives are fairly equivalent for longer-term loans, this not being the case for short-term and variable rate lending.

12 There are grounds for believing that some of the possible effects of a merger on interest rates may be of a more permanent nature. However, merger effects would be hardly disentagled from those caused by other factors in the simple framework considered in this paper. Furthermore, a majority of studies consider that most of the effects brought about by mergers cease to be felt after three or four years. See, for instance, Peristiani (1996) and Vander Vennet (1996).

pattern of mergers between independent entities. For the same reason, other mergers between deposit money institutions when this was a consequence of internal group reorganisation have also been excluded, as have mergers of foreign banks' branches when this was a consequence of mergers between their parent banks.

A size criterion has also been established so as to consider a merger operation, excluding from the analysis all those mergers where the entity merged or taken over does not exceed 15% of the total assets of the larger-sized entity. This is to avoid the inclusion of operations in which it is highly likely that major changes will not be detected in view of the small size of one entity in relation to the other.

Also excluded are those mergers in which the resulting new entity lasted for less than one complete financial year, since this makes the type of analysis conducted in this study impossible owing to the lack of data. If the disappearance of the new entity was as a result of a new merger, only the latter operation will be considered.

Lastly, it has also been decided to exclude one particular operation since, although it met the established requirements, it showed anomalous values for the ratios considered (such as negative net income) and excessive volatility in the ratios relating to balance-sheet structure; accordingly, its inclusion in the sample might have distorted the data.

Applying these criteria, 18 merger operations have been included in the analysis. Of these, two involve large private banks, two medium-sized subsidiaries and the remaining 14 various savings banks. Three of the mergers are between more than two entities, the rest being between two institutions.

All the data are annual average values obtained from the information on interest rates provided monthly to the Banco de España by banks and savings banks and from the accounting information included in confidential statements. The sample of intermediaries included in the panel data corresponds to those which have reported interest rates on an ongoing basis. The information covers the period from 1988 to 1997.

Results of the estimations

Tables 2 and 3 offer the results of the estimations. These should be interpreted with some caution in view of the scant number of mergers and takeovers in the sample. The key aspects of these results are as follows:

a) In general, the competitive response of Spanish intermediaries resulting from consolidation processes is not lower, on average, than that shown by other entities. There are even signs that this response may have intensified in the mortgage market if regard is

paid to the sign and the t-ratio value of the coefficient of the variable resulting from interacting the competition indicator with the merger dummy variable.

b) The potential organisational changes related to X-inefficiencies –and not reflected in accounting costs-, following consolidation processes do not appear to have affected the level of either mortgage loan interest rates or deposit interest rates.

c) The variable used to approximate to the changes in the degree of average competition in bank markets has a high explanatory power in the two interest rate equations, indicating the relevance this factor has had in determining Spanish bank rates in the nineties.

The results obtained appear to confirm those from other, more qualitative studies in which significant differences are scarcely detected in the firms resulting from mergers compared with certain control groups or with the remaining market participants. This may be interpreted in the sense that mergers and takeovers per se do not give rise to generally differentiated forms of behaviour, and that are other types of factors which determine whether potential effects of a merger arise or not. Consequently, it is appropriate to supplement these results based in the use of statistical inference with a more detailed analysis of the effects of mergers on profitability and efficiency. The following section undertakes this task, looking into the effects of each merger observed in the sample on the balance sheet of the entities concerned.

III.- CASE BY CASE ANALYSIS OF BANK MERGERS IN SPAIN IN THE PERIOD 1988-1997

The case-by-case analysis of mergers is made by comparing changes in the values of certain financial ratios of the institution resulting from the merger process with the same ratios calculated for a comparable group the selection of which will depend, in each case, on the characteristics of the entities that have merged.

Methodology and ratios used in the analysis

To analyse the impact of mergers on banks, several indicators have been selected which seek to measure the effects of the merger on various aspects of bank activity. Five groups of indicators are specified. First are those which attempt to measure profit-generating capacity; second, indicators of the level of efficiency and productivity; third, indicators of changes in market share; fourth, indicators of business structure; and lastly, indicators of capital adequacy.

The basic indicators used are as follows:

Group 1: Profit-generating capacity

* Total income: interest income + commissions + result on financial operations

* Interest expenses

* Gross income: total income - interest expenses

* Operating expenses

* Net income: total income - interest expenses - operating expenses

All of these indicators are expressed as a percentage of average total assets

Although ROE is widely used as a profit-generating capacity ratio, it has not been used in this analysis because of the erratic behaviour of some items -mainly net provisions and profit and losses from securities and real estate sales- that are included in the calculation of final profit.

Group 2: Efficiency and productivity

* Operating expenses / average total assets

* Operating expenses / total income

* Operating expenses / gross income

* Productivity per employee: average total assets / number of employees

* Productivity per office: average total assets / number of offices

* Number of employees and offices following merger

In turn, to obtain supplementary information, three additional types of indicators are used, namely:

Group 3: Indicators of market share and total assets growth

* Growth rate of total assets

* Market share (in terms of total assets).

Group 4: Indicators of business structure

* Lending-deposit activity in pesetas, as a percentage of total assets

Group 5: Indicators of capital adequacy

* Capital / total assets

In each merger these indicators have been calculated annually for the four years prior to the operation and the four years after, or for those years for which data were available if the subsequent period ran past 1997.

The indicators have been obtained from the information in the financial statements of the merged institution during the period subsequent to the merger and by aggregating the corresponding items in the financial statements of the institutions intervening in the merger process for the previous period. The values of these indicators are compared in each case, with those that would be obtained from a specific control group for each type of entity [13].

The control groups considered in this study are the following ones: the group of four major banks, in the case of mergers between large banks, the group of subsidiary banks of domestic banks for mergers of this type, and the total sum of savings banks for mergers between these institutions.

The comparison is established between the average of the four years prior to the merger with the average of the four years after. The values obtained for each year, are also analysed. The analysis attempts to locate potential improvements in the values of these indicators for each entity vis-à-vis the values of the control group. The results are presented as the change observed in the difference between the average values of the entity analysed and the control group before and after the merger. A significant improvement in the compared values of a high number of indicators in a specific section would be indicative of the fact that the merger has proven positive for the entity in that area of activity. A "significant improvement" in an indicator is taken to be a positive change in its average value higher than one standard deviation of the difference vis-à-vis the control group[14]. A "significant worsening" would be a negative change higher than one standard deviation, while relatively insignificant changes would be those in the range of $\pm$1 standard deviation.

Tables A.1 to A.3 included in appendix 2 draw together the results of the analysis conducted, reflecting the changes that have come about in relation to the control group in the indicators considered. Also, in charts 3 to 8 the main results are summarised. Generally,

13 The control groups considered also include the merged institutions.

14 Standard deviations have been calculated from the differences over the eight-year period analysed.

these changes are expressed in basis points, except in the case of market indicators (where a distinction is made only between a positive and a negative change) and in the case of the number of employees and offices (where only an increase or a decrease in this number is indicated). Moreover, information is given on the initial situation of the entities taking part in the merger, showing whether these had higher or lower efficiency ratios than the control group considered.

Summary of results [15]

The results of the analysis carried out do not differ too much from those of other studies carried out on the effects of mergers in the Spanish banking system. As an examination of graphs 3 to 8 shows, the effects of the mergers analysed on the profit-generating capacity and the level of efficiency of the institutions are not very clear. In some cases signs of improvement are detected in comparison with the control group, while in other mergers these effects are not so clear and deteriorations are even observed after the merger.

However it may be cautiously ventured that the mergers analysed had a certain favourable effect on financial expenses (see table A.1 in appendix 2). This might be related to the increase in market power of some of the analysed institutions following the merger, owing to their market share having risen in their regional area of operation, but to confirm this supposition, it would be necessary more in-depth analysis. This effect is counteracted by the negative evolution observed in total revenues, due to the change observed in the balance sheet structure with a higher proportion of operations with narrower margins (see Table A.3), so that the final effect on gross income and net income is uncertain -see graph 3 and 4.-

In most of the cases analysed there does seem to be a slight improvement in the ratio of operating costs to average total assets -see graph 5-. However, the changes seen are, in many cases, barely significant and if the analysis is limited to those mergers in which significant changes are observed, the results are much more ambiguous.

Significant increases in productivity per office and productivity per employee have been detected in most of the cases analysed -see graphs 6 and 7-, due to the combined effect of balance-sheet growth and the reduction in the number of offices.

Nonetheless, these increases in productivity have not been clearly reflected in the efficiency ratio (operating costs/average balance sheet) due to the downward rigidity of staff costs and, to a lesser extent, of overheads. In the case of staff costs this rigidity is explained by the costs associated with making staff cutbacks, since the compensation paid or the

15 A more detailed explanation of the main findings of the ratio analysis can be found in appendix 2.

costs arising from early-retirement plans curb the reduction in staff costs. In the case of overheads the reason could have been an increase in some costs associated with the process of internal reorganisation. When analysing the other efficiency ratios used, which relate operating costs to gross and total income, the results are less clear because, in certain cases, productivity gains have had a negative impact on the level of income generation if they occurred as a consequence of a growth in business areas with lower margins.

When comparing the changes in the number of employees and offices with the growth of total assets after the merger (see Tables A.2 and A.3), it is clear that in most cases in which after the merger there is an increase in market share, neither the number of employees nor the number of offices decreases. Conversely, in all those cases in which there is a reduction in the number of employees and offices, except in one in which the result is uncertain, there is also a slowdown in the growth of total assets and losses of market share. This suggests the existence of two types of mergers, those in which business expansion criteria predominate and others in which criteria of cost cutting and productivity increases predominate. However, the differences between these two groups are not clear, since as commented above, the reductions in staff and offices are not always reflected in changes in operating costs, so that the differences between the two groups are not very evident when comparing their efficiency ratios.

The clearest effect in the mergers analysed, as can be seen in graph 8, is the increase in the capital-adequacy ratio of the merged institutions, due largely to the disclosure in books of reserves upon the revaluation of assets recorded at cost price during merger processes. Although this effect is a purely accounting phenomenon, it is of economic relevance for some institutions, particularly savings banks, since it allows them to increase their available capital[16] and thereby have a larger margin for making new investments. It also contributes to improving their financial ratios, which could be reflected in a smaller risk premium, reducing their financing costs, and thus improving their profit generating capacity.

IV.- CONCLUSIONS

In this study a short to medium term perspective has been adopted as a three or four year horizon has been chosen to be analyzed after each merger. Although most studies tend to focus on this period, the impact of merger operations on long run bank proflitability may take more time to develop. Therefore it should be borne in mind that the

16 The application of accountancy methods based on the principle of historic cost are the origin of these hidden reserves which appear when the asset is valued at current prices.

results of the study do not rule out this potential long run effects, which have not been analyzed here.

An overall evaluation of the results of the various sections of this paper leads to two types of conclusion.

First, the consolidation of the banking industry does not appear to have lessened the growing degree of competition which has been seen in the sector in recent years. A bigger size offers, in principle, greater capacity to set prices out of line with the market, but in an environment characterised by a fierce competition, it is probably very costly -in terms of market share- to take advantage of this fact. In principle, it could be argued that this capacity is the main reason for the significant reduction in interest expenses which has been observed in some takeovers. However, it is not clear if this should be interpreted either as the result of an increase in market power or as an strategic decision taken by most banking institutions which have ruled out competing strongly in the deposit market and have shifted a good deal of competitive pressure to the mutual fund market. Within a process marked by the general shift of savings from bank deposits to mutual funds, this decision seems to be a sensible way to redistribute competitive pressure among different markets while minimising its negative impact on profitability.

The basic effect of any merger or takeover is to widen the range of strategic alternatives available to a bank, by enabling it to attain a size which, in the absence of this process, it could probably not have achieved and by requiring a reassessment of existing organisational arrangements. It seems that in the case of mergers and takeovers in Spain one can speak of two types: those which have sought to expand business and those which have opted for increases in productivity and improvements in the level of efficiency. The ambiguity of the results obtained in terms of profitability per unit of assets would suggest that it is practically impossible to achieve both things at the same time; i.e. the growth in the gross income of certain merged institutions as a result of a strategy of business expansion is usually accompanied by an increase in operating costs which tend to compensate the higher income. On the other hand, those institutions which opt for a significant reorganisation, with elimination of duplications in their office networks, seem to suffer a loss of income-generating capacity, so that the productivity and efficiency gains are not transformed into improvements in profitability, at least within a four-year period.

In short, it may be said, in general, that although the mergers analysed in this study give no clear results as regards improvements in the profit-generating capacity or efficiency levels of the merged institutions, from the viewpoint of the banking sector they can be mostly considered satisfactory, since they have been an instrument for achieving some positive objectives: a) certain reductions in costs, although these have been small; b) implementation of rationalisation plans which, although they have not been immediately

reflected in banks' profit and loss account due to the difficulties and high costs of staff cutbacks in Spain, have certainly served to improve the competitiveness of some institutions; and c) improvements in capital-adequacy ratios, which have helped to facilitate investment growth. These effects observed in the mergers analysed, have most likely helped put the merged institutions in a better position to confront the growing competition in the financial sector, specially in those cases where merged institutions were of a relatively small size and competitors in the same regional market.

APPENDIX 1

The group of models that seem most satisfactory for analysing bank interest rate determination are those that consider banks as firms operating in imperfectly competitive markets. Within this group, the "Klein-Monti model" is relatively standard in studies of the setting of interest rates by banks, being frequently used as a reference paradigm to introduce elements of greater complexity[17].

The Klein-Monti model assumes the existence of two markets -loans and deposits- in which the banks have access to differentiated segments -their customers. In this way they are able to maintain a certain amount of market power in those market segments. There is a third market in which the banks operate as price-takers. In most models this is usually a public or private securities market; however, in the version presented in this paper, banks obtain finance or invest funds on the interbank market at an interest rate controlled indirectly by the Bank of Spain.

According to this version, the balance-sheet constraint of a bank is given by:

$$qD + L = FI + D$$

where:

q: reserve ratio

D: deposits

L: loans

FI: interbank financing

Each bank maximizes current profits given by:

$$p = r_R q \cdot D + r_L L - rFI - r_D - C$$

where:

r_R : rate of return of reserves

r_L : interest rate on loans

17 See Klein (1971) and Monti (1973).

r_D : deposit interest rate

r : interbank market rate

C : operating costs, which is a separable function of the volume of loans and deposits, C = C (L,D).

In this model the decision variables for each intermediary are the interest rate on loans and on deposits, r_L and r_D. Once the values of these interest rates are set, credit demand determines the amount of credit and deposit supply determines the volume of deposit. This in turn requires the maintenance of a volume of bank reserves which, in conjunction with the volume of credit granted, gives the size of the balance sheet. In these circumstances, it is precisely interbank borrowing which adjusts the funds raised on the deposit market to the investment requirements on the lending side.

The decision-making rules that determine the interest rate for loans and deposits are given by the following first-order conditions:

$$r_L^i = \left(1 + \frac{1}{h_L^i}\right)^{-1} \left(r + c_L^i\right) \qquad \text{(A.1)}$$

$$r_D^i = \left(1 + \frac{1}{h_D^i}\right)^{-1} \left(r - c_D^i\right) \qquad \text{(A.2)}$$

where the i superscript has been added in order to shift away from the representative agent framework and explicitly introduce the differentiated product nature of banking markets. In addition, the variables relating to the reserve requirement ratio, which would influence the deposit interest rate, have been omitted. The reasons for this omission are the small magnitude of the changes in this ratio in the sample period used in the estimations of this paper and the fact that it was not significant in earlier periods of time[18], when these changes were larger. The meaning of the symbols is as follows:

h_L^i, h_D^i :elasticities of credit demand and deposit supply, respectively, for each intermediary i;

c_L^i, c_D^i :marginal operating costs of loans and deposits.

18 See Sastre (1991).

According to equation (A.1), the banking firm i sets the lending rate r_L^i in such a way as to make the marginal income and marginal cost of loans equal. The marginal cost is a function of the opportunity cost as reflected by a market rate, such as the interbank rate, and the increase in operating costs derived from raising the volume of loans instead of borrowing on the interbank market. Similarly, equation (A.2) indicates that a banking intermediary i establishes the interest rate on deposits r_D^i in such a way that there is no difference between raising additional funds in the interbank market or in the deposits market. In the latter case, the marginal cost is the sum of two components: the increase in costs due to the fact that the supply of deposits is not perfectly elastic and the increase in operating expenses produced by increasing the level of deposits.

With both loans and deposits, the response of interest rates to variations in the marginal -financial and operating- cost is a function of the price elasticity for each of those markets, which, in principle, may vary at any point on the credit demand and deposit supply curves.

The Klein-Monti model assumes that banking intermediaries have market power in both the lending and deposit markets, but it does not envisage the possibility of a strategic interaction between them. Thus, market structure is not fully reflected in this model. To incorporate the possibility that an institution's decisions on prices and volumes depend on actions undertaken by competitors, plus the existence of product differentiation (derived in the case of banking from the fact that the market each entity serves differs from others), two further variables are added to the model:

e_L^{ij}, e_D^{ij}: substitution elasticities between products of intermediaries i and j in loan and deposit markets;

e_L^{ij}, e_D^{ij} :changes in the prices of competitor j when i decides to change its prices. In other words, conjectural variations between (i,j) in loan and deposit markets.

In an imperfect competition model with product differentiation in the loan and deposit markets, the factors conditioning the interest rates fixed by banking intermediaries are the following:

$$r_L^i = \left[1 + \frac{1}{h_L^i + \sum_{j \neq i} e_L^{ij} e_L^{ij}}\right]^{-1} \left(r + c_L^i\right) \qquad \text{(A.3)}$$

$$r_D^i = \left[1 + \frac{1}{h_D^i + \sum_{j \neq 1} e_D^{ij} e_D^{ij}}\right]^{-1} \left(r - c_D^i\right) \qquad \text{(A.4)}$$

These equations indicate that the sensitivity of bank interest rates no longer depends solely on the price elasticity of each banking institution's own market as in (A.1) and (A.2) but also on the type of strategic interaction among participants in the same market and the degree to which their products -or different client segments-can be substituted for one another.

Nevertheless, this framework is still insufficient to explain how banks behave, because it fails to take into account the risk inherent in granting a loan because of uncertainty as to whether the interest will be paid and the principal repaid[19]. If this is borne in mind, equation (A.3) allows us to calculate the expected return on the loan portfolio R_L^i:

$$R_L^i = g\left[\underline{r_L^i},\ p^i(\cdot)\right]$$

where:

$\underline{r_L^i}$: interest rate vector of (k×1) dimension established by the i-th bank for k types of credit in its market;

$p^i(\cdot)$: average non-performing loan probability function of bank i, which depends, in turn, on the interest rate on loans $\left(r_L^i(k)\right)$ for the class k customer and on the overall state of the economy (y)

Under the assumption that the risk groups into which the customers of a bank can be classified may be represented in the form of an average prototype customer with a binomial probability function that corresponds to the event: payment/non-payment of the loan in due time, the expression (A.3) may be rewritten as:

19 The findings of Slovin and Sushka (1984) indicate that the most appropriate theoretical framework for presenting empirical evidence on banking firms' performance should combine portfolio theory and price-setting in an imperfect competition market.

$$r_L^i = \left[p^i + \frac{p^i}{h_L^i + h_L^M} \right]^{-1} \left(r + c_L^i \right) =$$

$$= \left[p^i \left(1 + \frac{1}{e_L^i} \right) \right]^{-1} \left(r + c_L^i \right) = m_L^i(\cdot)\left(r + c_L^i \right) \qquad \text{(A.5)}$$

where:

p^i: probability of the client of bank i paying for the credit in due time = 1 - average probability of recording past-due loans.

e_L^i: elasticity perceived by bank i in the credit market.

h_L^i : elasticity of the demand for credit received by i if competitors do not react (related to consumer characteristics)

h_L^M: degree of rivalry of firms in the credit market given by:

$$h_L^M = \sum_{j \neq i} e_L^{ij} \, e_L^{ij}$$

The expression (A.4) can also be rewritten in a similar way:

$$r_D^i = \left[1 + \frac{1}{h_D^i + h_D^M} \right]^{-1} \left(r - c_D^i \right) = \left[1 + \frac{1}{e_D^i} \right]^{-1} \left(r - c_D^i \right) = m_D^i(\cdot)\left(r - c_D^i \right) \qquad \text{(A.6)}$$

where:

h_D^M: degree of rivalry among firms in the deposit market, given by:

$$h_D^M = \sum_{j \neq i} e_D^{ij} e_D^{ij}$$

According to these last equations, banks fix lending and deposit rates in terms of: the marginal -financial and operating- cost, the price-elasticity of demand, the type of strategic interaction among the institutions operating in the loan and deposits market, the

degree of substitution with competing products or markets, and, lastly, the probability distribution of overdue loans.

On the basis of a first-order approximation to functions $m_L^i(\cdot)$ and $m_D^i(\cdot)$ -which assumes that the interaction terms (cross derivatives) and the second derivatives of each variable may be omitted (only if h^i, e^{ij}, e^{ij} *and* p^i are not interrelated)- two linear functions could be specified: one for r_L^i and another one for r_D^i, in terms of r, c_L^i, c_D^i, and of the various variables on which the functions $m_L^i(\cdot)$ and $m_D^i(\cdot)$ depend $(h^i, h_L^M h_D^i, h_D^M$ *and* $p^i)$. The empirical formulation of these functions would correspond to the equations (3) and (4) of the main text:

$$r_L^i = b_o + b_1 r + b_2 c_L^i + b_3 p^i + b_4 h_L^i + b_5 h_L^M + e_L^i \qquad \text{(A.7)}$$

$$r_D^i = g_0 + g_1 r + g_2 c_D^i + g_3 h_D^i + g_4 h_D^M + e_D^i \qquad \text{(A.8)}$$

APPENDIX 2

This section contains the main findings of the case-by-case analysis which are summarised in Tables A.1 to A.3. Comments are organised in three parts, each analysing a specific area of the entities' activity.

Profit-generating capacity

The results for the first group of indicators, which attempt to measure entities' profit-generating capacity, are summarised in Table A.1. As can be seen, the results of the analysis are rather unclear, although there is generally a larger number of cases in which there is a worsening of profit-generating capacity, whatever the indicator used to measure it.

The analysis of the data excluding the cases in which changes are no significant reveals some details of interest.

First, it is seen that the effects of the mergers analysed appear to have different effects on the course of financial charges and of total income, with a higher number of negative changes in the latter case, while positive changes predominate in financial charges. The improvement in financial expenses may be related to the increase in market power of the entities analysed following the merger, owing to their market share having risen in their regional area of operation[20]. On the other hand, negative effects on total income might be related to a shift in the balance sheet structure after the merger towards operations with lower margins such as the activity in foreign exchange markets or money and securities market which substitute the traditional lending/deposit activity (see Table A.3). More in-depth analyses would, however, be needed to confirm these hypotheses.

Second, if we analyse gross income margin, the final conclusions are less clear because the trend in total income offsets the improvement recorded in financial expenses. Thus, out of the 9 cases where there were significant changes in gross income, 4 were positive and 5 were negative. When analysing net income the results are similar: out of 10 cases where significant changes were observed, 5 were positive and 5 negative.

Generally, the results are worse in mergers between banks than among savings banks, since in 3 cases there was a significant worsening in profit-generating capacity measured in terms of net income and, in one case, a non-significant worsening. In the group of savings banks, out of a total of 14 cases there was a significant improvement in profit-generating capacity in 5 cases, no substantial positive changes in 4 cases, no substantial negatives changes in 3 cases and only a significant worsening of the post-

20 Many of the mergers analysed are between savings banks, whereby their reference market would be the regional market rather than the national market, where their share would be much smaller.

merger situation in 2. The worse behaviour of banks was in some respect the result of a bigger switch in activity towards operations with narrower spreads. As can be seen in table A.3, in all the mergers between banks there are significant reductions in the ratio of peseta lending and deposits to total assets, which is the business area with the highest spreads. The changes in business structure in savings banks were less evident and, although there was some switching in activity towards business areas other than traditional ones, the influence of these changes on profit-generating capacity is less clear owing to the scant significance of these shifts[21].

Efficiency and productivity

Table A.2 illustrates the results obtained with the second group of indicators, which attempt to measure changes in efficiency. As can be seen, the results of the analysis in this case are somewhat more positive, since in most of the cases analysed there were improvements in productivity per employee, productivity per office, and, to a lesser extent, in the ratio of operating costs to average total assets. The effects of mergers are less clear in the case of the other two ratios considered, as a consequence of the greater variability observed in the profit-generating capacity of institutions which have been through a merger.

Nonetheless, a more detailed analysis shows that, although mergers had a positive effect on the ratio of operating costs to average total assets, in many of the cases (9 cases) the changes are barely significant. If we only considered those operations in which the effects of the merger are significant, the results are much more ambiguous (see table A.2). In the case of productivity per employee and productivity per office the situation is more positive as the number of significant improvements is bigger than the number of worsening cases in both ratios (see table A.2). Furthermore, there appears to be a relationship between productivity per employee and per office and the ratio of operating costs to average total assets. Of the nine cases in which there is an increase in both productivity ratios, in eight there is also an improvement in the latter ratio, while in the four cases in which there is a fall in productivity levels, in three of them there is a deterioration in this ratio.

When analysing the other efficiency ratios, it is found that changes in gross income were generally larger than changes in operating costs, thereby the efficiency ratio (operating costs/gross income) is more influenced by the changes in the former variable. There is therefore an overlap between those institutions showing improvements in the generation of profits and those showing improvements in this efficiency ratio (see Tables A.1 and A.2).

21 The average reduction in the ratio of lending+deposits in pesetas to total assets is 773 basis points for mergers between banks and 125 basis points for savings banks.

The changes in the ratio which relate the level of operating costs to the level of total income indicate that, in certain cases, productivity gains may have a negative impact on the level of income generation if they are the consequence of growth in business areas with lower margins.

This hypothesis is partly confirmed by the relationship which seems to exist between changes in the ratio of peseta loans and deposits to total assets and the growth of total assets after the merger, since, in general, mergers in which there is a larger fall in the above-mentioned ratio are those which show the greatest growth in total assets. This is because, in general, intermediation activities in the foreign-exchange, money and securities markets are operations involving larger amounts of funds than the traditional lending/deposit ones and they therefore facilitate growth in total assets, albeit with lower operating margins. It seems that, as a result of this, those institutions which had achieved higher rates of growth in their total assets -as a consequence of a shift of activity towards these areas of business- also showed a reduction in their operating costs in relation to total assets, although the ratios of their operating costs to income did not necessarily fall, since their total income might be affected by the change in the structure of business.

There does not seem to be any clear relationship between a better performance of the ratio of operating costs to average total assets and the reduction in the numbers of employees and offices[22]. This happens because in many cases in which the merger involves a reduction in staff, the gains arising from such action are practically cancelled out by the increase in the costs per employee as a consequence of the impact of severance payments or because the reduction in staff is achieved through early retirement which does not reduce staff costs. A similar situation occurs, although to a lesser extent, in those cases in which there is a reduction in the number of offices, since overheads per office tend to increase more than the sector average, reducing the impact of the saving on operating expenses. This effect could be associated with a transitory increase in overheads due to the process of internal reorganisation of the merged institutions.

Improvements in productivity per employee seem to be more closely associated with changes in total assets after the merger than with there being a decline in the number of employees. The reason for it is that higher than average growth of assets is observed in many of the mergers in which there was an increase in productivity, at the same time as an increase in the number of employees. However, productivity per office is much more closely related to the change in the number of offices, since in 14 cases the fall in that number was reflected in an increase in productivity per office. This difference is due to the fact that changes in the number of offices are, in general, more far-reaching than staff changes.

22 Of all the cases analysed in which there was a fall in the number of employees after the merger (9 cases), only in one was the decline in staff almost entirely reflected in the operating costs. In addition, out of the eleven cases where a reduction in the number of offices took place, in four the reductions in the office network were almost completely reflected.

When comparing the changes in the number of employees and offices with the growth of total assets after the merger (see Tables A.2 and A.3), it is clear that in most cases in which after the merger there is an increase in market share neither the number of employees nor the number of offices decreases (4 cases against 2). Conversely, in all those cases in which there is a reduction in the number of employees and offices, except in one in which the result is uncertain, there is also a slowdown in the growth of total assets and losses of market share.

All this may indicate the existence of two types of mergers, those in which business expansion criteria predominate, which would be the first group (increase in share and more employees and offices) and others in which criteria of cost cutting and productivity increases predominate, which would make up the second group (reduction in staff and offices even at the expense of losses of market share). However, the differences between these two groups are not clear, since as commented above, the reductions in staff and offices are not always reflected in changes in operating costs, so that the differences between the two groups in the changes in their efficiency ratios are not very evident.

In certain cases, the rationalisation process had an inmediate effect on productivity ratios (in the year immediately following the merger), this effect gradually evaporating in subsequent years, as the number of offices or staff increases again. In these cases, the merger could have been used to undertake a rapid restructuring of the resulting institution and then to embark on an expansion. This outcome mainly occurs in mergers between savings banks, a group of institutions in which mergers took place between entities with a high degree of overlapping in their office networks. After merging a sharp fall in the number of offices, and to a lesser extent, in the number of employees can be observed -as a result of the reorganisation of the regional distribution network-. Afterwards, increases in these variables occur while plans for expansion into other regions are being implemented.

There does not seem to be a clear relationship between the previous level of efficiency of the institutions taking part in a merger and the values of the efficiency ratios in the subsequent period. Although, in general, mergers involving institutions which had higher efficiency levels subsequently show efficiency levels above those of the control group, some of the mergers involving institutions with efficiency levels below the average of the sector are those which then show better results in terms of efficiency (mergers 12, 8 and 13). This result may have a certain logic, since the possibility of achieving reductions in costs is greater in less efficient institutions, so that an improvement in the management stemming from the merger may give rise to rapid increases in the levels of efficiency of the institution.

Capital adequacy ratio

One element determining the possibilities for balance-sheet growth after mergers is the increase which mergers tend to produce in the value of the capital-adequacy ratio. In fact, as can be seen in table A.3, in 11 of the 18 cases analysed there was an increase in this ratio, of them 9 being significative. The results are even more clear if the situation of the last year prior to the merger is compared with the first after it, since then in 14 of the 18 cases analysed there was an increase in the capital-adequacy ratio. To a large extent, these increases are due to the incorporation into reserves of the capital gains arising from mergers, due to the revaluation of assets which were recorded on the books at historical cost. Although this is a purely accounting phenomenon, it enables banking institutions to widen the possibilities for growth by increasing the amount of eligible capital. This effect is even more important in the case of savings banks, a group of banking intermediaries which lack capital due to their special legal status. For them, the expansion of own resources has necessarily to be based on reserves growth and generated profits.

The fact that the value of the capital-adequacy ratio has decreased in several of the mergers analysed does not contradict the previous explanation, but it provides evidence of some institutions having taken advantage of the capacity for growth generated by the increase in capital.

Lastly, there appears to be a relationship between the increase in capital adequacy ratio and profit-generating capacity. Out of the 8 entities posting an increase in their net income as a percentage of average total assets, in 6 there was an increase in the capital adequacy ratio. Likewise, of the 9 cases where net income deteriorated, the capital adequacy ratio diminished in 5 instances. The improvement in entities' capital adequacy may have something of a positive influence on the cost of resources obtained from financial markets, thus contributing to increase the operating margins of those entities which experienced greater increases in their capital adequacy ratio.

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Table 1

SPANISH BANKING SYSTEM CONCENTRATION
(Total assets)

	1992		1998(a)	
	pta	%	pta	%
Deposit money institutions	94.337	100.0	133.537	100.0
Four big banks	28.153	29.8	65.506	49.1
Big ten	46.361	49.1	94.211	70.6

Source: Banco de España

(a) June

Table 2

MORTGAGE INTEREST RATE
(Banks and savings banks: incomplete panel)

	(1)	(2)	(3)	(4)
Variables				
FUS	-	-	-0.20	-
			(0.9)	
Overdue loans ratio (R)	0.01	-	-	-
	(0.9)			
Operating expenses	0.36	0.27	0.27	0.27
per asset unit	(7.8)	(3.2)	(3.3)	(3.1)
3-month interbank rate	0.90	0.95	0.95	0.95
	(78.7)	(54.2)	(54.4)	(54.1)
Spread (Debt-Interb.)	0.14	0.15	0.15	0.15
	(6.7)	(5.5)	(5.4)	(5.4)
Deposit rate dispers. (-1)	2.25	1.97	1.97	1.96
	(44.0)	(30.5)	(30.5)	(30.3)
[(" ")* FUS](-1)	-	-	-	0.09
				(1.6)
Variable transformation	**Diferences**	**Diferences**	**Diferences**	**Diferences**
Instruments	R (2, all) & X	-	-	-
Wald test	11,591 (5)**	3,810 (4)**	3,848 (5)**	3,978 (5)**
Sargan test	92 (35)**	-	-	-
Autocorrelation tests				
1st order	-4.4**	-2.6**	-2.6*	-2.6*
2nd order	-0.2	-1.7	-1.7	-1.7
Number of firms	128	128	128	128
Number of observations	758	758	758	758
Longest time period	1990-1997	1990-1997	1990-1997	1990-1997

Notes:
- The t-ratios are in brackets. Standard errors are robust to heteroskedasticity and serial correlation.
- One star means rejection of the null hypothesis at 5% signifcance level and two stars rejection at 1% significance level.
- Instruments used: all available lags of past-due loans ratio (R) dated at t-2 (see Arellano and Bond (1988)) plus the remaining regressors (X).

Table 3

INTEREST RATE OF DEPOSITS MATURING 1-2 YEARS
(Banks and savings banks: incomplete panel)

	(1)	(2)	(3)	(4)
Variables				
FUS	-	0.23	-	0.21
		(0.8)		(0.7)
Operating expenses	-0.20	-0.20	-0.21	-0.21
per asset unit	(2.6)	(2.7)	(2.8)	(2.8)
Government debt	0.79	0.79	0.80	0.79
rate (-1)	(35.5)	(35.2)	(35.2)	(34.6)
GDP growth	-0.27	-0.27	-0.27	-0.26
	(19.9)	(18.9)	(19.8)	(19.2)
Deposit rate	-2.19	-2.19	-2.20	-2.20
dispersion (-1)	(22.5)	(22.4)	(22.3)	(22.1)
[(")*FUS] (-1)	-	-	0.12	0.11
			(1.0)	(0.9)
Variable transformation	**Diferences**	**Diferences**	**Diferences**	**Diferences**
Instruments	-	-	-	-
Wald test	2,013 (4)**	2,062 (5)**	1,998 (5)**	2,095 (6)**
Sargan test	-	-	-	-
Autocorrelation tests				
1st order	-2.9**	-2.9**	-3.1**	-3.1**
2nd order	-0.2	-0.4	-0.4	-0.5
Number of firms	128	128	128	128
Number of observations	758	758	758	758
Longest time period	1990-1997	1990-1997	1990-1997	1990-1997

Notes: See notes in table II.1.1.

Basis points

A.1-PRE-TO-POST MERGER CHANGE IN PERFORMANCE RELATIVE TO CONTROL GROUP (a)

PROFIT GENERATING CAPACITY

Merger number	Bank or Savings bank	Acquiring firm more efficient	Total revenues in % ATA	Interest expenses in % ATA	Gross income in % ATA	Operating expenses in % ATA	Net income in % ATA
12	SB	No	93	-21	72	11	83
8	SB	No	-3	109	105	-26	79
9	SB	Yes(e)	-9	54	45	0	45
7	SB	Yes	-63	120	56	-22	34
13	SB	No	1	-17	-16	42	26
10	SB	No(d)	-26	57	31	-6	25
11	SB	Yes	9	-1	8	2	10
5 (b)	SB	Yes	-49	46	-4	9	5
15	SB	No	46	-51	-5	5	0
3	SB	Yes	-43	40	-3	2	-1
14 (b)	SB	No	8	-35	-27	18	-10
16	SB	Not clear	35	-58	-23	11	-12
2	B	No	66	-43	23	-42	-19
6	SB	Not clear	-4	-35	-39	19	-20
4 (b) (c)	SB	Yes (d)	-43	19	-23	-16	-39
18	B	No	29	21	51	-90	-40
17	B	Yes	-102	-13	-115	55	-60
1	B	Yes	-135	27	-107	36	-72
SUMMARY			8 better (4 SG) 10 worst (6 SG)	9 better (6 SG) 9 worst (4 SG)	8 better (4 SG) 10 worst (5 SG)	11 better (5 SG) 6 worst (4 SG) 1 no change	8 better (5 SG) 9 worst (5 SG) 1 no change

Source: BE
ATA: Average total assets SG: Significant change
Notes:
(a) The average value for the four years preceding the merger are compared with the average value for the four years after the merger in such a way that a positive sign indicates an improvement and a negative sign indicates a worsening
(b) Mergers between more than two firms
(c) In the post-merger period only three years were analysed due to data problems
(d) Refers to the biggest firm involved in the merger operation
(e) Slightly above efficiency ratios values of the control group

Basis points

A.2- PRE-TO-POST MERGER CHANGE IN PERFORMANCE RELATIVE TO CONTROL GROUP (a)

EFFICIENCY AND PRODUCTIVITY RATIOS

Merger number	Bank or Savings bank	Acquiring Firm more Efficient	Operating expenses in % ATA	Operating expenses in % TR	Operating expenses in % GI	Assets per employee	Assets per branch	Employees reduction	Branches reduction
12	SB	No	11	360	1137	206	-37	No	No
8	SB	No	-26	-226	778	-606	-1039	No(f)	No
9	SB	Yes(e)	0	-9	602	323	902	No	Yes
7	SB	Yes	-22	-367	276	-744	1486	Yes (g)	Yes
13	SB	No	42	331	588	1009	593	Yes	Yes
10	SB	No(d)	-6	-174	283	199	-357	Yes	Yes
11	SB	Yes	2	54	192	96	-305	No	No
5 (b)	SB	Yes	9	-36	216	699	2384	Yes	Yes
15	SB	No	5	-49	-56	-594	-798	Yes(h)	No
3	SB	Yes	2	-82	53	4264	2739	Yes	Yes
14 (b)	SB	No	18	97	-120	417	923	No(i)	Yes
16	SB	Not clear	11	156	-42	518	1394	No	No
2	B	No	-42	-244	-812	-130	587	Yes	Yes
6	SB	Not clear	19	162	-508	-626	-2959	No	No
4 (b)(c)	SB	Yes(d)	-16	-242	-588	153	842	No	Yes
18	B	No	-90	-971	-1216	-1780	-1302	Yes	Yes
17	B	Yes	55	230	-334	1359	3083	No	No
1	B	Yes	36	15	-521	1166	3461	Yes	Yes
SUMMARY			11 better (5 SG) 6 worst (4 SG) 1 no change	8 better (6 SG) 10 worst (6 SG)	9 better (4 SG) 9 worst (5 SG)	12 better (8 SG) 6 worst (3 SG)	11 better (10 SG) 7 worst (6 SG)	9 yes 9 no	11 yes 7 no

Source: BE
ATA: Average total assets TR: Total revenues GI: Gross income SG: Significant change
Notes:
(a) The average value for the four years preceding the merger are compared with the average value for the four years after the merger in such a way that a positive sign indicates an improvement and a negative sign indicates a worsening
(b) Mergers between more than two firms
(c) In the post-merger period only three years were analysed due to data problems
(d) Refers to the biggest firm involved in the merger operation
(e) Slightly above efficiency ratios values of the control group
(f) There is an increase in the first year after the merger and a reduction afterwards
(g) After the merger the number of employees decreased but it increased in the following years
(h) It increased in the last years of the post-merger period
(i) In the first year of the post-merger period there was a reduction in the number of employees

Basis points

A.3- PRE-TO-POST MERGER CHANGE IN PERFORMANCE RELATIVE TO CONTROL GROUP (a)

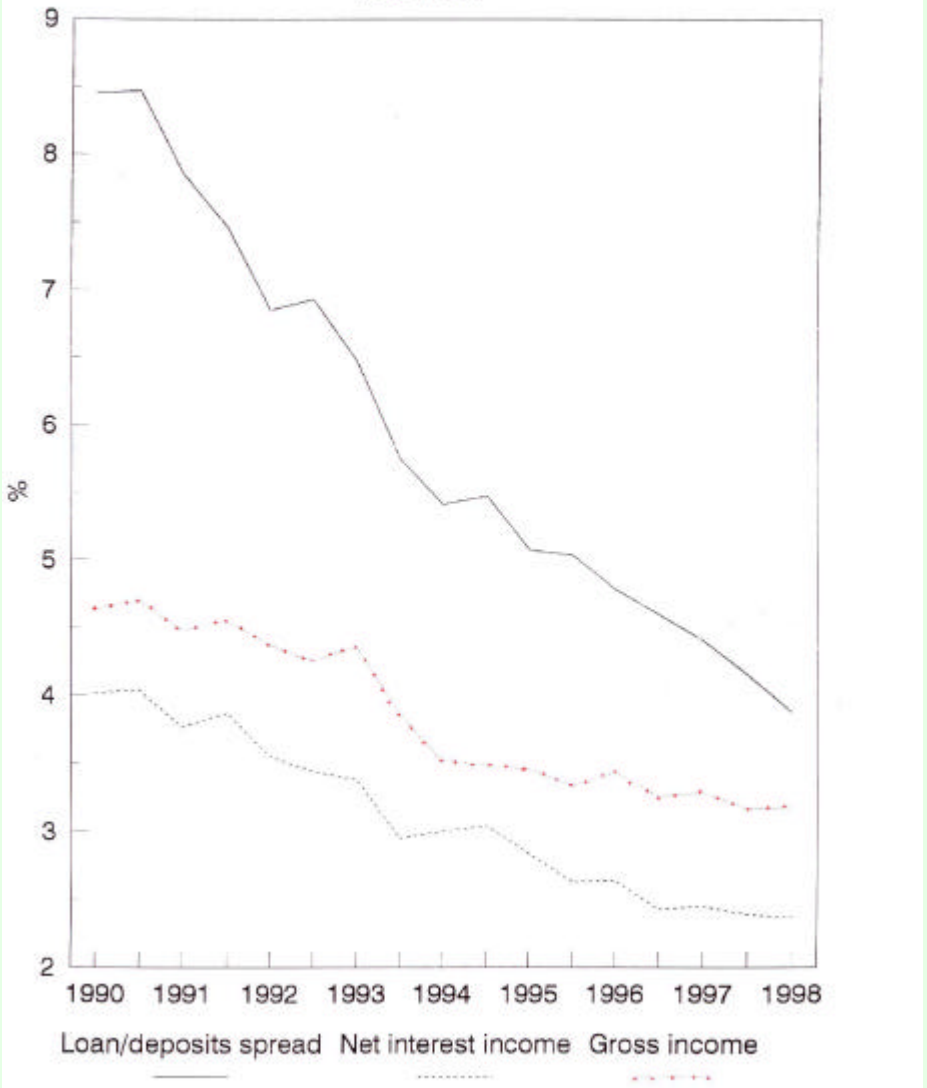
OTHER INDICATORS

Merger number	Bank or Savings Bank	Acquiring firm more efficient	Total assets growth rate	Market share	Loans and deposits in % of total assets (j)	Capital & reserves in % of total assets (k)
12	SB	No	Better	Better	-5	21
8	SB	No	Not clear	Worst(f)	1851	121
9	SB	Yes(e)	Better	Better	-784	440
7	SB	Yes	Worst	Worst	-196	182
13	SB	No	Not clear	Worst(g)	-181	-44
10	SB	No(d)	Worst	Worst	-197	161
11	SB	Yes	Better	Better	-667	-63
5 (b)	SB	Yes	Worst	Worst	-1162	277
15	SB	No	Worst	Worst	204	-32
3	SB	Yes	Worst	Worst (h)	-1658	160
14 (b)	SB	No	Worst	Better(i)	772	-21
16	SB	Not clear	Not clear	Better	-513	54
2	B	No	Worst	Worst	525	147
6	SB	Not clear	Worst	Worst	642	-46
4(b)(c)	SB	Yes(d)	Better	Better	142	9
18	B	No	Worst	Worst	-1224	203
17	B	Yes	Not clear	Better	-1574	-460
1	B	Yes	Not clear	Not clear	-819	-83
SUMMARY			9 worst 4 better 5 NC	10 worst 7 better 1 NC	6 increase (3 SG) 12 fall (8 SG)	11 increase (9 SG) 7 fall (4 SG)

Source: BE
NC: No change SG: Significant change
Notes:
(a) The average value for the four years preceding the merger are compared with the average value for the four years after the merger in such a way that a positive sign indicates an improvement and a negative sign indicates a worsening
(b) Mergers between more than two firms
(c) In the post-merger period only three periods were analysed due to data problems
(d) Refers to the biggest firm involved in the merger operation
(e) Slightly above efficiency ratios values of the control group
(f) The average value falls after the merger due to the evolution in the pre-merger period
(g) The drop was just after the merger, in the following years it recovers part of the lost share
(h) There is an improvement just after the merger but in the following years declines to levels below the pre-merger period
(i) There is an increase just after the merger which is lost in the following years
(j) Loans plus deposits in pesetas divided by total assets
(k) Capital, reserves and non-distributed profits divided by total assets

Graph 1

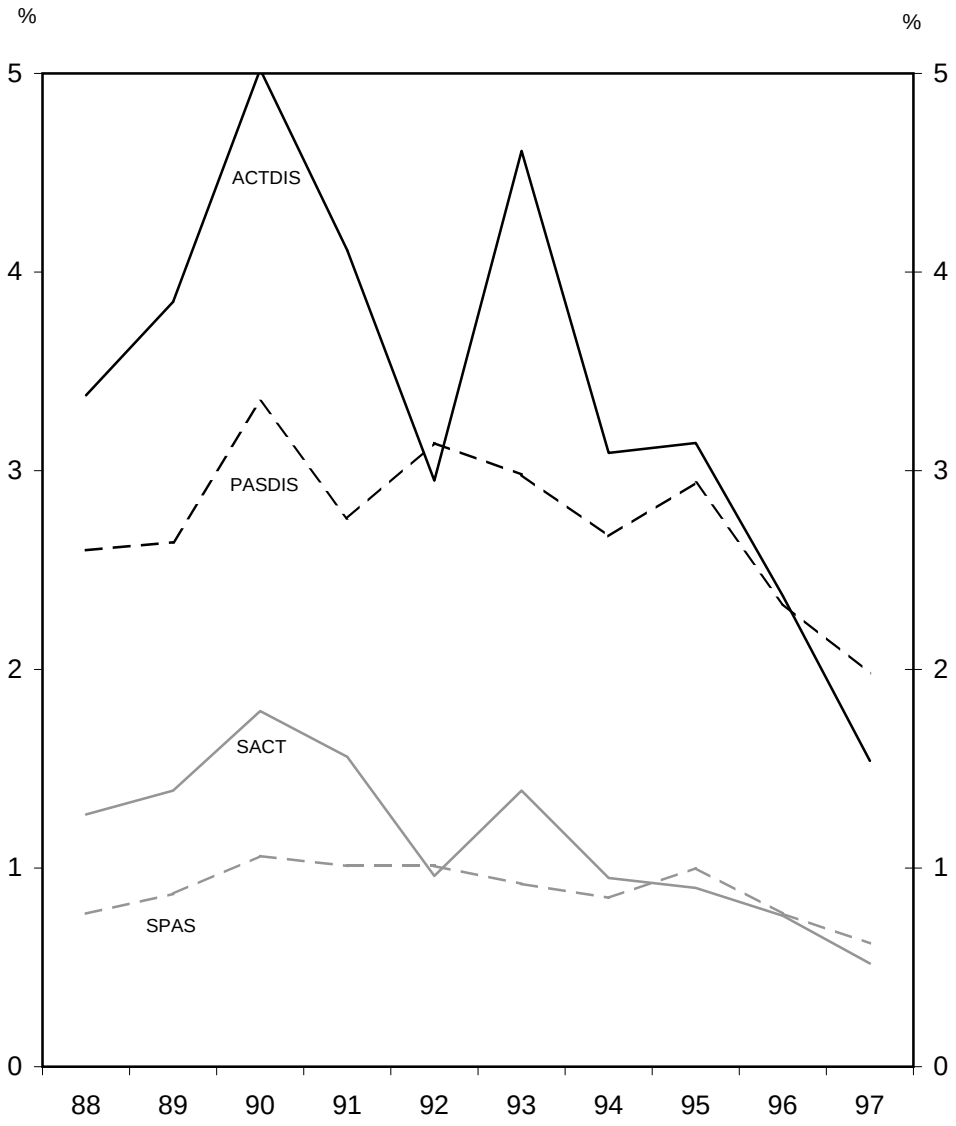
DEPOSIT MONEY INSTITUTIONS
EVOLUTION OF THE OPERATIONAL MARGINS (a)
1990-1998



(a) Net interest income and gross income in % of average total assets.

Graph 2

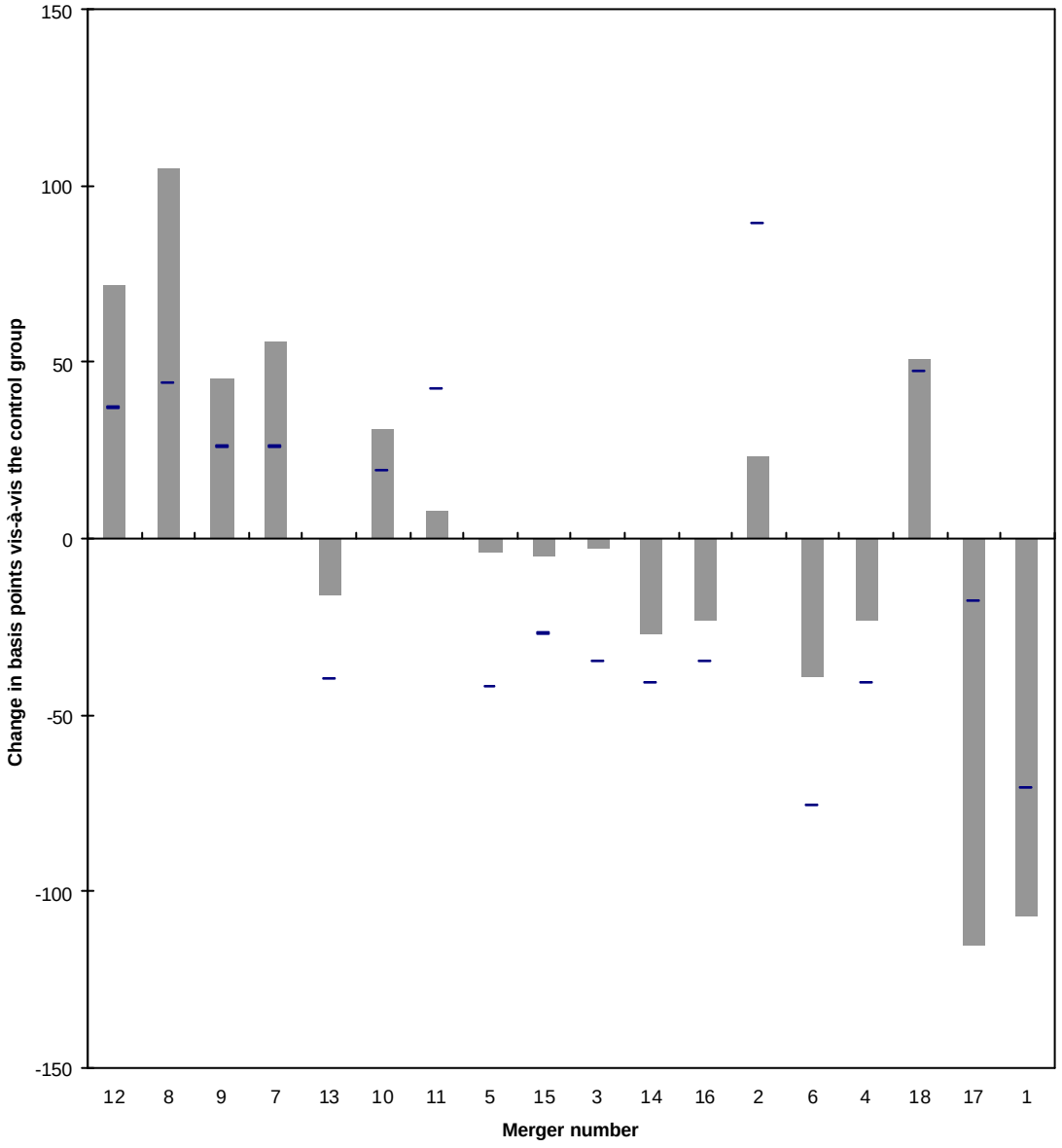
Bank interest rate dispersion



ACTDIS: difference between 95% and 5% decile of the mortgage rates distribution
PASDIS: difference between 95% and 5% decile of the term deposit rates distribution
SACT: standard deviation of mortgage rates distribution
SPAS: standard deviation of term deposit rates distribution

Gross income in % of ATA

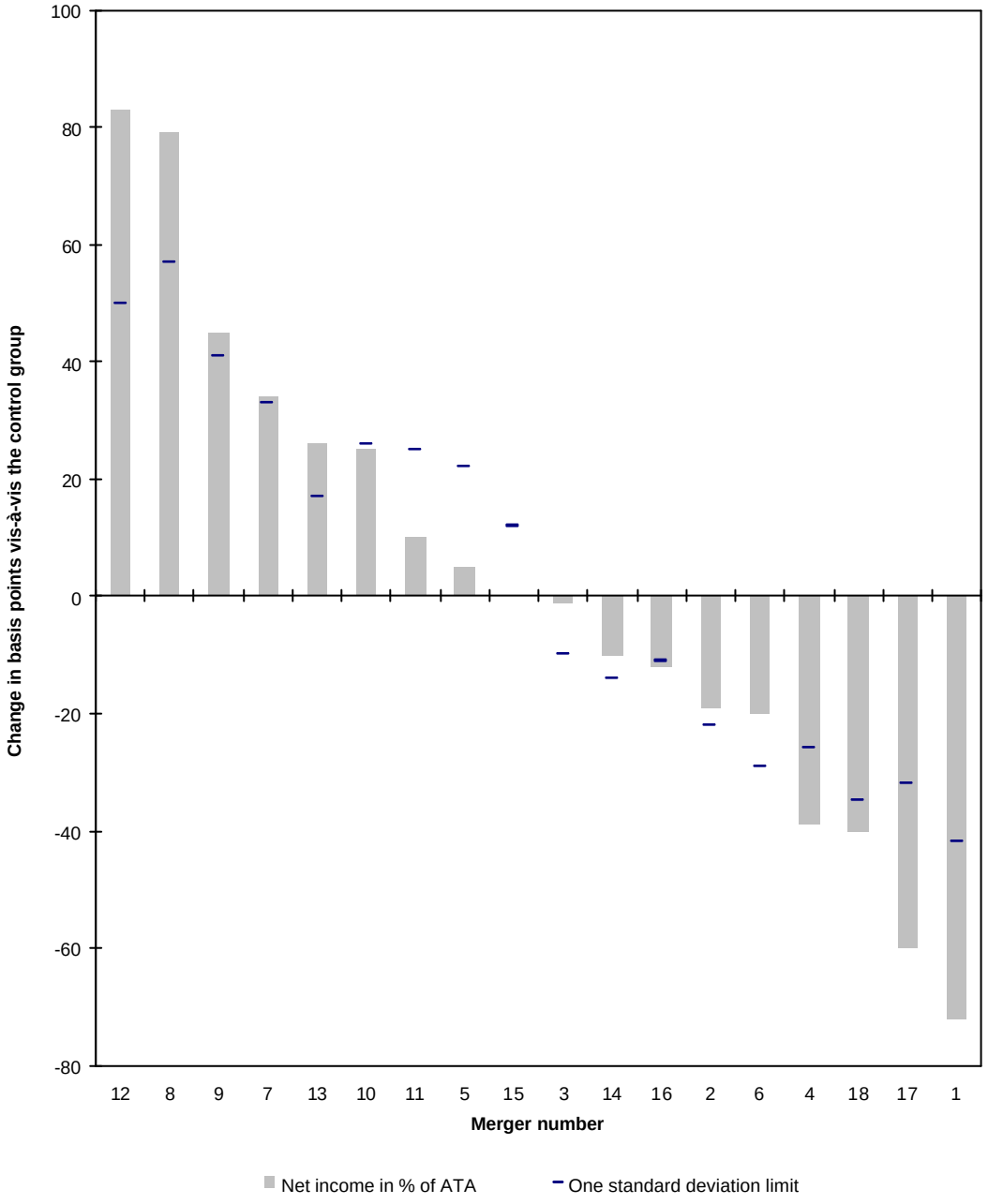
Graph 3



Note:
There is a significant improvement when the length of the bar exceeds the segment.

Net income in % of ATA

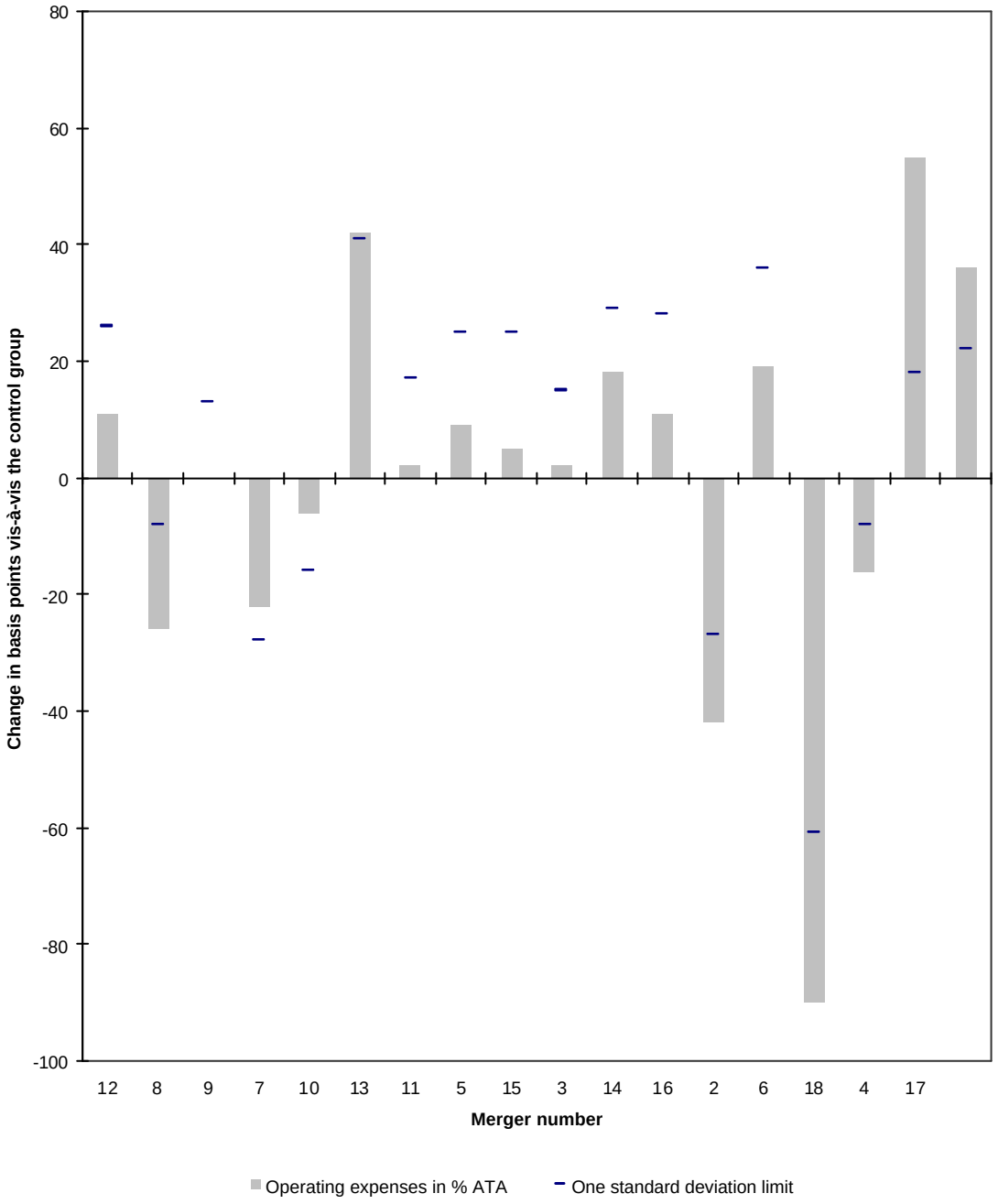
Graph 4



Note:
There is a significant improvement when the length of the bar exceeds the segment.

Operating expenses in % of ATA

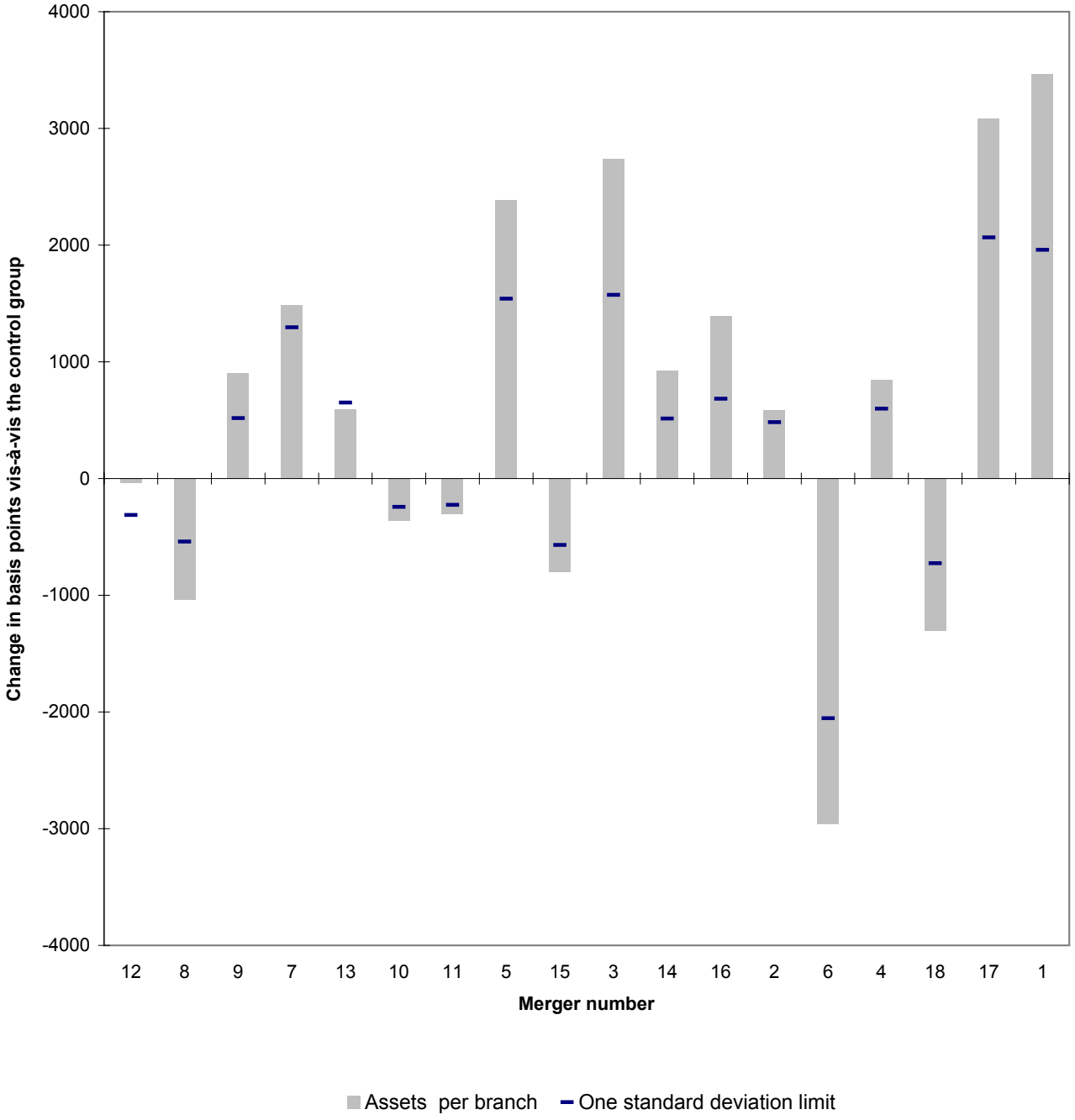
Graph 5



Note:
There is a significant improvement when the length of the bar exceeds the segment.

Assets per branch

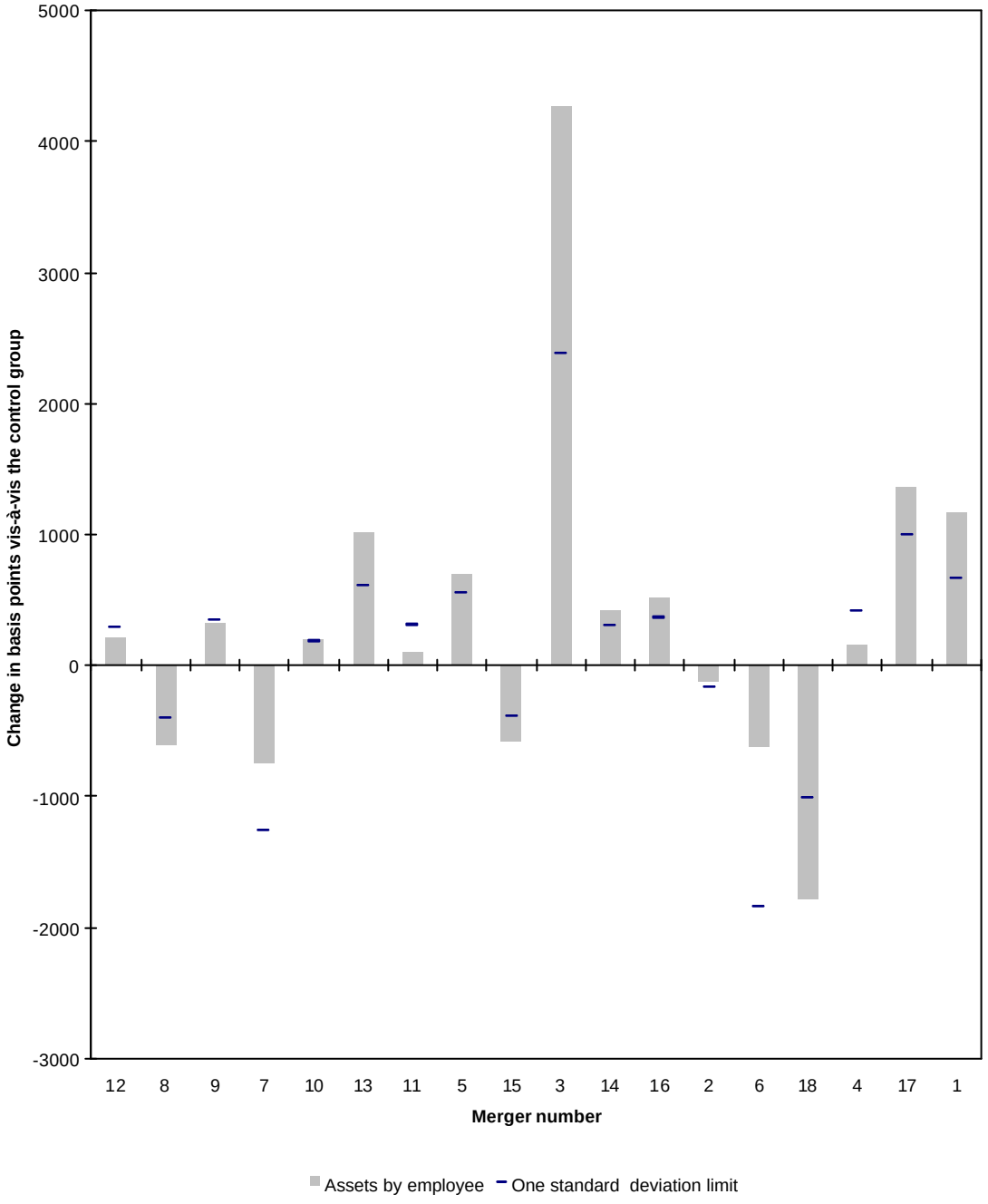
Graph 6



Note:
There is a significant improvement when the length of the bar exceeds the segment.

Assets per employee

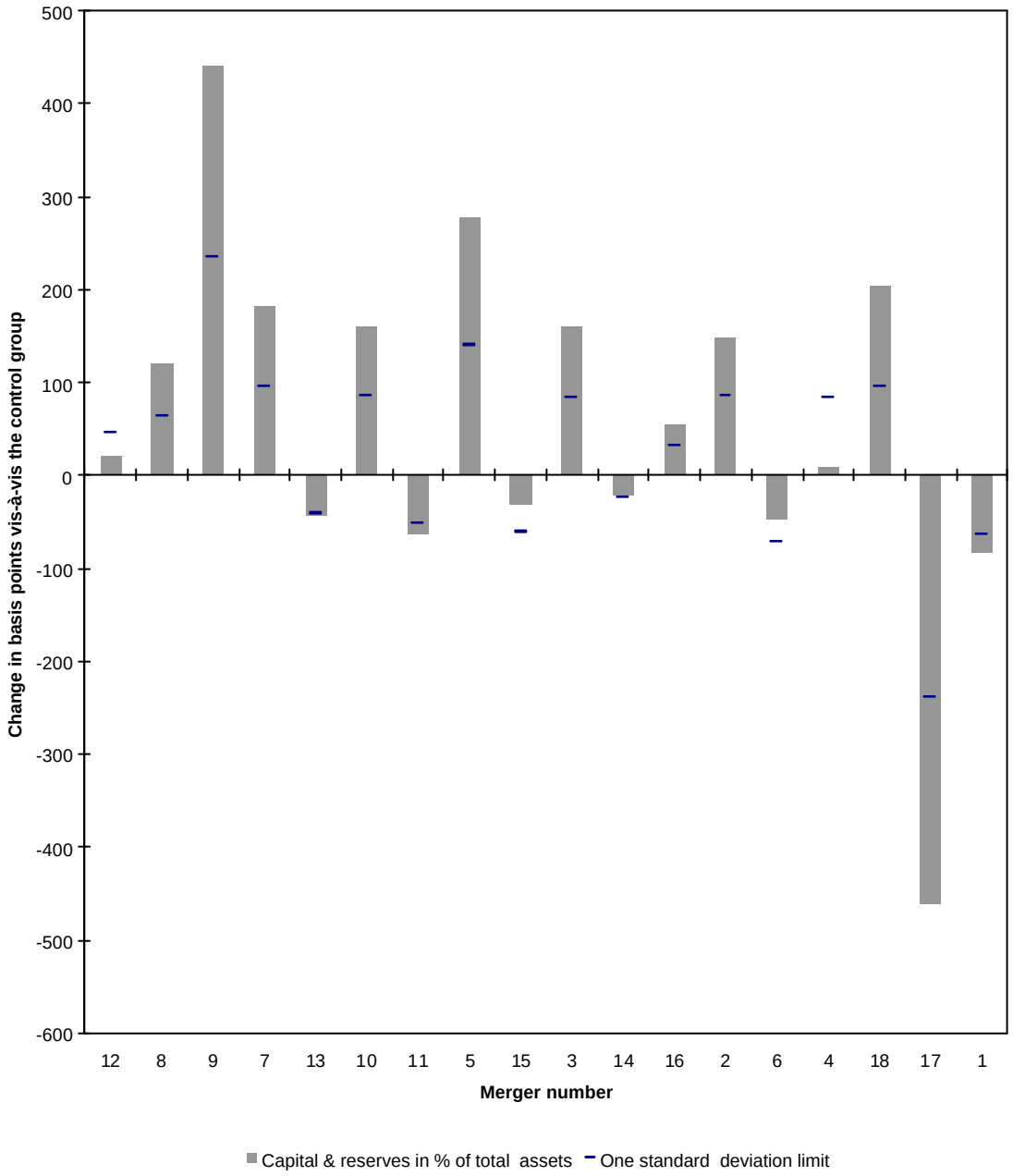
Graph 7



Note:
There is a significant improvement when the length of the bar exceeds the segment

Capital & reserves (% total assets)

Graph 8



Note:
There is a significant improvement when the length of the bar exceeds the segment