Growing to become European or European alibi for market power? An analysis of the Spanish banking mergers*

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Abstract

This paper begins to explore the incentives and effects of the Spanish wave of banking mergers and acquisitions which took place during the nineties. Using the independent local markets model, a series of results are stated for retail banking mergers: mergers are likely to be profitable, more profitable the more substitutable the networks of branches, and induce generalized price increases. An interest rates equation is estimated, which nests non-financial costs and markups. Results show that markups sharply increased in the second half of the nineties (about 1%), and more than the efficiency gains (which were 0.5%). To disentangle the impact of mergers from other likely explanations some counterfactuals must be completed.

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1. Introduction

A sharp deregulation and liberalisation of the Spanish banking industry took place during the eighties. And one of the results has turned out to be an important increase, during the nineties, of market concentration. In particular in retail banking, in which a wave of bank and savings bank mergers and acquisitions has played a prominent role. The biggest 5 banks accounted inmediatly befor 1990 for one third of loans, while today's 5 biggest entities (3 banks and 2 savings banks) account for nearly half. A process of mergers among the biggest banks has reduced their number to two, and a process of expansion and acquisitions led the two savings banks to enter the top ranking positions since the early nineties.

It has regularly been claimed that banking mergers help to increase efficiency and, in particular, to acquire the suitable size and efficiency level to compete in the increasingly unified European market. Facts, however, do not validate straightforwardly this aim as the main reason for all this merging activity. On the one hand, the domestic expansion of the activity of foreign banks, which deregulation tried to encourage, has been slow and modest. On the other, the biggest Spanish banks have not concentrated their entry efforts on Europe but on Latin America. Additionally, savings banks mergers and acquisitions partly preceded banks merging activity, and a somewhat different nature of these mergers can be conjectured. This highlights the interest of exploring the relative weight of the two classical merger effects and hence incentives on this merger wave: efficiency gains and market power.

Despite ATM's and e-commerce, branches continue to be important because of the local nature of retail banking. Networks of branches determine the structure of demand for the banking services of a particular bank and the impact of its competitors' prices and actions. And they also determine the structure of the non-financial costs of each particular bank. Drawing on these lines, a model can be constructed in which banks can naturally increase market power by merging their networks, more the more substitutive they are, and can also increase efficiency to the extent that network duplications are suppressed. The model is based on the independent markets modelling of the banking activity used in Jaumandreu

and Lorences (2002). This framework additionally allows for integrating behaviour into the analysis (i.e., the degree to which entities take into account the mutual externalities which their pricing generates).

This paper is an ongoing research aimed at exploring the incentives and effects of the mergers that occurred in the Spanish banking industry in the last decade, particularly the mergers among the biggest banks. Taking banks as competing in a product differentiated retail banking market with two main products (deposits and loans), using the bank demand and operative costs specification based on the independent local markets approach, pricing equations over time for all entities can be derived and specified (the independent entities and the entities born from mergers and acquisitions). Price equations nest a cost specification to be estimated simultaneously. Estimation of the equation parameters allow for the decomposition of the rate changes between market power and efficiency effects. The additional use of demand parameter estimates allows for constructing counterfactuals to assess the role of the merging activities on margins and costs.

The econometric exercise is carried out with the unbalanced panel consisting of the most important retailing entities operating in the Spanish banking market from 1990 to 2002. For the moment we model the market for loans, although the extension to the market for deposits is the next step of the research. We employ individual loan preferential rates, loan amounts, as well as detailed data on the structure of the networks of branches. Enough individual pre-merger and aggregated post-merger observations permit us to observe the fit of the data to the model and estimate the theoretical parameters.

The rest of the paper is organized as follows. Section 2 describes the banking industry context for the mergers and explains the sample used in this paper. Section 3 sketchs the relevant theoretical results on profitable mergers in markets with price competition throughout many independent local places. Section 4 is devoted to the econometric specification of an interest rate equation and the exploitation of the results obtained with its estimation. Section 5 briefly concludes.

2. A wave of mergers and acquisitions

This section is aimed at establishing the main facts about the banking industry which constitute the context of our analysis, and to justify and describe the particular sample we use.

Table 1 reports the main figures. Total banking entities, according to the bank of Spain, were 220 at the beginning of the nineties and 190 by 2002. But this is simply the number of registered legal entities, some of them without noticed activity and with hardly consistent data. A sample of 111 entities by 1990, which turns out to be reduced to 67 by 2002, accounts consistently for a overhelming stable fraction of retail banking (more that 80% of branches). We rely on this sample even to describe the evolution of the industry. In particular, although a few entries to and exits from this sample come from the starting or stopping of retail activities, and a few more involve acquisitions of extra-sample firms or sample disappearences because of extra-sample acquisitions, sample movements truly reflect the industry concentration.On the other hand, our sample consists both of banks and savings banks. The loans and deposits shares of this two types of entities, and their evolution over time, highlight the extent by which both entities have become equal competitors in the same activities.

Loans and deposits show a continuous increase in real terms during the whole period, but growth rates are highly reinforced since 1996 and 1999 respectively (see Figure 1). Loan defaults, a highly countercyclical variable,shows that after the 1993 downturn an economic boom began which lasts until the end of the period although weakened since 2000. The period shows a continuous decrease in the nominal rates. But Figure 2 detects a clear change, at the middle of the period, between the effective rates charged by banks and the interbank rate. Average margin increases, as we will confirm below more anallitically.

Table 2 reveals the importance of the merging wave. A really high number of entities were involved, although only a small fraction of the operations are enough to explain the main changes in concentration. Among them, there are the important savings banks mergers which took place by 1990 (whose concentration impact is not apparent because the series

start at this year), and the fundamental bank mergers of 1991, 1999 and 2000. The process of mergers among the biggest banks has reduced their number to two, and a process of expansion and acquisitions led two savings banks to enter the top ranking positions since the early nineties. The biggest entities were before 1990 five banks, but the biggest 5 entities by 2002 are 3 banks and 2 savings banks. The table and Figure 3 make clear the importance of the change in concentration and the fundamental role of the big mergers. It is important to notice that the savings banks mergers and acquisitions partly preceded banks merging activity, while a somewhat different nature can be conjectured. Savings banks still were at the beginning of the nineties geographically specialized entities. It is througout the process of mergers and acquisitions that this chaaracter is going to change slowly.

The industry form of coping with the extraordinary expansion of activity since the mid nineties has something new at first glance. Despite the associated expansion of the number of branches, the average number of branches by entity and the amount of loans by branch tend to increase significantly more rapidly than before.

3. Profitable mergers and pricing effects

We assume that (retail) banks compete across many small independent local markets setting unique interest rates. In these markets, banks open branches and compete on an equal footing for the supply for deposits and the demand for loans. We take each bank as a differentiated variety of the corresponding product (deposits, loans). Banks, however, broadly differ in the number of markets they are present. In particular, there are national banks, with a presence in most of the local markets, and there are regional and "city" banks, with a presence limited to parts of the territory. Assume for the moment, for the sake of simplicity, that local markets have identical size and that the unique banking activity are loans.

The demand for loans of bank i in local market k is given by the linear demand $l_{ik} = a - br_i + \sum_{j \neq i} dr_j$, where l stands for loans and r for loan interest rates. Hence, total

demand for bank i is given by the idiosyncratic expression

$$l_i = a_i - b_i r_i + \sum_{j \neq i} d_{ij} r_j$$

with $a_i = aK_i$, $b_i = bK_i$ and $d_{ij} = dK_{ij}$, where K_i is the number of markets in which bank i is present and K_{ij} is the number of local markets at which bank i meets bank j. Price effects (own and rivals' cross effects) depend on the presence of the bank across local markets, i.e. the number of local markets and the particular places in which the bank operates. But then, price effects, and hence short-run price competition, can be changed by modifying the network of branches in which the bank's retailing operation is based. We are going to show that modifying short-run price competition is one of the likely aims of bank mergers.

First, we must define mergers. By merging, banks f and g, say, become a unique entity f which sets the same price across markets. The new entity f possesses one branch in all local markets in which bank f or bank g were present, and two branches in the local markets they coincided. Assume that the merger does not change demand in the local markets where both banks were present (each branch keep its clients). Detailed modelling of a process of scrapping down the duplicity of branches in these markets at the cost of the fading of some of the advantages of product differentiation is possible, but for the moment we focus on short run effects. We also do not draw a sharp distinction on mergers and acquisitions. Bank f can be thought of acquiring bank g.

It is customary attribute mergers to two types of incentives: obtaining market power changes and efficiency gains. In the empirical part, we are going to assume that efficiency gains are based on the non-financial costs of bank activities, whose unit value can be potentially lowered as an effect of a merge. Leaving these efficiency gains aside for the moment, we want to answer two main questions in the context of our independent local markets modelling. Assume a common (financial and non-financial) marginal cost. Firstly, are there incentives for banks to merge? And if so, which banks? Secondly, what will happen to prices if some banks merge? For the moment, we are going to answer these questions assuming invariant Bertrand competition. Suppose this can be accepted for the initial situation. Even in this case the assumption can be sensibly criticized on the grounds that mergers open a

new choice set for conducts with new incentives.

To analyze the incentives to merge, let us begin by the local market implications of a merger. Deneckere and Davidson (1985) shown that, in a market with symmetric demands firms playing Bertrand, there is always an incentive for groups of firms to price together (to form "price coalitions") setting higher prices. The situation is different here in that banks with symmetric local demands set initially different rates (because they play Bertrand globally and no locally). But it is straightforward to show that the situation created by a merger implies that the merged firm has now a locally preferred price higher than the price which any integrating would had set before the merger. The local demand for the merged bank is

$$l_f = 2a - 2(b-d)r_f + 2\sum_{j \neq f,g} dr_j$$

and it is easy to see that Bertrand pricing at the local market level has increased. The reason is that the merger has increased local market power of the new entity with respect to the old f and g by suppressing local competition.

Now consider all markets together. Aggregated demand for the merged bank can be written as

$$l_f = a(K_f + K_g) - [b(K_f + K_g) - 2dK_{fg}]\, r_f + \sum_{j \neq f,g} d(K_{fj} + K_{gj})r_j$$

(notice that $K_{fg} = K_{gf}$). It is easy to show that, if $K_{fg} \neq 0$ (bank networks are not fully complementary), optimal price for the merged entity is higher than the weighted average of previous optimal prices for the merged banks, using market presence weights; i.e. $r_f^0 > [K_f/(K_f + K_g)]\, r_f + [K_g/(K_f + K_g)]\, r_g$. This implies that, if both banks had equal pre-merger rates, the merger will result in a price increase. And, in any case, in a higher average price. With equal costs, this implies higher unit profits and average unit profits respectively. This accounts for the demand side incentives to merge (notice that banks with fully complementary networks still can have cost side incentives to merge). On the other hand, as prices are strategic complements (reaction curves are upwardly slopped), unmerged firms will find optimal reacting by also setting higher prices, and the result from a merger will be an industry equilibrium with a higher prices level. This result can be seen as an

extension of the main Deneckere and Davidson (1985) theorem to an asymmetric context: mergers with Bertrand competition are profitable and will result in an increase of prices.

The previous result gives however no clue about which mergers are more profitable. With a totally unconstrained industry structure, the incentives for mergers can differ broadly among banks according to the pre-existing networks and schedule of coincidences. To situate a benchmark, however, we can assume some base industry structure. Suppose that banks are as heterogeneous in size (markets' presence) as we can wish, but located across the territory in such a way that the probability of finding a bank in a given local market is independent of the probability of the presence of another. With K markets, $s_i = K_i/K$ and $s = K_j/K$ are respectively the probabilities of finding banks i and j in a given location. With our "spatial independence" assumption, coincidences for i and j can be written as $K_{ij} = s_i s_j K$. This structure allows for obtaining a simple explicit solution for the equilibrium prices resulting from of a merger.

Suppose zero marginal cost for notational simplicity. Branches market structure show spatial independence. Assume bank f competes across the K markets setting its optimal (Bertrand) price r_f. This price is given by

$$r_f = \frac{a}{2b - (2b + ds_f)D_f}$$

where $D_f = \sum_{j \neq f} \frac{ds_j}{2b+ds_j}$. Assume now that bank f merges with bank g. Optimal price for the merged entity f, which is present in $(s_f + s_g)K$ markets, and possesses two branches in $s_i s_j K$ markets, is

$$r_f^{\emptyset} = \frac{a}{2(b - 2d\theta) - [2(b - 2d\theta) + d(s_f + s_g)]\, D_f^{\emptyset}}$$

where $D_f^{\emptyset} = \sum_{j \neq f,g} \frac{ds_j}{2b+ds_j}$ and $\theta = \frac{s_f s_g}{s_f + s_g}$. And the price of any other un-merged firm is now

$$r_i^{\emptyset} = \frac{a}{2b - (2b + ds_i)D_i^{\emptyset}}$$

where $D_i^{\emptyset} = \sum_{j \neq i,f,g} \frac{ds_j}{2b+ds_j} + \frac{d(s_f+s_g)}{2(b-2d\theta)+d(s_f+s_g)}$. It is not difficult to show that, as expected, $r_f^{\emptyset} > r_f$ and $r_i^{\emptyset} > r_i$. It can be also shown that the size of the price increase of the merged

firm will be directly related to θ, a measure of the complementariness of the networks. The intuition is clear, the higher is θ the more important is the suppressed competition.

With a completely unrestricted market structure, it is not possible to obtain straightforward expressions for the post-merger prices and unit profits. But, given estimates of the demand parameters (and cost performance), counterfactual exercises can be easily performed. Assume there are N banks and write the vector of N demands as $l = a + Br$, where B stands for the matrix of price (own and cross) effects. Using c for the vector of costs, Bertrand equilibrium FOC conditions can be written as

$$r - c = -(diagB)^{-1}l$$

and either price or markup estimates can be obtained by replacing l by its expression and using the formula

$$r - c = -(diagB + B)^{-1}(a + Bc)$$

Different a, B (and cost) specifications, with different dimensions according to the (pre or post) number of banks, give the desired results. These exercises can answer the questions as: what would had been the prices if the merger had not taken place?, or, what will be the likely prices if this particular merge takes place? In addition to the underlying independent markets model and the demand parameters, only some minor auxiliary assumptions are needed to obtain the results. The post-merger evolution of branches must be undo backwards, or simulated in the forward-looking exercises. Notice that all market price interactions (merged and un-merged firms) are taken into account. And the combination of the two type of questions sets a powerful test for the model itself and its estimation: do have really taken place the mergers which the model detects as the most likely?. The framework can be carried further on to accommodate possible non-Bertrand behaviors or behavior changes triggered by mergers (see Jaumandreu and Moral, 2003).

4. Econometric specification and results

In this section we firstly derive and estimate a loans interest rate equation, specified according to the insights of the independent markets model of section 3. Using these

estimates, we then assess the evolution of marginal costs and markups, both for the whole sample and performing relevant sample separations, as in pre-merger/acquisition (pre-M/A) and post-merger/acquisition (post-M/A) observations. This gives us some first insights on the likely motives and effects of mergers. Finally, we try to assess the incentives and impact of mergers by looking at a series of couterfactual exercises.

4.1 A loans interest rate equation

The Bertrand equilibrium FOC for bank i can be written (dropping time subscripts) as

$$r_i = i^e + c(z_i) + \frac{1}{b_i} q_i$$

where i^e is expected financial cost of loans (the relevant interbank rate), $c(.)$ stands for non-financial costs, depending on some observable vector of variables z , and $\frac{1}{b_i} q_i$ represents the markup ($\equiv m_i$) which the bank charges over costs. Marginal non-financial cost c and the markup m are unobservable, but they can be estimated by suitably specifying them. We are going to use three cost arguments: a measure of the risk involved in the bank loans, a measure of the bank management costs, and the size of the network of branches measured by their number. And we are going to estimate b_i by specifying $b_i = bK_i$, where K_i is a (weighted) measure of the bank presence throughout the local markets. By using the observed variable q_i/K_i we can limit ourselves to estimate the value $1/b$. After estimating the parameters of this price equation, we are going to use the estimated $\widehat{m}$ and $\widehat{c}$ to infer the evolution of margins and efficiency.

We assume the following empirical model

$$r_{it} = \beta_0 i_{t+1} + \beta_1 Risk_{it} + \beta_2 Mcost_{it} + \beta_3 Branches_{it} + \beta_4 (NewLoans/K)_{it} + \eta_i + \varepsilon_{it}$$

where η accounts for time invariant (zero mean) bank idiosyncratic differences in the interest rates (linked, for example, to loan composition unobserved particularities), and ε is a zero mean disturbance. We maintain specific assumptions on the correlation of η and ε with the explanatory variables. Let us comment with detail this specification and the econometric strategy to estimate it.

Expected financial cost is represented by a lead of the interbank rates. On the one hand, interbank rates are the right variable for the marginal financial cost of funds under the

common assumption of separability of loans and deposits (see, for example, Freixas and Rochet,1997). On the other, one lead seems a sensible specification for this cost during a period in which variable interest loans have generalized (Jaumandreu and Lorences use, however, a polynomial in anticipations for a period in which fixed rates loans were prevalent). We expect β_0 be in fact unity, what can be taken as a test for the validity of the specification. The interest rate observed at $t+1$ has been substituted for the expectation, and hence surprises are included in the error term ε. To avoid the effects of correlation between i_{t+1} and ε_{it} we use the interbank rate lagged one period as instrument .

We measure risk by the accounting defaults reported by the bank as a proportion of the total bank loans. Recall that this is a highly countercyclical variable, which shown a peak in 1993 and relative low values throughout the strong subsequent expansion period (first decreasing until 1998 and then increasing again). And we measure the percentage points attributable to management costs by using the ratio of total operative costs of the bank (wages plus other current expenses) to the sum loans plus deposits. If loans typically imply a lower proportion of the bank operative costs than the management of deposits we must expect for this variable a coefficient under unity. The levels of the variables *Risk* and *Mcost* are likely to be correlated with the idiosyncratic effect η but we assume them to be orthogonal to ε . Accordingly, to avoid the endogeneity bias we use as instruments the contemporaneous differences of the same variables.

The size of the network of branches is likely to imply a quasifixed cost, independent of the level of operation, which must be taken into account (see Cuesta and Orea, 2002, and Carbó and Humphrey, 2004, for exercises in the specification of Spanish bank and savings banks cost functions). We include branches linearly, but we test for possible additional effects. Notice that a linear unit cost effect of branches imply diseconomies of size. If mergers serve among other things, as sometimes has been argued, to undertake a restructuring and rationalization of the merged networks, the estimation of this branches' effect is a key cost piece to assess efficiency gains afterwards. We take *Branches* as a variable orthogonal to η and ε, which does not need to be instrumented.

Finally, we have to specify the key variable *New Loans/K.* New loans must be an estima-

tion of the loans yearly renewal relevant from the demand side point of view (an opposed to the whole stock of loans). To specify it, we draw for the moment on the thorough demand for loans estimation carried out in Jaumandreu and Lorences (2002). According to their average dynamic estimate, we use $L_t - 0.81L_{t-1}$, where L stands for the stock of loans. On the other hand, K must be a proper measure of the bank presence across local markets. We use the number of branches at each of the administrative divisions (51 provinces), weighted by an index corresponding to the share in GDP of the administrative division (we normalize the weights by dividing by the value of the province with the lowest share). Results turn out to be very robust to changes in these specifications. *New Loans* is an estimate of the relevant demand and hence a fully endogenous variable in the rates equation (both η and ε are likely to be correlated with the demand equation disturbances). We use as instrument for the whole variable *New Loans/K* our measure K, consistently with our exogeneity assumption on the variable *Branches*.

Table 3 reports useful information on the specification, estimation and fit of the interest rate equation. Regression 1 only partially specifies the equation (management and quasifixed costs are not included) and treats *New Loans/K* as an exogenous variable. Endogeneity is heavily accused by the Sargan test of overidentification restrictions. Regression 2 instruments the variable with the ratios $1/K_t$ and $1/K_{t-1}$, obtaining a dramatic improvement in the Sargan test. Regression 3 shows that another potential instrument, rivals' rates weighted by coincidences across markets, is not performing well. The Sargan test points out that some endogeneity is present, what is a sensible question given the interdependence of the price setting. Regression 4 includes management costs. The coefficient is sensible and its instrumentation works. Regression 5 includes the variable *Branches* as a component of costs, obtaining a further improvement in the equation fit. This is our preferred estimate. Regressions 6 and 7 performs some robustness checks. Regression 6 makes clear that there is no additional effect of branches. Regression 7 shows that the use of a lead on the interbank rate is preferable on the use of the contemporaneous value. The value of the standard error of the equation residuals (1.91) of equation 5 is less than 20% of the average interest rate, showing that the equation explains an important part of the variance of the rates.

4.2 Describing margins and efficiency

We use the results of regression 5 to obtain estimates of markups $\widehat{m}$, and of non-financial costs $\widehat{c}$. Table 4 reports the (yearly and total) sample means and standard deviations of $\widehat{m}$ and $\widehat{c}$. Figure 4 depicts the normalized evolution of efficiency (minus cost changes) and markups. Let us comment the main results.

Firstly, the evolution of markups clearly shows two different moments. From 1990 to 1995, average markups show relative stability around a value not far from 1 percentage point, from 1995 to 2002 markups tend to increase steadily (their sample standard devition also increases, but notice that the coefficient of variation remains roughly the same). Markups gain on average 1 percentual point (they double their value). Therefore, the wave of mergers and acquisitions appears associated to an important increase in interest rates and unit profits, but this increase only materializes in the second part of the nineties.

Secondly, average non-financial costs tend to increase up to 1993, heavily influenced by the evolution of risks, and then decrease. As the role of risk is roughly the same at the beginning and at the end of the whole period (see Table 1), it seems sensible to measure the underlying efficiency gain as the approximate 0.5 percentual point which gives the difference between the last and the first considered years (and also the values between the years 2002 and 1995). Hence the wave of mergers also appears associated to an important increase in efficiency which, however, seems to be roughly half of the increase in markups.

Finally, the more detailed figures of Table 5, obtained by averaging markups and costs for relevant subsamples, give additional insights on the likely relationships among mergers, markups and efficiency. On the one hand, a small increase in both markups and efficiency seems to be present in the first part of the decade for the savings banks. Interestingly enough, this part of the period was dominated by the mergers and acquisitions among savings banks, which raised some big merged savings banks from small specialized ones with mostly complementary networks. On the other hand, it turns out to be that the gains in margins and efficiency during the second part of the decade are spread across all the sample, with minor differences between banks and savings banks and pre-M/A and post-M/A observations. Notice that this is fully consistent with our theoretical framework,

in which anybody ends by increasing prices as the effect of a few mergers. Interestingly enough, this period is the period dominated for the mergers of the few biggest banks with highly substitutable networks. Finally, it is interesting to note that post-M/A observations do not show a significantly higher increase in efficiency with respect any other subsample.

4.3 Assessing the impact of mergers

In summary, in the second part of the decade, and in opposition to which happened in the first, there is a clear increase in market power in the loans market, of about a percentage point, which exceeds the increase in efficiciency by half a percentage point. This fact could be consistently explained by the change in the nature of the banking mergers which crowd the decade, from the "growth-aimed" savings banks mergers, carried out among entities with complementary networks, to the likely more "market-power" oriented mergers among the biggest banks, with high substitutable networks, at the end of the decade. But there are also other possible explanations. Everything could be the sole expression of procyclical pricing, with all margins stimulated by the economic boom since 1996.Or it could be the expression of a change in conduct in the loans pricing, towards a less agressive behavior, not particularly related to the process of mergers. To try to disentangle these alternatives, we need the insights provided by the couterfactual exercises.

(To be completed)

5. Conclusions

This paper is an ongoing research aimed at exploring the incentives and effects of the mergers that occurred in the Spanish banking industry in the last decade, particularly the mergers among the biggest banks. Taking banks as competing in a product differentiated retail banking market, using the bank demand and operative costs specification based on the independent local markets approach, pricing equations over time for all entities can be derived and specified (the independent entities and the entities born from mergers and acquisitions). The theoretical framework indicates that there are profitable mergers and that mergers will induce generalized price increases. An interest rates for loans equation

has been estimated , nesting non-financial costs and markups. Results show that markups sharply increased in the second half of the nineties (about 1%), more than the efficiency gains (1/2%). To disentangle the impact of mergers from other likely explanations some counterfactuals must be completed.

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Table 1. The Spanish retail banking industry 1990-2002
Basic variables

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Total banking entities[a]	220	217	218	215	217	221	216	210	203	196	189	192	190
Entities in sample	111	102	100	98	94	93	89	86	83	79	72	70	67
Banks	47	47	47	47	43	43	39	36	33	30	25	24	21
Savings banks	64	55	53	51	51	50	50	50	50	49	47	46	46
Sample branches/Total branches[a]	0.81	0.83	0.82	0.83	0.83	0.83	0.82	0.83	0.81	0.81	0.85	0.84	0.83
Loans[b]	235.5	255.9	268.6	269.3	276.3	285.3	307.1	346.6	392.1	429.0	526.4	568.6	603.6
Banks loans/Loans	0.60	0.59	0.56	0.55	0.53	0.52	0.52	0.51	0.50	0.48	0.51	0.50	0.48
Savings banks loans/Loans	0.40	0.41	0.44	0.45	0.47	0.48	0.48	0.49	0.50	0.52	0.49	0.50	0.52
Deposits[b]	365.5	373.1	380.1	404.3	414.3	446.0	455.1	476.2	482.8	496.5	578.7	628.1	644.0
Banks deposits/Deposits	0.54	0.52	0.50	0.50	0.49	0.50	0.49	0.49	0.47	0.45	0.48	0.48	0.46
Savings banks deposits/Deposits	0.46	0.48	0.50	0.50	0.51	0.50	0.51	0.51	0.53	0.55	0.52	0.52	0.54
Interbank rates[c] (%)	15.4	13.1	13.3	10.9	8.4	10.0	7.4	5.2	4.0	3.2	4.8	4.1	3.5
Loan rates + percentage commisions[d] (%)	13.9	13.9	13.7	12.8	9.8	10.0	9.3	7.7	6.8	5.6	5.7	6.2	5.9
Loan defaults[e] (%)	0.9	1.3	1.7	2.6	1.6	0.8	0.3	0.4	0.0	0.2	0.5	0.6	0.8
Variable rate loans[a] (%)	-	-	24.3	26.1	38.8	34.9	37.1	40.5	44.4	43.6	49.5	57.1	59.8

[a]Bank of Spain. A dot indicates non-available data.
[b]Sample total. Thousands of million euros of 2002.
[c]Interbank market for non-transferable deposits, 1 year, Bank of Spain.
[d]Sample mean.
[e]Sample proportion.

Table 2. The Spanish retail banking industry 1990-2002
Evolution of market structure

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Total
Entities in sample	111	102	100	98	94	93	89	86	83	79	72	70	67	
Branches	28529	28902	29252	29335	29456	30193	30814	31679	31468	31799	33283	32782	32479	
Mergers[a]														
Banks mergers		1								1	1			3
Savings bank mergers	7	2	1											10
Acquisitions[a]														
Bank acquires bank				2	3	1						1	3	10
Savings bank acquisitions		3		2		1	2	2	3	1	2	1		17
Total operations	7	6	1	4	3	2	2	2	3	2	3	2	3	40
Involved entities[b]	19	15	3	8	7	4	4	4	4	4	12	4	6	94
Loans Concentration														
CR2 (%)	17.7	22.7	21.6	22.0	22.0	20.9	20.8	19.9	19.8	26.9	33.6	31.9	29.3	
CR5 (%)	38.4	43.2	42.6	42.3	42.4	41.4	42.7	42.7	44.1	48.0	53.7	52.1	50.3	
CR10 (%)	55.5	57.3	57.3	57.0	57.2	56.8	57.9	58.1	59.7	61.8	67.2	66.2	65.1	
Branches by entity	257	283	293	299	313	325	346	368	379	403	462	468	484	
Loans by branch[c]	8.2	8.9	9.2	9.2	9.4	9.4	10.0	10.9	12.5	13.5	15.8	17.3	18.6	
Average geographical presence[d]														
Banks (%)	40.1	39.6	40.0	40.1	40.9	40.9	41.2	43.0	43.3	42.1	42.4	43.1	45.6	
Savings banks (%)	10.4	12.2	12.9	13.5	14.7	15.1	16.0	16.4	17.9	19.0	21.8	23.6	24.7	

[a]Mergers and acquisitions involving one or more sample entities.
[b]Includes entities outside the sample.
[c]Million euros of 2002.
[d]Geographical presence measured as the proportion of the 51 administrative divisions or provinces in which the entity is present.

Table 3. Interest rate equation estimates

Dependent variable: (Loan rate + percentage commission)$_{it}$
No. of entities: 124
Sample period: 1990-2002
Observations: 1099
Method: IV[a]

Explanatory variables[b]	1	2	3	4	5	6	7
Interbank rate$_t$							0.84
							(34.8)
Interbank rate$_{t+1}$	1.15	1.05	1.07	0.94	0.94	0.94	
	(69.1)	(62.1)	(66.9)	(26.5)	(28.0)	(27.0)	
Risk$_{it}$	0.36	0.22	0.28	0.17	0.18	0.18	0.07
	(3.6)	(4.1)	(4.3)	(2.9)	(2.9)	(2.8)	(2.3)
Mcost$_{it}$				0.67	0.64	0.66	0.59
				(3.6)	(3.7)	(3.7)	(4.3)
Branches$_{it}$					0.58	0.49	0.54
					(6.7)	(1.4)	(6.3)
Branches$_{it}^2$						0.04	
						(0.3)	
(New Loans/K)$_{it}$	3.09	8.96	7.49	6.39	5.82	5.82	5.83
	(7.3)	(9.1)	(9.2)	(7.0)	(6.9)	(6.6)	(7.8)
Instruments:							
Constant, I. rate$_{t-1}$, ΔRisk$_{it}$, plus	(New Loans/K)$_{it}$	$\frac{1}{K_{it}}$, $\frac{1}{K_{it-1}}$	$\frac{1}{K_{it}}$, $\frac{1}{K_{it-1}}$, $\sum_{j\neq i} K_{ijt} r_{jt}$	$\frac{1}{K_{it}}$, $\frac{1}{K_{it-1}}$, ΔMcost$_{it}$	$\frac{1}{K_{it}}$, $\frac{1}{K_{it-1}}$, ΔMcost$_{it}$, Branches$_{it}$	Same as 5 + Branches$_{it}^2$	Same as 5
Statistics:							
Dependent variable mean 9.68							
σ^2	4.80	5.99	5.36	3.93	3.64	3.64	2.37
Sargan test[c]	59.6	2.79	21.58	2.99	1.43	1.55	0.71
(degrees of freedom)	(1)	(2)	(3)	(2)	(2)	(2)	(2)

[a] T-ratios in parenthesis, computed from standard errors robust to heteroskedasticity and autocorrelation.
[b] Risk = Loan defaults/Loans; Mcost = Management costs/(Loans + Deposits).
[c] Two-step Sargan test.

Table 5. Markup changes and efficiency gains
(percentage points)

		Markup and cost averages				Markup and (minus) cost changes	
	No of observations	1990	1995	2002	1990-2002	1990-1995	1995-2002
ions							
ies	1099						
ps		0.85	0.90	1.93	1.18	0.05	1.03
ancial costs		1.79	1.71	1.23	1.65	0.08	0.48
	457						
ps		0.69	0.54	1.42	0.79	-0.15	0.88
ancial costs		1.90	1.95	1.49	1.91	-0.05	0.46
anks	642						
ps		0.97	1.18	2.16	1.46	0.21	0.98
ancial costs		1.71	1.53	1.12	1.46	0.18	0.41
servations	905		[a]				
ps		0.85	0.82	1.85	1.06	-0.03	1.03
ancial costs		1.79	1.67	1.14	1.65	0.12	0.53
bservations	194		[a,b]				
ps		1.15	1.21	2.07	1.72	0.06	0.86
ancial costs		1.60	1.87	1.41	1.62	-0.27	0.46

: al entities' observations before the entity is involved in a merger or acquisition. Post M/A: observations complementary to Pre M/A.

in the 1990 column correspond to 1991.

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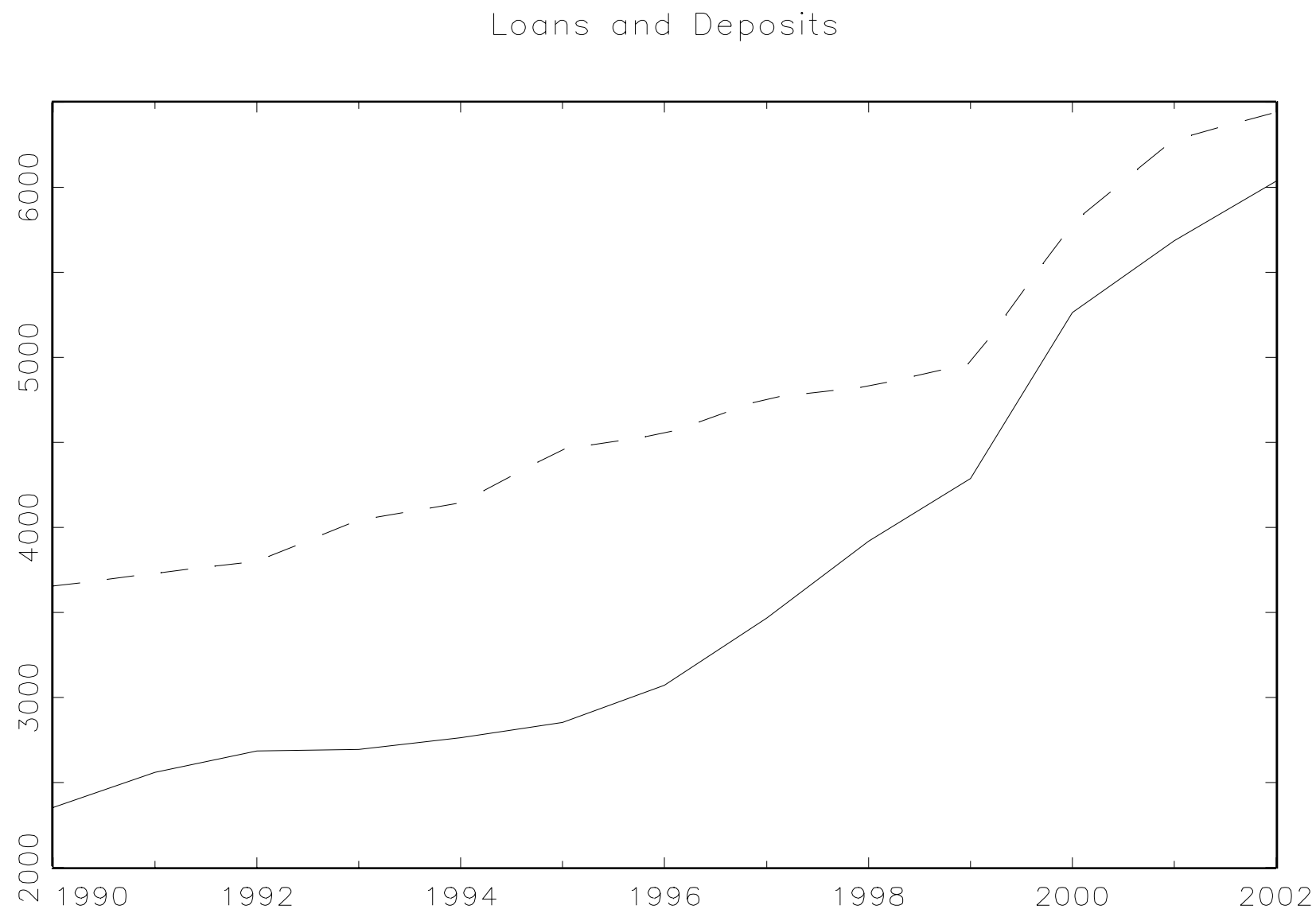

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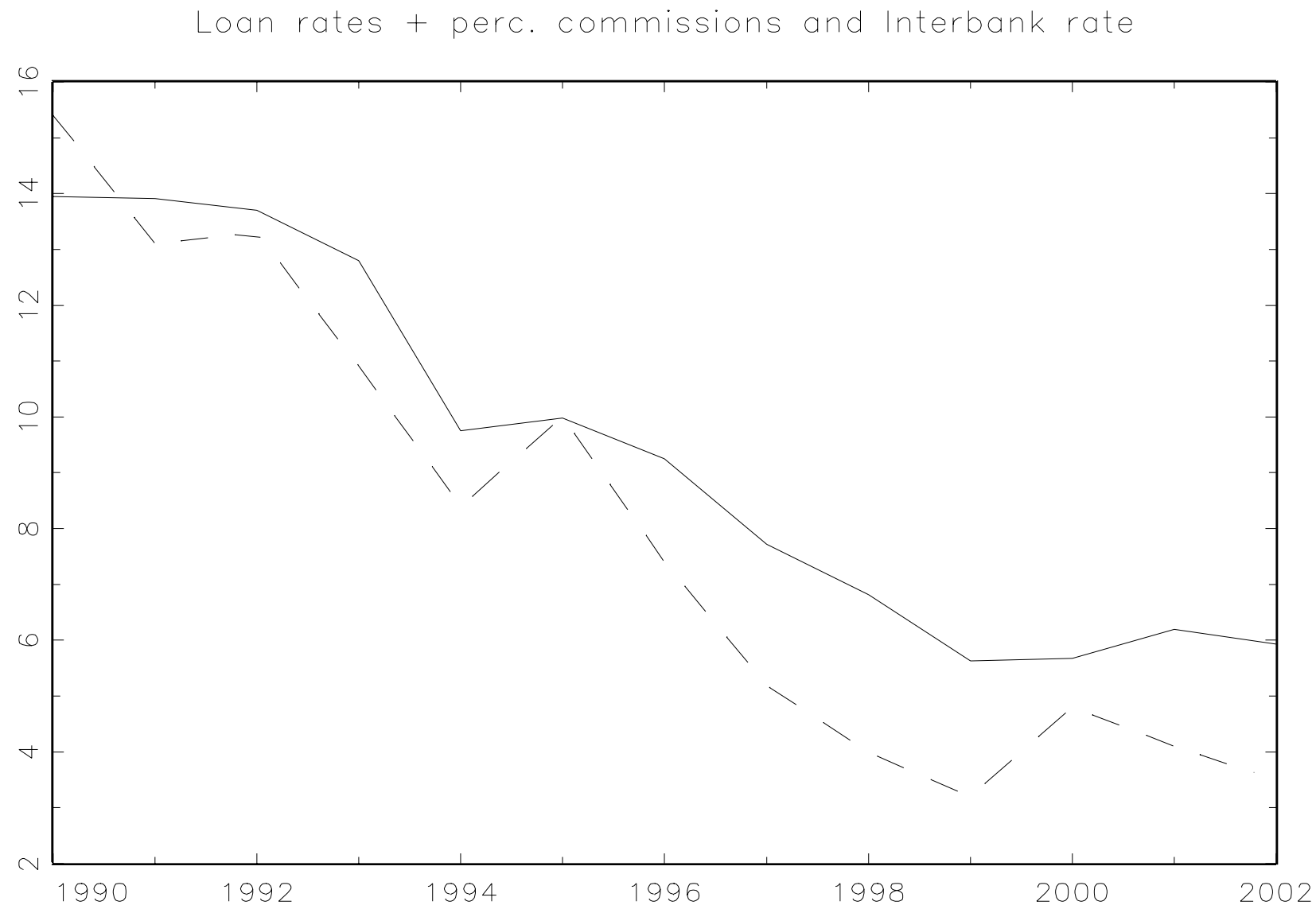

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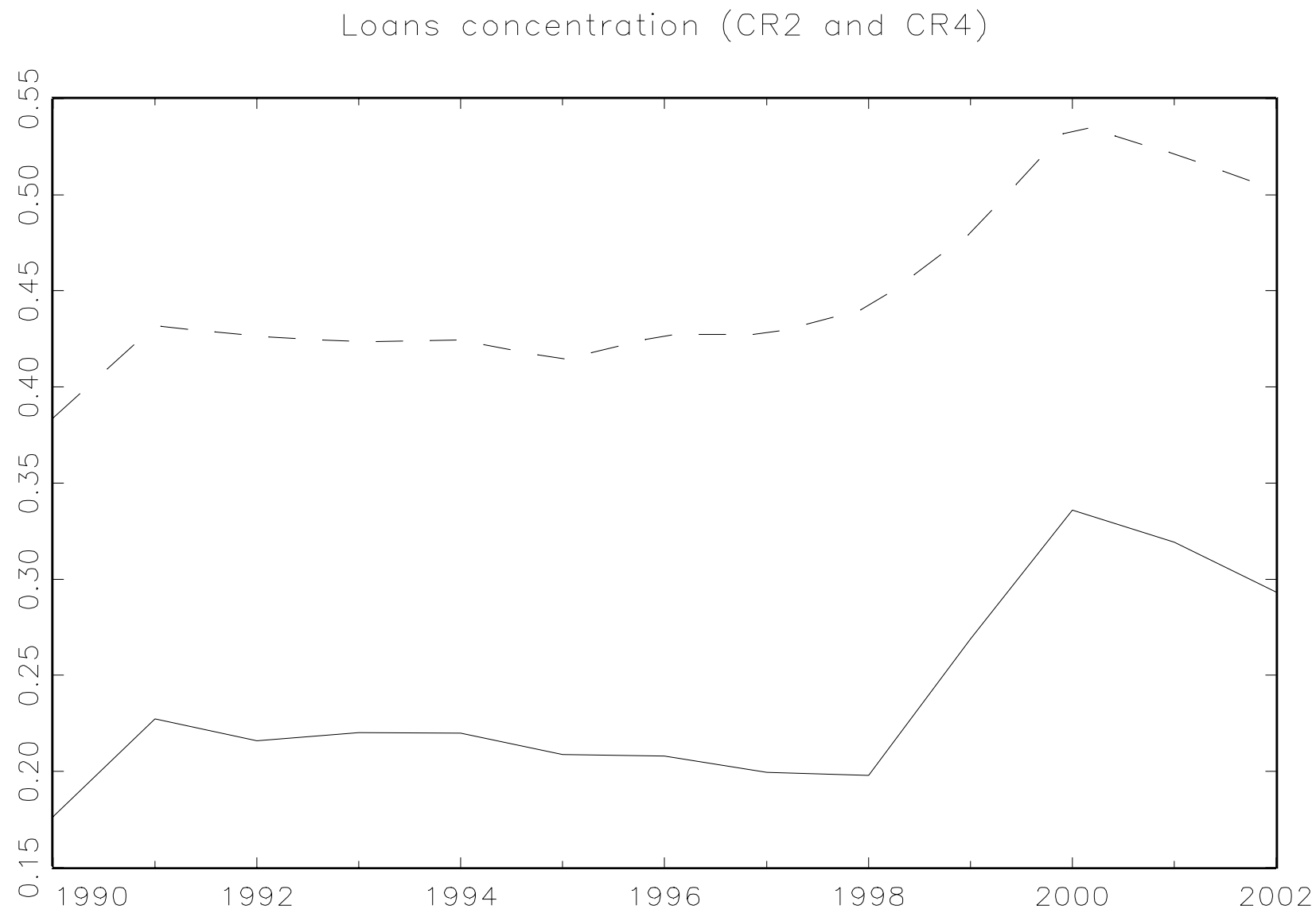

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Figure 4. The evolution of markups

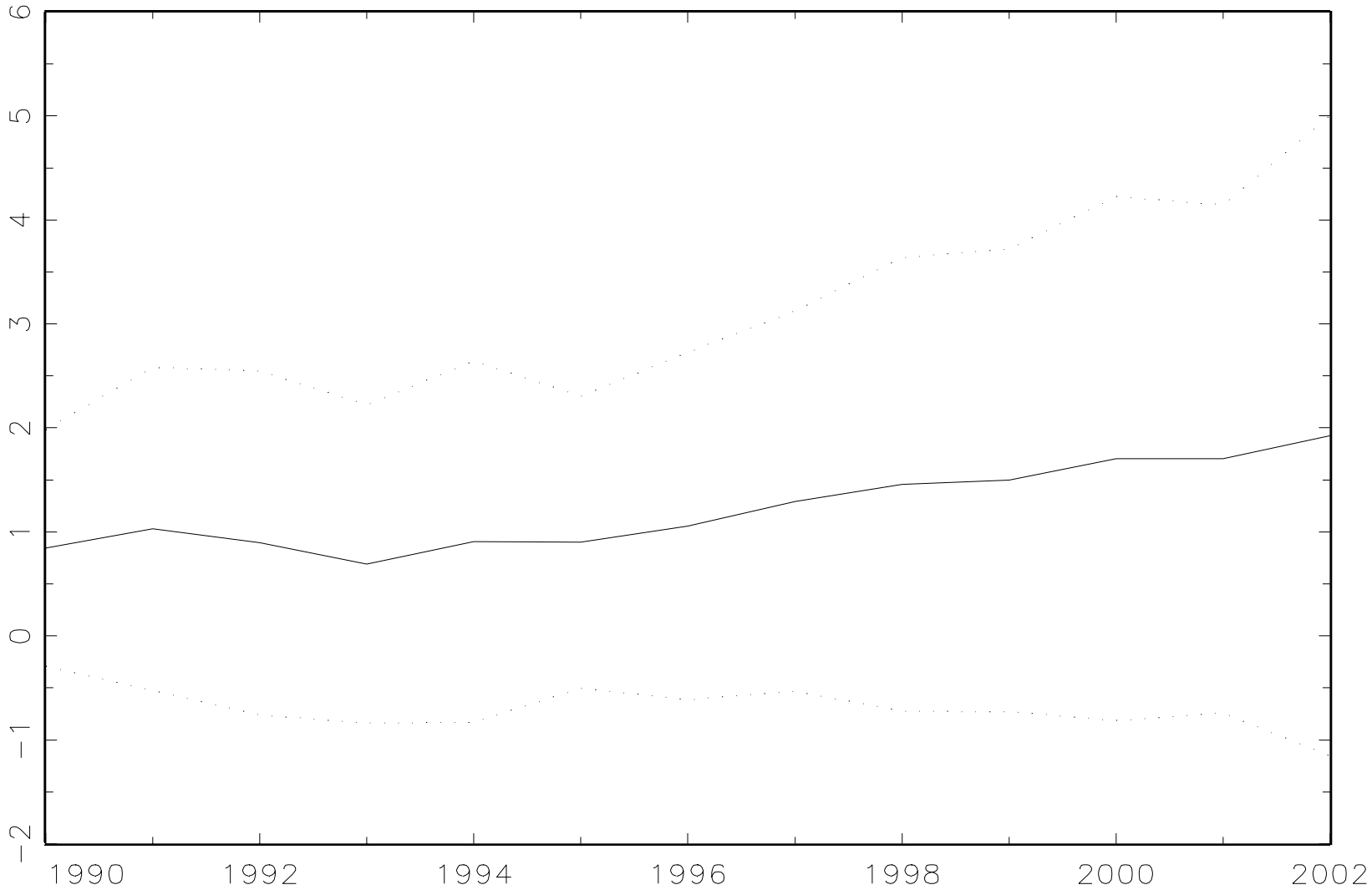

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Figure 5. Post–A/M vs. Pre–A/M markups