BANCA D'ITALIA

Temi di discussione

del Servizio Studi

Why Do Banks Merge?

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Number 361 - December 1999

The purpose of the "Temi di discussione" series is to promote the circulation of working papers prepared within the Bank of Italy or presented in Bank seminars by outside economists with the aim of stimulating comments and suggestions.

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SINTESI

Il contenuto di questo lavoro esprime solamente le opinioni degli autori, pertanto esso non rappresenta la posizione della Banca d'Italia

Il lavoro approfondisce le motivazioni e le conseguenze delle concentrazioni bancarie, analizzando le operazioni realizzate in Italia tra il 1984 e il 1996. In particolare, le motivazioni vengono studiate sulla base delle caratteristiche delle banche prima delle operazioni (analisi ex-ante); le conseguenze vengono invece analizzate sulla base dei mutamenti che le riaggregazioni determinano sui bilanci degli intermediari coinvolti (analisi ex-post).

Rispetto alla letteratura esistente, vengono considerate per la prima volta separatamente da un lato le fusioni e incorporazioni, dall'altro le acquisizioni (le operazioni in cui una banca acquista la maggioranza delle azioni con diritto di voto di un'altra banca).

Le principali conclusioni possono essere così sintetizzate.

In base all'analisi ex-ante, le banche "attive" nelle operazioni di fusione e di incorporazione (ovvero le banche incorporanti) presentano generalmente dimensioni elevate, una alta quota di ricavi da servizi e una posizione creditoria netta sull'interbancario più contenuta rispetto agli altri intermediari. Di converso, le banche incorporate sono poco redditizie, perché caratterizzate da forti costi per il personale e da una bassa capacità di vendere servizi finanziari.

Nelle acquisizioni, l'attività creditizia di tipo tradizionale risulta prevalente sia per le banche attive (le acquirenti), sia per quelle passive (le acquisite). Queste ultime sono però caratterizzate da un rapporto tra le partite in sofferenza e il totale dei crediti superiore al resto del sistema, e pertanto risultano meno redditizie.

I risultati dell'analisi ex-post indicano che dopo le fusioni e le incorporazioni si registra un aumento dei ricavi da servizi, in coerenza con le motivazioni suggerite dall'analisi ex-ante; l'effetto positivo che ne deriva è però vanificato dall'aumento dei costi operativi, in particolare di quelli per il personale. I profitti in rapporto ai fondi intermediati rimangono pertanto immutati. Le operazioni si associano nondimeno a un innalzamento della redditività del capitale, dovuto principalmente a una razionalizzazione nell'utilizzo dei mezzi propri.

Dopo le acquisizioni, le banche oggetto del trasferimento del controllo registrano nel breve periodo un aumento delle sofferenze, presumibilmente in seguito alla revisione delle modalità di selezione e di classificazione dei crediti imposta dai nuovi soci. I vantaggi della nuova gestione divengono visibili successivamente, quando le banche acquisite mostrano una netta riduzione delle sofferenze in rapporto al totale dei crediti; ne consegue un aumento della loro redditività.

Il processo di consolidamento si è esteso negli anni più recenti alle principali banche. Sotto la spinta dell'ulteriore, forte inasprimento della concorrenza, anche internazionale, si fa più incisiva l'azione volta a rimuovere gli ostacoli che in passato hanno limitato la possibilità di ottenere una riduzione dei costi, soprattutto del personale, e a espandere i ricavi derivanti dalla produzione e dalla distribuzione di servizi finanziari. Ne risulta facilitato il conseguimento dei potenziali guadagni di efficienza, dal lato sia dei costi, sia dei ricavi.

WHY DO BANKS MERGE?

by Dario Focarelli[*], Fabio Panetta[*] and Carmelo Salleo[*]

Abstract

The banking industry is consolidating at an accelerating pace, yet no conclusive results have emerged on the benefits of mergers and acquisitions. We analyze the Italian market, which is similar to other main European countries. By considering both acquisitions (i.e. the purchase of the majority of voting shares) and mergers we evidence the motives and results of each type of deal. Mergers seek to improve income from services, but the increase is offset by higher staff costs; return on equity improves because of a decrease in capital. Acquisitions aim to restructure the loan portfolio of the acquired bank; improved lending policies result in higher profits.

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1. Introduction[1]

In the last fifteen years, mergers and acquisitions have reshaped most industries, from mature to innovative sectors, from retailing to telecommunications; in the last five years alone, the fifty largest U.S. firms have been party to more than 4.000 deals, with total value estimated at 1.4 trillion dollars.[2]

The financial industry in particular is consolidating at an accelerating pace: the integration of financial markets has blurred distinctions between such sectors as lending, investment banking, asset management and insurance. Firms have reacted to the sharper competition by cutting costs and expanding in size, often by merging with competitors or taking them over. Long isolated by protective regulations, banks are among the most active players. Technological innovations and a thorough-going deregulation have prompted a wave of mergers in the banking industry throughout the world, starting in the United States in the eighties and reaching Europe in the mid-nineties.

At each announcement of a new deal, its benefits in terms of cost reduction and growth opportunities are emphasized by all parties. Curiously, however, the literature has failed to find convincing empirical evidence of these advantages and thus it questions the usefulness of M&As (for a review of the main results in the field, see Rhoades 1994, and Berger, Demsetz and Strahan, 1998). The lack of significant improvements in banks' performance has led many to rely on explanations based on agency problems.

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[1] An earlier version of this paper was presented at the CEPR conference "The Changing European Financial Landscape", Brussels, 24/26 September 1998; at the VII Tor Vergata Financial Conference "Competition Among Financial Systems and Bank Firm Relationship after Euro", Rome, November 1998; at the Annual Conference of the International Atlantic Economic Society, Vienna, March 1999; at the XXX Chicago Fed Conference on Bank Structure, Chicago, May 1999 and at the 74th WEA Conference in San Diego, July 1999. We would like to thank Allen Berger, John Boyd, Ben Friedman, Mariassunta Giannetti, Luigi Guiso, Marco Pagano, Paolo Marullo Reedtz, Christel Rendu, Enzo Serata, Andrei Shleifer, Bernard Shull, Daniele Terlizzese, Oved Yosha and Luigi Zingales for their suggestions and comments. Roberto Felici provided outstanding research assistance. All remaining errors are our own. The opinions expressed do not necessarily reflect those of the Bank of Italy.

2 Figures collected by Securities Data Company and quoted in the New York Times, February 14, 1999, p. BU 10.

In this paper we deepen the analysis of the efficiency motives for M&As in two directions. First, we consider not only mergers, i.e. deals that involve the full integration of bidder and target banks, but also the transactions in which one bank purchases a controlling stake in another bank without joining the assets of the two (from now on, acquisitions[3]); second, we investigate both the motivations and the consequences of the deals, tracking banks' strategies into their results.

We distinguish between mergers and acquisitions because they may well have different motivations and lead to different results. In particular, mergers, which involve significant organizational problems in integrating two independently run firms, can be expected to differ in goals from acquisitions, which in our definition involve only a transfer of control. This separation enables us to gather useful insights into each type of deal that do not emerge when the data are pooled.

To our knowledge, this is the first paper that compares the motivations for mergers and acquisitions as they appear in an ex ante analysis of the characteristics of the banks with their ex post consequences for their performance. Previous research focuses mainly on the ex post effects, irrespective of the ex ante characteristics of the firms. In principle the consequences should be consistent with the motivations, but in practice a mismatch between strategy and execution is quite possible; such mismatching itself provides information. Furthermore, a better understanding of the determinants of M&As allows us to pinpoint the variables that lead to changes in the main economic and financial indicators usually considered in merger studies. Separating transitory from permanent effects, we test the hypothesis that mergers and acquisitions are followed by improvements in performance, as a result of cost reductions, revenue increases or changes in the financial structure.

The ex ante analysis is conducted through a logit model that allows us to highlight the variables that affect the probability of taking part in a merger or acquisition, either actively as a bidder or acquirer or passively as a target or acquired bank. The strategic aims that emerge from this analysis are checked against their results in an ex post analysis that examines whether the main

3 For a detailed definition of the two types of deals highlighting their differences, see section 4.1.

economic and financial indicators have been affected by M&As. By using a fixed-effects regression we consider a bank before a merger or acquisition as the control for itself after the deal rather than using a control sample selected simply by size and geography. This method allows us to reduce the probability of sample selection biases.

Most of the studies on bank M&As refer to the U.S., using samples that span different time horizons, markets and subsets of banks, dealing mainly with mergers only; few look outside the U.S. and almost none deal with European markets (an exception is Sapienza, 1999), which focuses on the effects of mergers on Italian banks' credit policies, without further investigating the other aspects of their activity). In this paper we analyze all the mergers and acquisitions among Italian banks over the period 1985-1996. This is the first comprehensive exploration of this market, which constitutes a significant share of Italian and European financial markets: almost one third of national financial wealth and one sixth of the euro-area banking industry. Furthermore, the Italian case provides a benchmark for a good number of countries (France, Germany and the continental European countries in general) that share the same characteristics, such as a bank-oriented financial system and rigid labor markets that might impede thorough restructuring.

Our results show that mergers are driven by strategies aimed at selling more services: the active (bidder) bank, which has on average a high level of income from services, is interested in offering its broader range of products to the customers of the passive (target) bank, who are underserved. Acquisitions, by contrast, can be traced back to strategies based on credit management: the aim of the active (acquiring) banks, which have larger loan portfolios than banks that do not take part in any deal, is to improve the quality of the portfolio of the passive (acquired) banks, which also have more loans but with a higher-than-average bad loans ratio.

After a merger, we find no evidence of an improvement in profits, which gibes with the results of most studies of the U.S. market. The reason is that the post-merger increase in revenues from a larger market for services and from the growth of loans relative to total assets is offset by an increase in labor costs. However, we find that mergers are followed by an increase in return on equity, mainly determined by a reduction in capital.

After an acquisition, we detect a long-run increase in profitability for acquired banks. This is due to a permanent decrease in bad loans as a result of a more efficient screening and monitoring; however, it is accompanied by a long-term reduction in lending, especially to small firms. Consistent with previous research (see Berger, Saunders, Scalise and Udell, 1998) both mergers and acquisitions are followed by a reduction of small business lending as a fraction of total loans.

Mergers appear to be geared to changing the financial structure of the bank by decreasing equity and increasing lending (while lowering the share of smaller and presumably riskier borrowers); revenues are diversified towards fees, which are more stable and thus less risky. This objective is achieved, but profitability does not increase because of a rise in costs. Nonetheless, shareholders benefit from an increase in return on equity, thanks to a reduction in capital. Acquisitions are more narrowly focused, aiming to improving the quality of the loan portfolio of the target bank; the desired results are generally attained.

The paper is organized as follows: in section 2 we briefly recall the motives for concentrations; in section 3 we review the empirical literature. In section 4 we describe the data and their sources; in sections 5 and 6 we analyze the determinants of M&A operations. In sections 7 and 8 we assess the consequences of the deals on banks' performance. Section 9 concludes.

2. Main Trends in Mergers and Acquisitions in the Banking Industry

The wave of concentrations among financial institutions can be explained by many factors, all of which result in an increase in competition; the pressure is stronger on banks, which have been sheltered for longer in most countries. In this section we outline the main industry-wide driving forces behind M&As in the last fifteen years, as a backdrop to the action taking place in the market. These changes translate into traditional firm-level strategies based on the search for economies of scale and scope and entry into new markets, which are pursued by means of mergers and acquisitions. In the rest of the paper we concentrate on firm-level decisions and on their results.

A key factor for the consolidation process is deregulation: banks no longer compete only in local or domestic markets but potentially worldwide, with each other and with all the other financial

institutions. In the U.S., for example, the separation between commercial and investment banking has weakened and the Glass-Steagall Act may be repealed; the Riegle-Neal Interstate Banking and Branching Efficiency Act has eliminated geographical limits to expansion, and even the traditional distinction between banking and insurance is questioned (witness the merger between Citibank and Travelers).

In Italy, branching was liberalized in 1990; the Second European Directive on banking and financial services grants the right to banks located in any EU country to operate in all the others; since 1993 Italian banks have been free to hold a limited portfolio of shares and to lend at any maturity (before then they had to be specialized in either short term or medium and long term lending). Since 1996 remote access to the domestic market has been granted to all financial institutions located in any country of the European Union. In fact, deregulation and privatization accompanied a marked increase in the mergers and acquisitions activity.

A second important factor is the revolution in information and telecommunications technology, which contributed to blurring the distinctions between sectors of the financial industry. Banks from different countries and firms from different sectors now compete for the same pool of liquidity and the same demand for services. These changes created a greater role for scale and scope economies in banking.

Deregulation and innovation resulted in a decrease in profitability that bottomed out in the eighties in the U.S. and in the following decade in Europe. Banks have reacted by diversifying sources of income into services and by increasing their size through mergers and acquisitions, in order to survive in markets with narrowing margins[4]; the marginal firms have been liquidated (Mishkin, 1998).

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[4] Some observers argue that larger banks enjoy a free ride because of the "too big to fail" rule, supposedly implemented by authorities (see Boyd and Gertler (1993) and Boyd and Graham (1998)). By providing free insurance to their liabilities, this policy gives large banks a (distorting) competitive advantage, which may be an important reason for ever larger mergers and acquisitions.

In the United States the collapse of the savings and loans institutions and the Latin American debt crisis, which both affected the profitability of the banking industry, spurred a first wave of consolidation in the eighties. The process was refuelled by the deregulation of the early nineties. Mergers and acquisitions, typically, were officially motivated by potential economies of scale, economies of scope (for example with investment banking or brokerage activities) and diversification of assets. In Italy, the plunge in profitability, due to a general economic slump and to the worsening quality of banks' assets in the early nineties, helped accelerate the consolidation process.

More recently, the perspective of European monetary union has acted as a catalyst for some major operations, although the vast majority of M&As have involved domestic banks seeking to defend their territory. The banking industry is still considered strategic at the national level, and entry by foreign banks is not encouraged except for acquisitions of small and medium-sized institutions; furthermore, until the last few years the percentage of banks directly or indirectly state-owned was very high, for historical reasons (as in Italy, where it goes back to the collapse of the banking system in the thirties), political developments (the nationalization program begun in France in the early eighties) or systemic crises (the Scandinavian banking systems in the nineties). Governments often try to maintain or create "national champions" when they privatize the banks they own.

3. Empirical Evidence on M&As

So far, the empirical literature has focused on the performance of banks following a merger. Research has been conducted following two strands. The first approach uses the event study methodology, comparing the market values of bidder and target banks before and after the announcement of the merger: if financial markets are efficient, the stock market reaction should be a good indicator of the economic consequences of the merger. In the second approach, balance-sheet-based indicators or stochastic frontier methodologies are used to compare the performance of the merging banks with that of a control group. The relative merits of the two methods have been discussed elsewhere (Piloff and Santomero, 1998), and we shall not rehearse them here.

The event-test literature reaches the conclusion that bank mergers do not create value: around the announcement of the deal the overall gain from mergers, obtained combining the positive abnormal returns on the shares of the target bank and the negative abnormal returns on the shares of the bidder, is in general small and not significantly different from zero (see for example Houston and Ryngaert, 1994 and the review in Rhoades, 1994).

The operating performance and efficiency of the U.S. banks involved in M&As has been examined in many studies on different samples over different periods, but none offers a convincing explanation for the motivations and the benefits of concentrations. In general, larger, more efficient banks buy smaller, less efficient ones, probably in order to share their better management skills. However, the conclusion reached in almost all cases is that there is no discernible effect on the banks' performance; in particular, there seems to be no decrease in non-interest expenses (Srinivasan, 1992) or total costs (see Berger and Humphrey, 1992 and Rhoades, 1993) and no improvement in operating income (Linder and Crane, 1993).

There seems to be an improvement in profit efficiency defined as the distance from a stochastic profit frontier that in theory identifies the best-practice banks (Akhavein, Berger and Humphrey, 1997); the better performance seems due mainly to a portfolio shift from securities to loans, but there is no evidence of improvement in cost efficiency; furthermore, neither returns on assets nor returns on equity increase. These conclusions are analogous to those of the event studies: both financial markets and economists fail to pin down the advantages of the merging or acquiring banks.

Explanations for such lack of results hinge mainly on agency problems as the main motivation for M&As (for example, Piloff and Santomero (1998) refer to managerial hubris: in this case improved performance is only a casual by-product). A recent line of research analyzes case studies in great detail to separate gains and costs of different parts of the merger process (Frei and Harker, 1996 and Calomiris and Karenski, 1996).

Similar studies conducted outside the U.S. show broadly the same results. In Europe improvements in performance are to be expected only in mergers between banks of the same size (Vennet, 1996). In Italy Resti (1997) finds efficiency gains in mergers between small banks

operating in the same markets, thus confirming that economies of scale are realistic only at a local level and for small sizes.

4. Mergers and Acquisitions in Italy: the Data

In this paper the characteristics of the banks involved in M&As and the effect on their performance are analyzed using balance-sheet data, for two main reasons. First, given the paucity of listed banks, an event study could only be performed for very few large banks. Moreover, our data set allows us to analyze banks' performance over a long time horizon and to investigate the sources of the changes we detect after a merger, i.e. whether the shifts in banks' performance are due to changes in costs or revenues.

In the empirical sections of the paper, we first analyze the variables that influence the probability of being involved in a merger or acquisition using a multinomial logit regression; then we use a fixed-effects regression to verify the effects on the main economic and financial variables (see Pagano, Panetta and Zingales, 1998 for a similar econometric set-up).

4.1 The Sources

We draw our data from three sources. The balance-sheet data come from the Banking Supervision Register at the Bank of Italy (Segnalazioni di Vigilanza) and have been cross-checked with the data published by the Italian Banking Association (ABI) and those available through the Fitch - IBCA BankScope database. All data refer to the end of the year, except for total assets, for which we calculate an annual average of quarterly data. The figures on asset diversification are calculated using data from the Central Credit Register (Centrale dei Rischi), which records all credits above $30,000 from 1984 to 1995 and above $100,000 since 1996. The source of the data on the number of banks and on the mergers and acquisitions is the Census of Banks (SIOTEC).

Given our focus on retail commercial banks, we exclude bank associations' clearing houses, banks specialized in medium and long term lending, the branches of foreign banks and mutual

banks. The first three categories are excluded because their operational peculiarities make them difficult to compare to plain commercial banks: clearing houses operate mainly on the interbank market (as do branches of foreign banks) and have no branch network, like medium-long term banks, which were excluded from short term lending until 1993. Mutual banks are excluded because of the special regulation that sets limits on their operational capacity and because of their different tax treatment.

In the econometric analysis we consider two cases: mergers and acquisitions. A merger occurs when a previously independent bank loses its charter and becomes part of an existing bank, with one headquarters and a unified branch network; studying this case is particularly important in order to understand the effect on banks' performance of changes in the organizational structure.[5]The gains of new ownership are captured by studying acquisitions, which take place when a bank purchases the majority of voting rights of another bank without combining the assets of the two: after the acquisition the two banks are run separately, although they probably coordinate their strategies. For mergers, we only distinguish between an active (bidder) and a passive (target) bank in the logit analysis of the determinants (see below), because after the deal there is just one bank; in the case of acquisitions we analyze the active (acquiring) and the passive (acquired) banks separately both in the ex ante logit analysis and in the ex post regressions.

In the eight cases in which an acquiring/bidder bank is involved in different types of transaction in the same year, we classify it as an acquiring bank; in the three cases in which a bank is both active and passive, we classify it as passive.[6] The inclusion of banks involved in multiple deals avoids sample selection problems that could bias the results against significant effects (for example banks involved in multiple deals might contain relevant information and therefore should not be discarded, as is done in the papers that use the matching sample methodology).

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[5] In the 18 mergers that result in the creation of a new bank (in legal terms a consolidation: see Henn and Alexander (1983)), we consider the larger bank as the bidder and the smaller as the target.

[6] We checked that the results presented in the following sections are not sensitive to these choices.

4.2 The Sample

In 1985, there were 359 commercial banks in Italy; at the end of 1996, 135 mergers and 66 acquisitions later, only 257 were left (including new entries and failures, which are fully accounted for in the summary statistics and the econometric analysis).

Table 1

DISTRIBUTION BY SIZE OF MERGERS AND ACQUISITIONS AMONG ITALIAN BANKS

All deals were concluded between 1985 and 1996. Each bank is assigned to a quintile of the distribution of total assets the year before the deal it is involved in. In the 18 cases of mergers that result in the creation of a new bank (in legal terms a consolidation: see Henn and Alexander 1983), we consider the larger bank as the bidder and the smaller as the target. The first quintile includes the largest banks. In 8 cases a bank whose control had been transferred was later merged and is therefore counted twice.

Active (Bidder or Acquiring) Banks				Passive (Target or Acquired) Banks			
Quintile	Number of Deals	Percentage of Total Deals, in Terms of: Number	Total Assets	Quintile	Number of Deals	Percentage of Total Deals, in Terms of: Number	Total Assets
Mergers							
1° quintile	81	60.0	98.6	1° quintile	16	11.9	70.1
2° quintile	28	20.7	1.2	2° quintile	9	6.7	3.7
3° quintile	16	11.9	0.1	3° quintile	20	14.8	7.9
4° quintile	9	6.7	0.0	4° quintile	38	28.1	12.3
5° quintile	1	0.7	0.0	5° quintile	52	38.5	6.0
Acquisitions of the Majority of Voting Rights							
1° quintile	60	90.9	99.9	1° quintile	10	15.2	49.5
2° quintile	5	7.6	0.1	2° quintile	13	19.7	22.8
3° quintile				3° quintile	18	27.3	19.3
4° quintile	1	1.5	0.0	4° quintile	16	24.2	7.8
5° quintile				5° quintile	9	13.6	0.7

Banks belonging to the top quintile in terms of total assets are active (acquiring/bidder) in 60 per cent of all mergers and 90.9 per cent of all acquisitions (see Table 1). On the other side, targets belong to the bottom quintile in 38.5 per cent of all mergers, while acquired banks are distributed more evenly. Whereas in the United States the acquisition rate (i.e. the ratio of acquired to total number of banks per class size) is almost monotonically increasing in the size of the passive bank (Boyd and Graham, 1998), in Italy the opposite is true, in particular for mergers, fitting the conventional "big fish eating small fish" stereotype.

Summary statistics for our sample are reported in Table 2, distinguishing the banks on the basis of their taking part in each type of deal.[7] Over the 1985-96 period, the median bank of the sample that is not involved in any M&A has total assets of about 930 billion lire (approximately 600 million dollars) and a return on assets of 1.07 per cent (see Panel A); bad loans are 5.65 per cent of total loans and labor costs take 38 per cent of gross income. Lending is equal to 55.09 per cent of deposits and 64.53 per cent of total financial assets; almost two thirds of it goes to small firms. Net interbank credit represents 5.95 per cent of total assets; revenues from services provide 11.76 per cent of gross income.

For mergers, active banks have total assets of 4,310 billion lire (about 3 billion dollars) but the same return on assets as neutral banks at 1.09 per cent, a bad loans ratio of 5.09 per cent and a labor costs-gross income ratio of 37.80 per cent (see Panel B); 53 per cent of total lending (which is equal to 67.03 per cent of total financial assets and 64.59 per cent of deposits) goes to small firms. Net interbank credit is 1.53 per cent of total assets; income from services represents 15.79 per cent of gross income. Passive banks have different characteristics: they are small (400 billion lire in assets), with a return on assets of 0.55 per cent, many bad loans (8.18 per cent of total lending), high labor costs and a low proportion of income from services (respectively 41.55 and 9.68 per cent of gross income - see Panel C); loans cover little more than half of all deposits and

[7] Clear outliers due to errors in data collection were eliminated; for example we deleted bank-years for which equity is greater than total assets.

are mainly extended to small firms (67.43 per cent); net interbank credit is 7.61 per cent of total assets.

Table 2

SUMMARY STATISTICS

The summary statistics of Panel A refer to the banks that were not involved in any operation. Panel B refers to the banks that were active in a merger (bidders), Panel C to the banks that were passive in a merger (targets), Panel D to the banks that acquired the majority of the voting shares of another bank, Panel E to the banks that sold the majority of their voting shares. In the 18 cases of mergers that result in the creation of a new bank (in legal terms a consolidation: see Henn and Alexander 1983), we consider the larger bank as the bidder and the smaller as the target. ROA is defined as income before tax divided by total assets. Total assets are expressed in trillion lire. Bad loans are a percentage of total loans. Labor costs are expressed as a percentage of gross income. The cost of borrowed funds is calculated as the ratio of interest payments to borrowed funds. Services is the value of received fees and commissions as a percentage of gross income. Loans are expressed as a percentage of total financial assets (loans + securities). The net interbank balance is the net creditor (+) or debtor (-) position in the interbank market, in percentage of total assets. Loans to small firms - firms with bank debt below 5 billion lire (approximately 3 million dollars) - are a percentage of total loans.

Variables	Obs.	Median	Mean	Variance	Min.	Max.
Panel A: Banks not Taking Part in any Deal						
ROA	3291	1.07	1.11	0.93	-8.33	14.73
Total Assets	3295	0.93	4.59	198.42	0.02	195.45
Bad Loans	3282	5.65	7.05	30.83	0.00	47.68
Labor Costs	3295	38.00	37.37	145.59	0.00	100.00
Cost of Borrowed Funds	3295	6.65	7.05	3.83	0.00	59.19
Services	3295	11.76	11.66	74.42	0.00	151.43
Loans	3287	64.53	64.06	176.62	15.30	100.00
Net Interbank Balance	3295	5.95	6.77	66.79	-29.04	29.94
Loans/Deposits	3291	55.09	59.10	490.28	13.42	235.85
Loans to Small Firms	3295	63.15	64.29	359.46	5.05	100.00
Panel B: Bidder (Active) Banks in Mergers						
ROA	119	1.09	1.09	0.34	-0.78	2.79
Total Assets	119	4.31	14.22	674.52	0.05	177.02
Bad Loans	119	5.09	5.95	12.99	0.00	26.36
Labor Costs	119	37.80	38.15	76.73	0.00	61.11
Cost of Borrowed Funds	119	6.35	6.75	1.79	4.58	11.35
Services	119	15.79	16.35	70.83	0.00	74.32
Loans	119	67.03	65.40	165.57	22.79	90.67
Net Interbank Balance	119	1.53	1.93	28.81	-15.57	14.01
Loans/Deposits	119	64.59	68.03	398.34	30.04	151.81
Loans to Small Firms	119	53.00	56.04	259.40	19.23	97.14

Table 2 (continued)

Variables	Obs.	Median	Mean	Variance	Min	Max
Panel C: Target (Passive) Banks in Mergers						
ROA	108	0.55	0.37	3.61	-7.72	8.33
Total Assets	109	0.40	2.40	39.73	0.03	43.66
Bad Loans	109	8.18	10.28	67.43	0.00	41.23
Labor Costs	109	41.55	42.52	277.02	0.00	100.00
Cost of Borrowed Funds	109	6.45	6.72	2.21	4.16	12.12
Services	109	9.68	9.34	53.15	0.00	28.57
Loans	109	68.10	67.95	206.80	27.34	97.70
Net Interbank Balance	109	7.61	7.84	62.84	-12.84	29.11
Loans/Deposits	109	56.24	56.43	259.70	22.95	98.23
Loans to Small Firms	109	67.43	67.04	388.58	15.05	100.00
Panel D: Acquiring (Active) Banks						
ROA	42	1.11	1.06	0.33	0.05	2.35
Total Assets	42	16.86	33.67	1474.56	0.55	127.16
Bad Loans	42	4.73	5.14	6.96	1.93	12.34
Labor Costs	42	35.33	38.28	57.16	21.05	53.34
Cost of Borrowed Funds	42	6.05	6.35	1.09	4.82	9.24
Services	42	18.10	19.58	99.38	2.90	69.28
Loans	42	72.57	71.41	75.01	50.66	88.47
Net Interbank Balance	42	-0.28	0.08	13.07	-6.05	10.05
Loans/Deposits	42	87.08	86.96	677.45	42.33	192.12
Loans to Small Firms	42	46.71	48.10	139.18	29.47	85.38
Panel E: Acquired (Passive) Banks						
ROA	59	0.34	-0.09	5.18	-11.03	3.85
Total Assets	59	1.27	3.00	32.34	0.03	31.87
Bad Loans	59	8.46	11.42	57.25	0.00	30.58
Labor Costs	59	43.61	44.75	186.02	0.00	86.67
Cost of Borrowed Funds	59	6.30	6.19	3.48	0.00	15.79
Services	59	14.29	13.65	44.07	0.00	27.09
Loans	58	68.88	70.22	145.17	37.40	100.00
Net Interbank Balance	59	4.63	5.46	37.44	-5.65	22.31
Loans/Deposits	58	63.70	64.81	223.67	40.51	113.14
Loans to Small Firms	59	60.51	61.58	232.86	31.37	100.00

Acquiring banks are similar to bidder banks, except that they are larger (16,860 billion lire), lend less to small firms (46.71 per cent), do more lending with respect to deposits (87.08 per cent), and have a negative net interbank balance (see Panel D). Acquired banks are also similar to target banks, except for a lower return on assets in the year of the takeover, higher labor costs (43.61 per cent of gross income), and higher income from services (14.29 per cent of gross income - see Panel E).

Deals that involve banks in supervised restructuring or liquidation are excluded from our sample. However, given that mergers and acquisitions might be prompted by financial distress of the passive bank, we checked whether the banks involved in bankruptcy procedures are similar to the passive ones in our records. Actually, though, failed banks look quite different from all the banks involved in M&As. They are significantly smaller; the year before filing at the request of the Bank of Italy for supervised restructuring or outright liquidation (the equivalents of Chapter 11 and Chapter 7), the median value of their total assets was approximately equal to 100 million dollars and return on assets was negative (-0.34 per cent on average), while bad loans represented 17 per cent of their portfolio.

5. The Determinants of M&As

This section highlights the characteristics of the banks that take part in M&As, distinguishing between the variables that affect the likelihood of being respectively active or passive in a deal and showing the differences between mergers and acquisitions.

The empirical analysis uses the following methodology. First, we define a discrete variable (ev) which can take 3 values: 1 if the bank is the active party (acquiring or bidder) in an M&A in the year following the observation; 2 if the bank is the passive side (acquired or target) in an M&A

in the following year; and 0 if the bank is not involved in any such operation in the following year.[8] That is, the values of the dependent variable ev are defined as follows for each time t:

ev = 0 for banks not involved in any transaction in year t+1

1 for banks that are active in a merger or acquisition in year t+1

2 for banks that are passive in a merger or acquisition in year t+1

We estimate a multinomial logit regression of the following form:

$$(1) \quad Prob(Ev = i \text{ for } i=0,1,2) = F(a_1 ROA + a_2 SIZE + a_3 BADLOAN + a_4 LABORCOST + a_5 INTPAID + a_6 LOANFIN + a_7 INTERBANK + a_8 SERVICES)$$

where the function F(.) is the logistic distribution. We then use a richer specification, distinguishing between the variables that affect the motivations of the buyer and those that impact on the likelihood of being the seller separately for mergers and acquisitions. We thus define a new discrete variable (*event*) that can take 5 values: for acquisitions, *event* is set to 1 or 2 if the bank is involved in the following year as acquiring or acquired party, respectively; 3 or 4 for a bank that is the bidder or target, respectively, in a merger the following year; 0 if the bank is not involved in any of the above operations in the following year. That is, the values of the dependent variable *event* are defined as follows for each time *t*:

event = 0 for banks not involved in any transaction in year t+1

1 for banks that are active in an acquisition in year t+1

2 for banks that are passive in an acquisition in year t+1

[8] The variable *ev* is defined at time *t* with respect to realizations recorded at time *t+1* because we condition the probability of taking part to a deal on the information available to managers at the time of their decision.

3 for banks that are active in a merger in year t+1

4 for banks that are passive in a merger in year t+1.

In this specification mergers and acquisitions are treated separately because banks might choose one or the other form according to different strategies. In some cases the objectives might require a full merger, which combines the banks' assets and operations, while in other cases it might not be necessary to bear the costs resulting from the integration of all operations; the buyer might simply want to acquire control of the seller and enjoy the gains resulting from its restructuring. We estimate a multinomial logit with the same independent variables as in equation (1) but with a dependent variable that takes values ranging from 0 to 4 (instead of 0 to 2):

$$(2)\ Prob(Event = i \text{ for } i=0,1,2,3,4) = F(a_1 ROA + a_2 SIZE + a_3 BADLOAN + a_4 LABORCOST + a_5 INTPAID + a_6 LOANFIN + a_7 INTERBANK + a_8 SERVICES)$$

The multinomial logit is intended for use when the dependent variable takes on more than two discrete outcomes with no natural ordering; this is the case when the values assigned to the dependent variable are arbitrary. In the case of an acquisition, for example, a bank-year takes the value of 1 if the bank is a buyer and 2 if it is a seller, but this does not imply that the second observation is "greater" than the first. Multiple equations are estimated jointly in order to make efficient use of the information, and the coefficients for each possible outcome are to be interpreted with respect to a reference group, in our case the banks that were not involved in any deal (dependent variable equals 0). The coefficients of equations (1) and (2) are estimated by the maximum likelihood method, pooling all the bank-year observations and including among the

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Furthermore, in case of mergers there is no balance sheet for the passive bank at the end of the year of the deal; therefore, variables must refer to the last available data, i.e. to the year before the transaction.

regressors a time dummy that captures the components that are common to all banks year by year, such as the business cycle, changes in the tax code and technology shifts.

5.1 The Variables

The variables included in the regression capture the possible motivations for a transaction: the buyer might want to purchase and restructure a bank in poor condition (i.e. less profitable, with high costs and a high bad loans ratio) or enter new markets in order to increase fee income. Finally, it might want to diversify its sources of funding and its loan portfolio.

The return on assets (ROA) is a measure of profitability. If the deal is motivated by the desire to exploit inefficiencies by transferring superior managerial skills from buyer to seller, we expect profitability to be correlated positively with the probability of being active (bidder or acquiring bank) and negatively with that of being passive (target or acquired bank). More efficient banks are more likely to be active, while the less efficient ones are more likely to be passive: therefore we expect the coefficient of LABORCOST (the ratio of labor costs to gross income, a standard indicator of efficiency) to be negative for active banks and positive for the passive ones. The riskiness of the loan portfolio can be proxied by the ratio of bad loans to total lending (BADLOAN). A high ratio may reflect a deliberate high risk - high return strategy or simply mismanagement. We therefore expect passive banks to have a higher bad loan ratio, while we have no prior expectation on its value for active banks, given that, if well managed, a high-risk portfolio should also yield high returns.

The active bank might want to raise its fee income by increasing the range of services offered or by reaching more customers. The variable SERVICES (the ratio of income from services to total gross income) is proportional to the importance of fee-based products offered by a bank. In Italy financial services are very profitable and have expanded rapidly in the last few years but still account for a small proportion of total revenues. We therefore expect that banks with expertise in the field (a high value of the variable) will take over banks that do not offer many services in order to market their own products to the latter’s customers.

We include the net interbank balance INTERBANK, defined as the net creditor (positive sign) or debtor (negative sign) position in the interbank market divided by total assets. Banks with a negative or a small positive balance are likely to be more sensitive to the risk of liquidity shocks, which would force them to turn to a relatively expensive source of funding such as the interbank market. We consequently expect them to be more likely to buy banks with a positive balance in order to diversify this risk (a negative coefficient of INTERBANK for active banks). Alternatively, the active bank may reduce its cost of funds (interest on deposits and CDs) by acquiring a passive bank with a low funding cost (INTPAID). Finally, if mergers or acquisitions are motivated by the transfer of managerial skills in handling credit risk, then both the active and the passive bank could have a high value of LOANFIN (lending as a proportion of total financial assets): the former because it has a comparative advantage in managing credit risk, the latter because its loans are the reason it is being targeted. Moreover, we expect that high-LOANFIN banks are likely to be the passive side of a deal, in that this is a proxy for a large number of debtors, who are potential customers for other financial services.

The last variable is SIZE (total assets), since large banks are more likely to be active, and small ones to be passive, if only because their restructuring is more manageable.

6. The Results

The results of the multinomial logit regression are reported in Table 3. The coefficients (with standard errors in parentheses) measure the impact of each variable on the probability of each event with respect to the baseline case (no mergers or acquisitions in the following year): they are to be interpreted as affecting the odds ratio, not the marginal probability.

6.1 Active and Passive Banks

We first run regression (1) where all deals are considered equally, without distinguishing between mergers and acquisitions, but separating active (bidder or acquiring) from passive (target or acquired) banks. This regression shows that lumping all transactions together loses some

information, because, as the following discussion makes clear, mergers and acquisitions have different motivations. We show that some variables that are important for active and passive banks respectively, can be traced back alternatively to mergers or to acquisitions, while other variables that do not seem to affect the probability of being active or passive are relevant alternatively for mergers or acquisitions.

Active banks are larger, more profitable, derive a larger share of income from services and have a smaller net interbank balance; in short, they are healthy and dynamic (see Panel A of Table 3). The negative coefficient on the net interbank balance could be read as a signal that the active bank is exposed to liquidity shocks and wants to diversify. For this purpose, the interbank balance of the passive bank need not be above average: it is sufficient for it to be near average, or for the shocks that hit the two banks to be negatively correlated.

Passive banks are less profitable, smaller, with more bad loans and higher labor costs; they look like an inefficiently run traditional lending business. They also have a higher fraction of assets invested in loans: they might be attractive to potential buyers because, even though they are in need of restructuring, they grant access to a new customer base. Their cost of funding is not significantly lower than average.

The coefficients of the year dummies are significant for both active and passive banks, suggesting that firm-specific factors can not explain alone the wave of concentrations in Italy. The deals are probably also related to economy-wide factors, such as technology shifts, deregulation, tax breaks for banks that incorporate, which helped unfreeze the ownership structure of many. The coefficients of the year dummies become positive and significant the year after the 1993 Banking Law deregulated the industry; this squares with the broad increase in M&A activity after 1993.

DETERMINANTS OF MERGERS AND ACQUISITIONS IN THE ITALIAN BANKING SECTOR

The effect of the variables listed below on the probability that a bank takes part to an M&A transaction is estimated by a multinomial logit model. In the first model (Panel A) the probability is estimated without distinguishing mergers from acquisitions: the dependent variable is 0 if the bank does not take part to a deal, 1 if the bank takes part to a merger as a bidder or acquires the majority of the voting shares of another bank and 2 if the bank takes part to a merger as a target or sells the majority of its voting shares to another bank. In the second model (Panel B) mergers are separated from acquisitions: the dependent variable of the logit is 0 if the bank does not take part to a deal, 1 if the bank acquires another bank, 2 if it is acquired, 3 if it is active in a merger (bidder) and 4 if it is passive in a merger (target). In the 18 cases of mergers that result in the creation of a new bank (in legal terms a consolidation: see Henn and Alexander 1983), we consider the larger bank as the bidder and the smaller as the target. ROA is defined as income before tax divided by total assets. SIZE is the bank's total assets. Bad loans are a percentage of total loans. Labor costs are expressed as a percentage of gross income. The cost of borrowed funds is calculated as the ratio of interest payments to borrowed funds. Services is the value of received fees and commissions as a percentage of gross income. Loans are expressed as a percentage of total financial assets (loans + securities). The net interbank balance is the net creditor (+) or debtor (-) position in the interbank market, in percentage of total assets. The regression also includes a constant and calendar year dummies (not reported). Standard errors are reported in parentheses. The last row reports the value of a Likelihood Ratio test for the hypothesis that the calendar year dummies are all jointly equal to zero. The symbol *** indicates a significance level of 1 per cent or less; ** between 1 and 5 per cent; * between 5 and 10 per cent.

Variable	Panel A: No Distinction Between Mergers and Acquisitions		Panel B: Separating Mergers from Acquisitions			
			Mergers		Acquisitions	
	Active	Passive	Bidder (Active)	Target (Passive)	Acquiring (Active)	Acquired (Passive)
ROA	0.230 **	-0.318 ***	0.153	-0.342 ***	0.563 **	-0.262 **
	(0.113)	*(0.081)*	*(0.132)*	*(0.090)*	*(0.221)*	*(0.116)*
Size	0.020 ***	-0.031 **	0.017 ***	-0.021	0.024 ***	-0.053 **
	(0.003)	*(0.014)*	*(0.004)*	*(0.016)*	*(0.005)*	*(0.026)*
Bad Loans	-0.030	0.032 **	-0.015	0.022	-0.102	0.052 **
	(0.026)	*(0.015)*	*(0.027)*	*(0.016)*	*(0.064)*	*(0.026)*
Labor Costs	-0.015	0.020 ***	-0.013	0.020 **	-0.024	0.027 *
	(0.010)	*(0.007)*	*(0.011)*	*(0.008)*	*(0.024)*	*(0.014)*
Cost of Borrowed Funds	-0.021	-0.094	-0.014	-0.002	-0.087	-0.339 **
	(0.050)	*(0.083)*	*(0.054)*	*(0.081)*	*(0.174)*	*(0.140)*
Services	0.029 ***	-0.020	0.030 ***	-0.046 ***	0.031 **	0.012
	0.007	*0.014*	*(0.008)*	*(0.017)*	*(0.013)*	*(0.015)*
Loans	0.012	0.021 ***	0.005	0.014	0.041 **	0.040 ***
	(0.008)	*(0.007)*	*(0.009)*	*(0.009)*	*(0.017)*	*(0.014)*
Net Interbank Balance	-0.078 ***	0.009	-0.070 ***	0.014	-0.124 ***	-0.019
	(0.013)	*(0.013)*	*(0.014)*	*(0.015)*	*(0.031)*	*(0.022)*
No. of obs:	3597		3597			
R-square:	0.157		0.179			
LR-test	24.58 **	42.23 ***	12.02	19.60 *	245.32 ***	314.28 ***
d.of freedom	$\chi(12)$	$\chi(12)$	$\chi(11)$	$\chi(11)$	$\chi(10)$	$\chi(8)$

6.2 Mergers

The results obtained in the preceding subsection suffer from two drawbacks: some coefficients could be insignificant because they have different signs or levels of significance for mergers and acquisitions, and the significance of the other coefficients could depend exclusively on one of the two types of deal. In this and the following subsection we verify the origin of the degree of significance of the coefficients (see Panel B of Table 3).[9]

Active Banks. In mergers the active banks are larger, have a higher proportion of income generated by services (SERVICES) and a smaller net interbank balance (INTERBANK). The positive and significant coefficient of SERVICES for bidders supports the hypothesis of a broadening of the customer base as a primary motivation: the targets could provide an outlet for the products of the new owner; the negative and statistically significant sign of the coefficient of SERVICES for the target bank is consistent with this explanation. The negative coefficient of INTERBANK for active banks supports a motivation tied to a reduction of the risk of liquidity shocks. The cost reduction can be achieved directly with the merger by matching assets and liabilities of both banks at once. The negative coefficient on INTERBANK for the bidders also suggests a different interpretation, though; banks with a small interbank position may be more dynamic, with better lending opportunities and thus more likely to take part in a merger.

Passive Banks. Targets are less profitable, with higher labor costs: they appear to be good candidates for restructuring. They generate less income from services than the average: this finding was not apparent from the active-passive banks regression (see Panel A of Table 3), where the coefficient on SERVICES was not significant. This squares with the fact that bidders have higher-than-average income from services. It looks as if at least part of the motivation for mergers is reaching the customers of the passive bank to market the services of the active one.

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[9] We checked that the results do not change if we separate mergers and consolidations; consolidations alone are too few (18 observations) to conduct an econometric analysis, while mergers alone yield even stronger results than the ones we report.

The fact that the target is not significantly smaller than average (as would appear from the active-passive bank analysis reported in Panel A of Table 3) could reflect the active bank's hopes of gaining a broad customer base for its services. A large target allows the bidder to reap higher benefits, which in turn might compensate for the costs of combining the two. This interpretation is consistent with the positive coefficient of LOANFIN (borderline significant[10]): the amount of lending relative to total financial assets is a proxy for the number of customers; a high ratio implies that the passive bank has a large customer base.

6.3 Acquisitions

Active Banks. For acquisitions, profitability (ROA) positively affects the probability of being a buyer. The coefficient is statistically significant and entirely drives the significance for the active banks in Panel A of Table 3, as the same coefficient is not significant for mergers. This could be due to the fact that acquisitions are made by healthy banks that want to "export" their managerial skills.

Acquiring banks are larger and have a higher ratio of lending to financial assets, suggesting that their strong point is in lending.[11] It is not surprising that the acquired banks share this characteristic, but with a high bad loans ratio (see below). Acquisitions seem to be driven by the desire to improve the credit capability of the passive bank. Acquiring banks also generate a higher share of income from services. Finally, they have a lower net interbank balance; the same reasoning as for bidders in mergers applies: again, this might simply be evidence that they are dynamic, with better investment opportunities.

Passive Banks. Profitability (ROA) negatively affects the probability of being acquired. This result differs from that of Hadlock, Houston and Ryngaert (1998), who find that ROA is not a

[10] It would be significant at the 10 per cent level if only mergers were considered, dropping the 18 cases of consolidation.

[11] The negative coefficient of BADLOAN squares with this hypothesis, although it is not significant.

significant predictor of acquisition likelihood for US banks[12]; however, their result could reflect the decision to investigate only the determinants of a bank being acquired, ignoring the banks acting as buyers, thus using only part of the information available.

The fact that the acquired bank is smaller can be explained in connection with the positive coefficient of BADLOAN: in fact, acquisitions could be motivated by the prospect of improving the loan portfolio quality under the new ownership (this is consistent with the positive coefficient on LOANFIN: the acquired bank has more lending than average but of poorer quality). In this case, the objective of the buyer would be to increase the value of the stake acquired without incurring the costs related to a merger, a task that can be very costly when the passive bank is large. Finally, the acquired bank has a lower cost of funding (this variable becomes significant only estimating regression (2), as it does not appear to be relevant for mergers - see Panel B of Table 3). This could be related to the low net interbank balance of the acquirer: a likely motivation for the acquisition is thus to lower funding costs, either through cheap deposits or through central cash and liquidity management.

In conclusion, acquisitions appear to be aimed at increasing the value of the passive bank by improving the quality of its loan portfolio, while mergers apparently reflect a strategy of increasing the reach of the active bank's services and changing the composition of assets and liabilities.

6.4 Robustness of the Estimates

In unreported regressions we tried different specifications to test for other motivations for mergers and acquisitions. In particular we examined the impact of the share of lending to small firms as a proxy for diversification of lending by size of debtors: the coefficient is never significant, suggesting that this dimension of diversification is not likely to be a motivation for a merger or acquisition. We also checked the importance of deposits (scaled by total financial assets): the

[12] Their main finding is that management ownership is a powerful explanatory variable for the likelihood of being acquired; the issue is irrelevant in Italy because of the almost total absence of shareholdings by managers.

coefficient is never significant. Apparently, contrary to the general view, deposits are not a major motivation for M&As.

We also included measures of cost and profit efficiency (computed following Berger and Mester, 1997); in particular we estimated a cost and a profit function for all the banks in our sample. We then included among the regressors of the logit analysis the rank of each bank (i.e. its percentile obtained dividing the cost and the profit efficiency distributions into 20 groups, each containing 5 per cent of the banks in the sample).[13] However, the coefficients of these variables were only marginally significant, and did not affect the other coefficients, so we decided to retain a simpler specification that excludes explicit efficiency measures, given that we already have some broad measures of efficiency (such as operating costs over gross income) while still controlling for asset composition.[14]

7. Performance after an M&A Operation

To evaluate the consequences of an M&A operation on banks' performance, we examine the main balance sheet indicators of costs, revenues and profitability. Instead of the traditional matched samples method, which suffers from a number of shortcomings (e.g. the problem of multiple acquirers and the lack of control for dimensions other than the standard size or location), we use a simple two-way fixed-effects panel framework, using each bank before a merger or acquisition as the control for itself after the deal. This allows us to control for all individual bank characteristics, such as for example whether its activity is mainly wholesale or retail. By including a calendar-year fixed effect we control for cyclical patterns common to all banks. Moreover, our specification allows us to separate the short-term and long-term effects, which could be mutually offsetting, thus prompting the unwarranted conclusion that there are no gains to be found (see below).

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[13] Rank is less sensitive to specification and estimation issues than an absolute measure of the degree of efficiency.

[14] The results of these regressions are available from the authors.

For mergers, we compute a pro forma balance sheet by consolidating the balance sheets of the banks involved throughout the period 1984-96, so as to consider them as a single bank from the beginning. We then construct dummy variables that take the value of 1 either in the year of the merger (MERGE0), in the following 3 years (MERGE13) or in all years after the third (MERGEGT3), to pick up the effect of the merger on the newly consolidated institution. For banks involved in acquisitions we created the equivalent dummy variables for both the acquiring (active) bank (ACQA0, ACQA13 and ACQAGT3) and the acquired (passive) bank (ACQP0, ACQP13, and ACQPGT3). The dummy variables that take a value of 1 at t = 0 (i.e. MERGE0, ACQA0 and ACQP0) should measure one-off charges at the moment of the transaction and accounting harmonizations; the dummy variables that take a value of 1 for t = 1, 2, 3 (i.e. MERGE13, ACQA13 and ACQP13) measure the adjustments made during the transition, such as restructuring and temporary tax relief. Finally, those variables that take a value of 1 for t > 3 (i.e. MERGEGT3, ACQAGT3 and ACQPGT3) show the long-term effects of mergers and acquisitions. We then estimate the following fixed-effects regression using each of the balance-sheet ratios reported in tables 4-7 as a dependent variable:

$$
\begin{aligned}
y_{it} = a &+ b_1 MERGE0 + b_2 MERGE13 + b_3 MERGEGT3 \\
&+ b_4 ACQA0 + b_5 ACQA13 + b_6 ACQAGT3 \\
&+ b_7 ACQP0 + b_8 ACQP13 + b_9 ACQPGT3 \\
&+ g_1 SIZE + g_2 SIZESQ + u_i + d_t + e_{it}
\end{aligned}
\qquad (3)
$$

In equation (3) we use SIZE (total assets) and SIZESQ (the square of SIZE) as control variables, since banks of different size have different cost and revenue structures[15]; u_i is an individual dummy and dt is a time dummy; e_{it} is a zero-mean random error. The results are corrected for general heteroskedasticity.

[15] See Generale and Gobbi (1999).

8. The Results

As a general principle, where possible we avoid scaling the dependent variables by total assets: this would create a downward bias on the coefficients because total assets and its square (SIZE and SIZESQ) are also independent variables (the so-called division bias: Deaton, 1988 and Wohlever, 1993)[16].

We choose the dependent variables in order to test whether mergers and acquisitions ultimately improve the performance of the banks involved and to check the consistency of the results with the motivations. The effect on profitability is measured by the return on assets before and after taxes (gross and net ROA), the return on equity before and after taxes (gross and net ROE) and a measure of the bank's efficiency as derived from a variable profits function[17]. Changes in size are captured by total assets, number of employees and number of branches. We measure any improvement in efficiency by labor costs and operating costs over gross income and gross income per capita and by the cost efficiency ranking as derived from a variable costs function (with a methodology analogous to that used for the profit efficiency measure set out above). The ratio of service income to gross income is related to strategies aiming at broadening the customer base. Bad loans and loan losses (as a ratio to total lending) are measures of credit risk, and the net interbank balance over total assets is related to liquidity risk. Both risks are related to the ratio of lending to total financial assets. Finally, small business lending is relevant both for the riskiness of the loan portfolio and as an indicator of banks' lending strategies. In the sections that follow, we discuss the signs of the coefficients that are significant at the 10 per cent level or less.

Tables 4 to 7 give the coefficients, the R-square of each regression and an F-test of the hypothesis that the sum of all coefficients of the post merger or acquisition dummies is equal to zero. We do not report the coefficients of the control variables SIZE and SIZESQ (total assets and total assets squared); they are always highly significant.

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[16] We thank John DiNardo for pointing to our attention the references on the division bias.

8.1 Mergers

8.1.1 Profitability

Short-Run Effects. The return on assets (ROA) before taxes decreases in the year of the merger, probably because of one-off costs for the transaction (see Table 4). Transitory increases in net ROA (positive sign for the coefficient on the dummy for years 1-3) could be due to temporary reductions in the tax burden. Notice that the lack of significance of some coefficients may be due to the downward bias induced by the use of total assets as both independent variable and denominator of the dependent variable.

The return on equity (ROE) increases from the first year after the deal, both before and after taxes. This depends on a decrease in equity, if the two banks had cross-shareholdings or if the merger was financed by cash.[18] In these cases, the ex-post book value of equity is calculated net of previous cross-shareholdings and of the fraction of equity paid for in cash. This reduces the value by comparison with the sum of the book values of combined equity prior to the transaction resulting from the pro forma balance sheets.[19]

However, the decrease in book value of equity can be construed as a more efficient use of capital on the part of banks, so that the impact on profitability goes beyond a mere accounting technicality. If the post-merger bank can perform the same operations as the two banks before the deal but with less equity, this means that excess cash has been returned to shareholders. The same

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[17] As for the *ex ante* analysis, for every bank we take its rank, as measured in 20 groups, each containing 5 per cent of the distribution. If a bank is in the top 5 per cent of the distribution, the rank is 1; if it is in the worst 5 per cent, the rank is 20.

[18] Equity decreases with respect to what it would have been without the merger; in fact there could be an increase in its absolute value, thanks to accrued profits that more than compensate the decrease due to cross-shareholdings or cash payments.

[19] For banks involved in a merger, in 25 cases there is a reduction in the absolute value of equity. In any year the average (median) growth rate of equity is smaller by 11,3 percentage points (2,4 percentage points) than the growth rate of equity recorded for banks not involved in any deal. In a regression analogous to the ones illustrated above, with equity over total assets as the dependent variable, the coefficients of MERGE0, MERGE13 and MERGEGT3 are negative and significant.

result could have been attained by a share buy-back just ahead of the merger or an extraordinary dividend.

Net ROE increases more than gross ROE. The tax rate (taxes over gross earnings) also decreases after the first year and stays lower thereafter, due to several provisions of the tax code that come into play after a merger. The most important is the possibility of carrying forward the losses of the passive bank, which are deductible against the earnings of the new bank for five years. A second reason is that provisioning against future loan losses is deductible up to 0.5 per cent of total lending per year; if the target bank has not used its entire quota and the bidder had provisions in excess of 0.5 per cent, then the new one can increase the deduction without changing total provisions, thus paying less taxes.

Long-Run Effects. There are no significant longer-term changes in ROA, but there is a significant increase in both gross and net ROE (respectively 3.4 and 2.9 percentage points). We take this as evidence that there is no significant increase in profits; rather, the result is driven by the decrease in equity, as noted above. Profit efficiency does not change significantly at any time after a merger (this is confirmed by the F-test on the three coefficients, whose value is too low to reject the null hypothesis that their sum is different from zero), contrary to the result of Akhavein, Berger and Humphrey 1997, who find evidence of changes in profit efficiency but not in ROE or ROA.

8.1.2 Size

The growth rate of total assets decreases in the year of the merger, probably because of the disruptions associated with the transaction (see Table 5); for the years following, the coefficients are not significantly different from 0. The growth rate of the number of branches is never significantly different from 0: this result together with the previous one suggests that the average productivity of branches decreases.

Table 4

EFFECTS OF MERGERS AND ACQUISITIONS ON BANK PROFITABILITY

For each of the variables we estimate the following equation:

$$y_{it} = a + b_1 MERGE0 + b_2 MERGE13 + b_3 MERGEGT3 + b_4 ACQA0 + b_5 ACQA13 + b_6 ACQAGT3 + b_7 ACQP0 + b_8 ACQP13 + b_9 ACQPGT3 + g_1 SIZE + g_2 SIZESQ + u_i + d_t + e_{it}$$

where u_i and d_t are respectively a bank-specific and calendar year-specific effect, SIZE is the bank's total assets and SIZESQ is the square of SIZE. MERGE0, MERGE13 and MERGEGT3 are dummy variables that take a value of 1 respectively in the bank-year of the merger (year 0), in the three following years (years 1 to 3) and in all the years after the third (years>3) and of 0 in all other years. The dummy variables for the acquiring bank (ACQA0, ACQA13 and ACQAGT3) and the acquired bank (ACQP0, ACQP13 and ACQPGT3) follow the same pattern. The table only reports the coefficients on the dummies for each type of deal in the three time intervals (year 0, years 1 to 3 and for the following years). The number of observations is reported for each regression separately and may vary slightly because of data availability. Gross ROA is profits before taxes over total assets, Net ROA is profits after taxes over total assets. Gross ROE is profits before taxes over equity. Net ROE is profits after taxes over equity. Profit efficiency is the rank of each bank in the distribution of the profit efficiency (i.e. its percentile obtained dividing the profit efficiency distribution obtained from a profit function into 20 groups, each including 5 per cent of the banks in the sample: the most efficient banks have a rank of 1). Heteroskedasticity robust standard errors are reported in parentheses. The last column reports the F-test of the hypothesis that the sum of the coefficients of the post merger dummies for each type of deal is equal to zero. The symbol *** indicates a significance level of 1 per cent or less; ** between 1 and 5 per cent; * between 5 and 10 per cent.

Variables	Type of Deal	Year 0	Years 1-3	Years > 3	F-test
Gross ROA (before taxes)	Mergers	-0.096 **	-0.044	-0.014	2.5
No. obs.: 2787		*(0.042)*	*(0.040)*	*(0.061)*	
R-square: 0.541	Acquiring Banks	0.104	0.099 *	-0.067	0.7
		(0.066)	*(0.056)*	*(0.102)*	
	Acquired Banks	-0.487 ***	0.032	0.615 *	0.1
		(0.184)	*(0.161)*	*(0.339)*	
Net ROA (after taxes)	Mergers	-0.009	0.054 *	0.078	2.5
No. obs.: 2785		*(0.029)*	*(0.031)*	*(0.049)*	
R-square: 0.409	Acquiring Banks	0.078	0.097 **	-0.051	1.0
		(0.048)	*(0.041)*	*(0.079)*	
	Acquired Banks	-0.346 **	0.092	0.466	0.2
		(0.164)	*(0.149)*	*(0.346)*	
Gross ROE (before taxes)	Mergers	-0.060	1.547 *	3.431 ***	7.6 ***
No. obs.: 2785		*(0.746)*	*(0.856)*	*(1.101)*	
R-square: 0.491	Acquiring Banks	2.081 *	0.611	-1.876	0.1
		(1.097)	*(1.189)*	*(2.277)*	
	Acquired Banks	-6.378 *	0.165	6.314 *	0.0
		(3.288)	*(1.988)*	*(3.757)*	
Net ROE (after taxes)	Mergers	0.349	2.085 ***	2.895 ***	17.2 ***
No. obs.: 2783		*(0.505)*	*(0.690)*	*(0.843)*	
R-square: 0.380	Acquiring Banks	1.595 **	1.212	-1.124	0.4
		(0.794)	*(0.817)*	*(1.622)*	
	Acquired Banks	-4.294	1.258	5.359 *	0.2
		(2.907)	*(1.571)*	*(3.053)*	
Profit Efficiency	Mergers	0.364	-0.062	-0.468	0.0
No. obs.: 2788		*(0.496)*	*(0.428)*	*(0.537)*	
R-square: 0.131	Acquiring Banks	0.077	0.248	-0.133	0.0
		(0.898)	*(0.703)*	*(1.271)*	
	Acquired Banks	-0.008	-0.940	-1.160	1.3
		(0.700)	*(0.718)*	*(1.355)*	

Table 5

EFFECTS OF MERGERS AND ACQUISITIONS ON BANK SIZE

For each of the variables we estimate the following equation:

$$y_{it} = a + b_1 MERGE0 + b_2 MERGE13 + b_3 MERGEGT3 + b_4 ACQA0 + b_5 ACQA13 + b_6 ACQAGT3 + b_7 ACQP0 + b_8 ACQP13 + b_9 ACQPGT3 + g_1 SIZE + g_2 SIZESQ + u_i + d_t + e_{it}$$

where u_i and d_t are respectively a bank-specific and calendar year-specific effect, SIZE is the bank's total assets and SIZESQ is the square of SIZE. MERGE0, MERGE13 and MERGEGT3 are dummy variables that take a value of 1 respectively in the bank-year of the merger (year 0), in the three following years (years 1 to 3) and in all the years after the third (years>3). The dummy variables for the acquiring bank (ACQA0, ACQA13 and ACQAGT3) and the acquired bank (ACQP0, ACQP13 and ACQPGT3) follow the same pattern. The table only reports the coefficients on the dummies for each type of deal in the three time intervals (year 0, years 1 to 3 and for the following years). The number of observations is reported for each regression separately and may vary slightly because of data availability. Number of branches is the number of branches operational at year-end. Number of employees includes the workforce employed in information technology functions. Heteroskedasticity robust standard errors are reported in parentheses. The last column reports the F-test of the hypothesis that the sum of the coefficients of the post merger dummies for each type of deal are equal to zero. The symbol *** indicates a significance level of 1 per cent or less; ** between 1 and 5 per cent; * between 5 and 10 per cent.

Variables	Type of Deal	Year 0	Years 1-3	Years > 3	F-test
Size (growth rate)	Mergers	-2.870 ***	-0.316	-1.628	5.6 **
No. obs.: 2559		*(1.069)*	*(0.747)*	*(1.068)*	
R-square: 0.214	Acquiring Banks	0.667	-1.361	-0.966	0.2
		(1.461)	*(1.187)*	*(1.862)*	
	Acquired Banks	1.704	1.323	-1.879	0.1
		(1.656)	*(1.602)*	*(2.795)*	
Number of Branches	Mergers	0.719	-0.390	-0.176	0.0
(growth rate)		*(0.713)*	*(0.551)*	*(0.870)*	
No. obs.: 2562	Acquiring Banks	1.431	-0.681	-0.663	0.0
R-square: 0.198		*(1.680)*	*(1.004)*	*(1.639)*	
	Acquired Banks	-1.003	1.317	-0.289	0.0
		(2.289)	*(2.239)*	*(1.730)*	
Number of Employees	Mergers	-0.524	-0.545	-0.082	1.1
(growth rate)		*(0.638)*	*(0.412)*	*(0.707)*	
No. obs.: 2549	Acquiring Banks	1.777	-0.242	-1.343	0.0
R-square: 0.204		*(1.735)*	*(0.732)*	*(1.033)*	
	Acquired Banks	-3.922 ***	-1.101	1.554	1.6
		(1.148)	*(1.001)*	*(1.739)*	

8.1.3 Efficiency and Productivity Gains

After a merger, labor costs and operating costs rise against gross income from the very first year and stay permanently higher by 1.7 and 1.5 per cent (see Table 6). This could be due to the fact that banks usually upgrade the salaries of the employees of the passive bank if they are lower than the active bank's[20] but rarely downgrade them if they are higher; therefore labor cost per employee can only increase. At the same time labor regulations in Italy make it extremely difficult to reduce the workforce; in fact, in an unreported regression on the levels of employment we verify that the number of employees relative to total assets becomes permanently higher than average. This regulation-induced rigidity means that mergers motivated by cost-cutting are not likely. Furthermore, gross income per employee also decreases (the sum of the three coefficients is significantly different from zero, and so are the coefficients for year 0 and for all years after the third): this suggests that possible economies of scale are not exploited. Finally, cost efficiency also worsens from the first year.

8.1.4 Diversification of Revenues and of Funding

The increase in the share of fee income that starts three years after the deal (2.5 per cent: see Table 7) supports the hypothesis that mergers are motivated by the aim of broadening the customer base for the services of the active bank; the positive effects emerge fully after a few years, probably because it takes time to train the personnel of the target bank, advertise for its customers, and so on. The higher share of service revenues decreases total riskiness because of its greater stability; this contributes to explaining why the reduction in capital seems acceptable for a bank.

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[20] For mergers, in 4 cases out of 5 labor cost per employee is higher for the bidder; its median value is 8.5 per cent higher for the bidder than for the target.

Table 6

EFFECTS OF MERGERS AND ACQUISITIONS ON BANK COST EFFICIENCY AND PRODUCTIVITY

For each of the variables we estimate the following equation:

$$y_{it} = a + b_1 MERGE0 + b_2 MERGE13 + b_3 MERGEGT3 + b_4 ACQA0 + b_5 ACQA13 + b_6 ACQAGT3 + b_7 ACQP0 + b_8 ACQP13 + b_9 ACQPGT3 + g_1 SIZE + g_2 SIZESQ + u_i + d_t + e_{it}$$

where u_i and d_t are respectively a bank-specific and calendar year-specific effect, SIZE is the bank's total assets and SIZESQ is the square of SIZE. MERGE0, MERGE13 and MERGEGT3 are dummy variables that take a value of 1 respectively in the bank-year of the merger (year 0), in the three following years (years 1 to 3) and in all the years after the third (years>3). The dummy variables for the acquiring bank (ACQA0, ACQA13 and ACQAGT3) and the acquired bank (ACQP0, ACQP13 and ACQPGT3) follow the same pattern. The table only reports the coefficients on the dummies for each type of deal in the three time intervals (year 0, years 1 to 3 and for the following years). The number of observations is reported for each regression separately and may vary slightly because of data availability. Operating costs are expressed as a fraction of gross income. Labor costs are expressed as a fraction of gross income. Gross income per employee is expressed in million lire. Cost efficiency is the rank of each bank in the distribution of the cost efficiency measure (i.e. its percentile obtained dividing the cost efficiency distribution obtained from a cost function into 20 groups, each including 5 per cent of the banks in the sample: the most efficient banks have a rank of 1). Heteroskedasticity robust standard errors are reported in parentheses. The last column reports the F-test of the hypothesis that the sum of the coefficients of the post merger dummies for each type of deal are equal to zero. The symbol *** indicates a significance level of 1 per cent or less, ** between 1 and 5 per cent; * between 5 and 10 per cent.

Variables		Type of Deal	Year 0	Years 1-3	Years > 3	F-test
Operating Costs		Mergers	1.628 ***	1.267 **	1.453 **	14.3 ***
No. obs.:	2788		*(0.527)*	*(0.526)*	*(0.685)*	
R-square:	0.635	Acquiring banks	-1.253	-1.344	1.260	0.4
			(0.860)	*(0.860)*	*(1.628)*	
		Acquired banks	4.233 *	-0.386	-3.804	0.0
			(2.485)	*(2.196)*	*(5.439)*	
Labor Costs		Mergers	1.236 ***	0.966 ***	1.677 ***	21.7 ***
No. obs.;	2788		*(0.410)*	*(0.366)*	*(0.503)*	
R-square:	0.691	Acquiring Banks	-1.306 *	-1.026 *	1.489	0.3
			(0.682)	*(0.622)*	*(1.153)*	
		Acquired Banks	1.958	-1.608	-2.087	0.3
			(1.447)	*(1.141)*	*(3.087)*	
Gross Income per Employee		Mergers	-0.004 **	-0.001	-0.005 *	5.6 **
No. obs.:	2780		*(0.002)*	*(0.002)*	*(0.003)*	
R-square:	0.839	Acquiring Banks	0.004	0.006 *	0.001	1.3
			(0.004)	*(0.004)*	*(0.007)*	
		Acquired Banks	-0.014 *	-0.005	-0.001	2.3
			(0.007)	*(0.004)*	*(0.010)*	
Cost Efficiency		Mergers	0.732 *	0.065	0.820 **	5.3 **
No. obs.:	2788		*(0.396)*	*(0.324)*	*(0.394)*	
R-square:	0.487	Acquiring Banks	0.753	-0.678	-1.663 **	1.9
			(0.558)	*(0.466)*	*(0.689)*	
		Acquired Banks	-0.656	-0.670	-0.694	1.4
			(0.606)	*(0.592)*	*(1.412)*	

In the short run there is no improvement in the net interbank balance, although it might have been part of the motivations for the transaction (see section 6). This is to be expected: given that we reconstruct the pro forma balance sheet backwards, if the goal had been to compensate two interbank positions immediately, there would no discernible effect as the sum of the two balances would obviously not change.

Why does then the net interbank balance improve by 0.88 per cent of total assets in the long run (notice that this is apparent only by dividing the period after the deal into three intervals)? This could be a response to the general change in the composition of assets and liabilities that follows the merger. We find a long-run increase in the ratio of lending to total financial assets of 3 per cent; this could require a larger buffer of liquidity, obtained as a higher net interbank balance. The active bank started with a small interbank balance and an average lending-to-total financial assets ratio and, as a result of the deal, ends in the long run as a bank with more lending and a higher interbank balance: the intermediation profile has changed significantly.

There are no significant changes in bad loans and loan losses. However, the long-run decrease of loans to small firms (-1.8 per cent) confirms that there is a significant change in lending strategies and is consistent with the literature on small business lending (Berger, Saunders, Scalise and Udell 1998 and Sapienza 1999[21]), which finds that large banks (possibly resulting from M&As) lend to large firms. It seems that mergers have a negative direct effect on small business lending; however, in order to assess the overall impact we would need to know whether other banks take up the slack.

[21] Sapienza (1999) finds a similar result for in-market transactions, that increase the market power of the bank; out-of-market deals don't seem to affect small business lending.

8.2 Acquisitions

8.2.1 Profitability

Short-Run Effects. Acquired banks experience a drop in (net and gross) ROA in the year of the transaction (see Table 4), probably as a result of an increase in loan losses (see below), in connection with a general reassessment of the loan portfolio. Acquiring banks increase net and gross ROA (but not ROE) in the three years after the transaction, but it is hard to see this as a result of the acquisition; it could be that it is the acquisition that is timed to coincide with a forecast of higher earnings.

Long-Run Effects. In the long run there is an increase in profitability for the acquired bank (positive significant coefficient for gross ROA, gross and net ROE, which increases by more than 5 per cent). We detect this by splitting the post-acquisition period into our three sub-periods: the F-test on the sum of coefficients is too low to reject the null hypothesis that there are no changes after an acquisition. For acquiring banks there are no long-term effects; the value of the stake in the acquired bank is probably worth more due to its increased profitability, but shareholdings held with no trading purposes are in general booked at cost and therefore their value does not vary with time.

8.2.2 Size

The coefficients on growth rates for total assets and branches are never significantly different from 0 (see Table 5): the growth path of acquiring and acquired banks is not affected by the transaction.

Table 7

EFFECTS OF MERGERS AND ACQUISITIONS ON BANK REVENUES AND DIVERSIFICATION

For each of the variables we estimate the following equation:

$$y_{it} = a + b_1 MERGE0 + b_2 MERGE13 + b_3 MERGEGT3 + b_4 ACQA0 + b_5 ACQA13 + b_6 ACQAGT3 + b_7 ACQP0 + b_8 ACQP13 + b_9 ACQPGT3 + g_1 SIZE + g_2 SIZESQ + u_i + d_t + e_{it}$$

where u_i and d_t are respectively a bank-specific and calendar year-specific effect, SIZE is the bank's total assets and SIZESQ is the square of SIZE. MERGE0, MERGE13 and MERGEGT3 are dummy variables that take a value of 1 respectively in the bank-year of the merger (year 0), in the three following years (years 1 to 3) and in all the years after the third (years>3). The dummy variables for the acquiring bank (ACQA0, ACQA13 and ACQAGT3) and the acquired bank (ACQP0, ACQP13 and ACQPGT3) follow the same pattern. The table only reports the coefficients on the dummies for each type of deal in the three time intervals (year 0, years 1 to 3 and for the following years). The number of observations is reported for each regression separately and may vary slightly because of data availability. Fees from services are expressed as a fraction of gross income. Loans are expressed as a fraction of total financial assets (loans + securities). Loans to small firms are the fraction of total loans extended to firms with total bank debt < 5 trillion lire (3 million US dollars). Bad loans are expressed as a fraction of total loans. Loan losses are expressed as a fraction of total loans. The net interbank balance is the net creditor (+) or debtor (-) position in the interbank market, in percentage of total assets. Heteroskedasticity robust standard errors are reported in parentheses. The last column reports the F-test of the hypothesis that the sum of the coefficients of the post merger dummies for each type of deal are equal to zero. The symbol *** indicates a significance level of 1 per cent or less; ** between 1 and 5 per cent; * between 5 and 10 per cent.

Variables		Type of Deal	Year 0	Years 1-3	Years > 3	F-test
Fees from Services		Mergers	1.045 *	0.073	2.488 **	8.3 ***
No. obs.:	2788		*(0.559)*	*(0.589)*	*(1.042)*	
R-square:	0.643	Acquiring Banks	-0.069	-0.758	1.222	0.0
			(0.767)	*(0.778)*	*(1.383)*	
		Acquired Banks	-0.407	-0.313	0.509	0.0
			(0.792)	*(0.641)*	*(1.059)*	
Loans		Mergers	0.049	1.672 ***	2.978 ***	13.0 ***
No. obs.;	2779		*(0.670)*	*(0.576)*	*(0.742)*	
R-square:	0.703	Acquiring Banks	0.338	-0.640	-2.476	1.4
			(0.932)	*(0.939)*	*(1.560)*	
		Acquired Banks	-1.967	-4.150 ***	-5.482 **	12.9 ***
			(1.244)	*(1.393)*	*(2.149)*	

Table 7 continued

Variables		Type of Deal	Year 0	Years 1-3	Years > 3	F-test
Loans to Small Firms		Mergers	0.077	-1.231 **	-1.770 **	6.1 **
No. obs.:	2788		*(0.598)*	*(0.476)*	*(0.723)*	
R-square:	0.871	Acquiring Banks	-1.848 **	0.432	2.077	0.1
			(0.926)	*(0.752)*	*(1.379)*	
		Acquired Banks	-0.926	-0.993	-6.535 ***	8.6 ***
			(1.261)	*(1.003)*	*(2.054)*	
Bad Loans		Mergers	-0.240	-0.077	-0.106	0.6
No. obs.:	2776		*(0.254)*	*(0.249)*	*(0.388)*	
R-square:	0.547	Acquiring Banks	-0.831 **	-0.752 **	0.660	0.7
			(0.345)	*(0.353)*	*(0.833)*	
		Acquired Banks	3.317 ***	1.877 *	-3.895 **	0.3
			(1.014)	*(0.999)*	*(1.617)*	
Loan Losses		Mergers	-0.015	0.049	-0.031	0.0
No. obs.:	2718		*(0.084)*	*(0.096)*	*(0.140)*	
R-square:	0.250	Acquiring Banks	-0.294 ***	0.101	0.304	0.1
			(0.096)	*(0.129)*	*(0.198)*	
		Acquired Banks	0.752 **	0.534	-1.103	0.1
			(0.344)	*(0.545)*	*(0.705)*	
Net Interbank Balance		Mergers	-0.174	-0.438	0.875 *	0.1
No. obs.:	2788		*(0.379)*	*(0.327)*	*(0.496)*	
R-square:	0.697	Acquiring Banks	-1.244 **	-2.009 ***	-3.451 ***	35.1 ***
			(0.604)	*(0.525)*	*(0.650)*	
		Acquired Banks	2.953 ***	-0.754	-0.608	0.7
			(0.773)	*(0.748)*	*(1.364)*	

8.2.3 Efficiency and Productivity Gains

Short-Run Effects. For acquiring banks there is a decrease in labor costs for the first three years after the transaction but no changes in the long run (but there is a gain in cost efficiency); there is also a slight increase in gross income per employee for the first three years (see Table 6).

For acquired banks, operating costs rise as a share of gross income in the year of the deal. This suggests that there is some one-off administrative cost for acquisitions: as there are no changes in labor costs, the increase in operating costs is entirely due to overhead spending.

Long-Run Effects. The acquisition has no permanent effect on the cost structures of the acquired banks. There is no evidence of successful cost restructuring; this is consistent with the hypothesis that the goal was the restructuring of the passive bank's loan portfolio.

8.2.4 Diversification of Revenues and of Funding

Bad loans decrease for acquiring banks until the third year after the transaction and then increase (but the coefficient is not significant - see Table 7). Again, this could be due to its managers anticipating an exogenous or endogenous decline in riskiness of the loan portfolio and therefore planning an acquisition. The decrease in loan losses in the year of the acquisition could reflect some window dressing: the acquiring bank is made to look good in the year of the expansion.

For the acquired banks, the F-test on the sum of the coefficients of bad loans does not allow us to reject the null hypothesis (total effect equal to zero), but this hides a pattern that is significant for each of the three sub-periods and that is consistent with the motivations for acquisitions suggested by our ex ante analysis. In the short-run the bad loans ratio increases by 3.3 per cent in year t = 0 and by 1.9 per cent in the following three years. Subsequently, the quality of the loan portfolio increases permanently because of the improvement in credit risk management brought by the active bank (a long-run decrease of the bad loans ratio of 3.9 per cent). In fact, the acquiring bank gains the power to name the Chief Financial Officer, who sets lending standards and coordinates lending policies with the other banks of the group. The improvement is perceptible only after the third year because in the interim it is more than offset by an increase in bad loans presumably caused by the introduction of the acquirer's stricter standards for the classification of loans. The temporary surge in bad loans and loan losses followed by a permanent decrease in bad loans after the third year squares with the patterns observed in profitability for the acquired bank.

For the acquired bank the re-assessment of the loan portfolio and the more conservative lending strategy of the new owner result in a long-run decrease in the ratio of lending to total financial assets that starts the year after the deal (the coefficient of this variable is negative and significant: -4.1 per cent for the first three years after the deal, then -5.5 per cent). Similarly, there is a long-run decrease in small business lending (-6.5 per cent), which seems to be motivated by risk concerns as well as by the traditional argument that large banks lend to large firms. Acquisitions are not strictly speaking equal to mergers, but lending policies are nonetheless coordinated at the bank holding level.

There is no evidence of cross-selling between acquiring and acquired banks, as fee income does not change significantly; this is probably due to organizational rigidities that make it difficult to coordinate product lines between separately chartered banks, or maybe it simply was not part of the acquisition strategy.

The net interbank balance improves for acquired banks the year of the transaction and worsens permanently for acquiring banks: this is puzzling, as it is not accompanied by any other significant change in the composition of assets and liabilities.

9. Conclusions

In this paper we investigate the determinants and the consequences of bank mergers and acquisitions in Italy. Acquisitions are observed in depth for the first time; we shed light on their motivations and subsequent performance by comparing them with mergers. Examining the two types of deal separately, we note that expanding revenues from financial services is a strategic objective for mergers, whereas improving the quality of the loan portfolio of the passive bank is central for acquisitions. We follow the same approach in treating the consequences of M&As, seeking to correlate results with the types of deals and checking the consistency of the strategies.

Following the indications of our ex ante analysis of what matters for mergers and acquisitions, we examine the banks' ex post performance in terms of revenue, cost and asset structure. By separating the short-run from the long-run effects we uncover patterns and find significant changes

in variables that would otherwise be overlooked. We can thus explain what drives M&As, introducing the notion that mergers and acquisitions of the majority of voting rights correspond to different motivations and produce different results. For the first time we shed some light on a major European market.

The consequences of mergers differ substantially from those of acquisitions, as one should expect in view of the evidence on their different motivations. In mergers, the objective of selling more services requires taking over the target bank and fully integrating its marketing network with that of the bidder. Without a complete integration, the branch managers of the passive bank would be likely to lack the enthusiasm needed to market the new owners' products. In the case of acquisitions, where the objective of improving the passive bank's loan portfolio is crucial, the purchase of a controlling stake is sufficient to transfer superior lending competence from the active to the passive bank, thus avoiding the high costs that usually accompany full integration.

More efficient use of capital and a reduction in the tax burden allows banks taking part in mergers to increase their return on equity; the increase in revenues from services tends to be offset by higher labor costs. The total effect on risk is hard to assess: less equity is remunerated by the same amount of profits; profits in turn are more stable because of the increase in fee income, but they must cover more loans (increase in exposure) that are on average less risky (less small business lending).

For acquisitions, the increase in profitability for the acquired banks is linked to the improvement in the quality of their loan portfolio; other functions and the general operating structure are not affected by the transfer of control. In particular, the cost of labor, which was above average before the deal, does not decrease.

Strategies based on economies of scale or cutting costs (in particular labor costs) are difficult to implement under Italian labor laws and probably not easy in continental Europe in general. The lack of evidence in favor of thorough-going restructuring could also depend on the constraints imposed by the corporate governance of Italian banks, which especially in the past used to give bargaining power to local stakeholders and trade unions.

Our findings on mergers are compatible with the empirical evidence on the U.S., at least as regards changes in the financial structure of banks and the absence of cost cutting. We find a certain degree of consistency between the objectives and results of M&As: acquired banks have problems with their loan portfolio that are subsequently resolved, while mergers are geared to an expansion of services, which is achieved. For mergers, it remains to be explained why increasing profits does not seem to be a top priority.

Our results suggest that mergers and acquisitions should be examined separately, as they are driven by different factors. If M&As are judged not only on an absolute basis but by comparing the outcome to the motivations, explanations that rely mainly on agency motives, such as managerial hubris (Roll, 1986), must be set aside until further research reaches conclusive evidence on the efficiency-improving consequences of bank mergers and acquisitions.

Appendix

A.1. Definitions of Variables

Income from services, or fee income: commissions and fees from services (investment banking and mutual funds fees, etc.), excluding capital gains.

Gross income: net interest income plus income from services.

Labor costs: gross salary plus social security contributions.

Operating costs: labor costs plus other non-interest costs (administrative, depreciation, other costs).

Bad loans: loans to firms in liquidation or other bankruptcy proceedings plus loans to firms having defaulted on repayment installments for at least six months.

Loan losses: the sum of the value of the loss for each loan.

Small business loans: loans to firms with less than 5 billion lire worth of total bank debt.

Deposits: accounts held for saving and transaction purposes.

Borrowed funds: deposits plus CDs.

Total financial assets: cash plus bonds plus shares plus outstanding lending.

Gross ROA: earnings before taxes / total assets.

Net ROA: earnings after taxes / total assets.

Gross ROE: earnings before taxes / book value of equity.

Net ROE: earnings after taxes / book value of equity.

Total assets: expressed in billions of lire; average of quarterly values.

Branches: included if they are operational at the end of the year.

Employees: all workers and managers with a salary-based contract, including those employed in information technology.

Cost of borrowed funds: the ratio of total interest payments to borrowed funds.

Net interbank balance: the net creditor (+) or debtor (-) position on the interbank market.

We eliminate all observations that are clear outliers, most probably due to errors in the collection of data: equity larger than total assets, return on assets above 20 per cent, negative values for stock variables.

A.2. Estimates of Profit and Cost Efficiency

A.2.1. Profit Efficiency

Profit efficiency is measured by first estimating a variable profits function (see Berger and Mester 1998), using the following variables:

- dependent variable: variable profits (Π): revenues less interest and operating costs – we add the absolute value of the minimum value of the sample to all observations in order to have only positive values;
- independent variables: variable input prices, variable output quantities, fixed netput quantities, geographic dummy variables.

In particular, the inputs and outputs are the following:

- variable input prices w_i: interest rate on deposits, interest rate on other liabilities, labor cost per capita;

- variable output quantities y_k: total lending, other financial assets, income from services;
- fixed netput quantities z_r: physical capital (net value of property owned), book value of equity;
- dummy variables that partition the sample into 4 groups $GEOGDUM_i$: banks incorporated in the North-West, North-East, Center and South-Islands.

The variable profits function considers the quantities of output (as in a cost function) instead of their prices; as a consequence, it suffers less than a standard profit function from distortions induced by problems in gauging the quality of output and measuring its prices, and by the lack of perfect competition.

The following variable profits function is estimated for every year in the sample with standard OLS methodology:

$$\ln\left(\frac{p}{w_3 z_3}\right) = a + \Sigma b_i \ln\left(\frac{w_i}{w_3}\right) + \frac{1}{2}\Sigma\Sigma b_{ij} \ln\left(\frac{w_i}{w_3}\right)\ln\left(\frac{w_j}{w_3}\right) + \Sigma g_k \ln\left(\frac{y_k}{z_2}\right) + \frac{1}{2}\Sigma g_{km} \ln\left(\frac{y_k}{z_2}\right)\ln\left(\frac{y_m}{z_2}\right)$$
$$+ \Sigma d_r \ln\left(\frac{z_r}{z_2}\right) + \frac{1}{2}\Sigma\Sigma d_{rs} \ln\left(\frac{z_r}{z_2}\right)\ln\left(\frac{z_s}{z_2}\right) + \Sigma\Sigma h_{ik} \ln\left(\frac{w_i}{w_3}\right)\ln\left(\frac{y_k}{z_2}\right) + \Sigma\Sigma r_{ir} \ln\left(\frac{w_i}{w_3}\right)\ln\left(\frac{z_r}{z_2}\right)$$
$$+ \Sigma\Sigma t_{kr} \ln\left(\frac{y_k}{z_2}\right)\ln\left(\frac{z_r}{z_2}\right) + \Sigma u_i GEOGDUM_i + \ln e_\Pi$$

Given that inefficiency measures may vary significantly with different specifications of the profit function, while the ranking of the banks is more stable, we use rank as a measure of (in)efficiency, i.e. the inefficiency variable is ordinal and not cardinal.

The efficiency ranking is determined by the rank of the residuals. Therefore, we rank and partition the residuals into 20 groups, each with the same number of banks (all the banks whose residual is below the fifth percentile, between the fifth and the tenth percentile...); the banks in the group with the highest residuals (most efficient banks) have a rank of 1, the ones in the group with the lowest residuals (least efficient banks) have a rank of 20. The rank may vary from year to year for every bank.

A.2.2. Cost Efficiency

We estimate the same function as for profit efficiency, with the same independent variables but with a dependent variable, variable costs C, defined as interest plus operating costs. The residuals of the following function are used to determine the ranks as for profit efficiency:

$$\ln\left(\frac{C}{w_3 z_3}\right) = a + \Sigma b_i \ln\left(\frac{w_i}{w_3}\right) + \frac{1}{2}\Sigma\Sigma b_{ij} \ln\left(\frac{w_i}{w_3}\right)\ln\left(\frac{w_j}{w_3}\right) + \Sigma g_k \ln\left(\frac{y_k}{z_2}\right) + \frac{1}{2}\Sigma g_{km} \ln\left(\frac{y_k}{z_2}\right)\ln\left(\frac{y_m}{z_2}\right)$$
$$+ \Sigma d_r \ln\left(\frac{z_r}{z_2}\right) + \frac{1}{2}\Sigma\Sigma d_{rs} \ln\left(\frac{z_r}{z_2}\right)\ln\left(\frac{z_s}{z_2}\right) + \Sigma\Sigma h_{ik} \ln\left(\frac{w_i}{w_3}\right)\ln\left(\frac{y_k}{z_2}\right) + \Sigma\Sigma r_{ir} \ln\left(\frac{w_i}{w_3}\right)\ln\left(\frac{z_r}{z_2}\right)$$
$$+ \Sigma\Sigma t_{kr} \ln\left(\frac{y_k}{z_2}\right)\ln\left(\frac{z_r}{z_2}\right) + \Sigma u_i GEOGDUM_i + \ln e_C$$

The banks in the group with the lowest residuals (most efficient banks) have a rank of 1, the ones in the group with the highest residuals (least efficient banks) have a rank of 20. Again, the rank may vary from year to year for every bank.

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