ASSESSING THE PERFORMANCE OF BANKING M&AS IN EUROPE

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A NEW CONCEPTUAL APPROACH

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BRUSSELS

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Rym Ayadi is Head of the Financial Institutions and Prudential Policy Research Programme at CEPS. She gratefully acknowledges the comments of Claudia Girardone and Phil Molyneux at the Wolpertinger Conference on "Banks in a Global World" in August 2006, and from Karel Lannoo, Chief Executive and Senior Research Fellow at CEPS.

ISBN-13: 978-92-9079-732-6

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PREFACE

The European banking sector consolidated at a rapid pace throughout the 1990s. The deregulation of banking activities, the progress made towards the completion of an integrated European financial market, financial globalisation, technological and financial innovations, the imperative of value creation and the introduction of the euro are some of the principal forces that have fuelled this process. Today, it seems that merger and acquisition (M&A) activity has resumed, as evidenced by several recent domestic and cross-border deals in the financial industry. Faced with increased risks, uncertainty and enhanced competition, banking institutions have had to adopt the most economic strategic means to cut their costs and enhance their revenues in order to remain competitive. Moreover, the adoption of most measures under the Financial Services Action Plan (FSAP) and the European Commission's White Paper on financial services policy (2005-2010) towards complete integration of European financial markets will act as further impetus to accelerate consolidation in the financial services industry in the coming years.

Nevertheless, many studies of the M&A wave of the 1990s have found that on average M&As are far from having proved their economic effectiveness. Consequently, one can question the real motives behind these operations for managers and shareholders and their effects on banking profitability, efficiency and welfare.

In this study, we define the underlying strategies behind banking M&As and investigate whether they actually matter in terms of these effects.

To this end, we introduce in this book a new approach based on a conceptual matrix built on the interaction between two criteria that can be used to define the various strategies underlying an M&A: the initial activities of the banks involved and the geographical dimension of the transactions. Using this matrix to sub-categorise 71 cases of banking M&As in Europe, we then assess the profitability and the efficiency (cost and profit) for the acquirers and the targets before and after the operation. The

analysis is based on financial ratios and Data Envelopment Analysis (DEA) to assess both financial and economic performance. The results obtained from both methodologies are then compared.

Our results show that the economic and financial performance of banking M&As depends on their underlying strategies, which are defined by crossing the banks' initial activities and their geographical reach. The optimal combination of these two factors – defining the optimal underlying strategy – could be a critical factor for the success or failure of an M&A.

Rym Ayadi
Brussels
September 2007

1. INTRODUCTION

The European banking sector experienced a rapid process of mergers and acquisitions (M&As) during the 1990s.[1] Figure 1 charts the growth of this phenomenon from 1990-2005. The deregulation of banking activities, the progress made towards the completion of an integrated European financial market, financial globalisation, technological and financial innovations, the imperative of value creation and the introduction of the euro are some of the principal forces that have fuelled the process of banking consolidation in Europe.

Since 2003, the increase in value of domestic and cross-border transactions in the financial services industry suggests a resumption of M&A activity.[2] Indeed, faced with increased risks, uncertainty and enhanced competition, banking, insurance and other financial institutions have had to adopt the most economic strategic means to cut costs and enhance revenues (see Figure 2 for sectoral responses). Moreover, the adoption of most measures under the Financial Services Action Plan (FSAP), the European Commission's White Paper on financial services policy (2005-2010) towards complete integration of European financial markets and the tightening of the procedures that supervisory authorities in the member states are obliged to follow when assessing proposed M&As in the banking, insurance and securities sectors,[3] will act decisively to accelerate the consolidation of financial services in the coming years.

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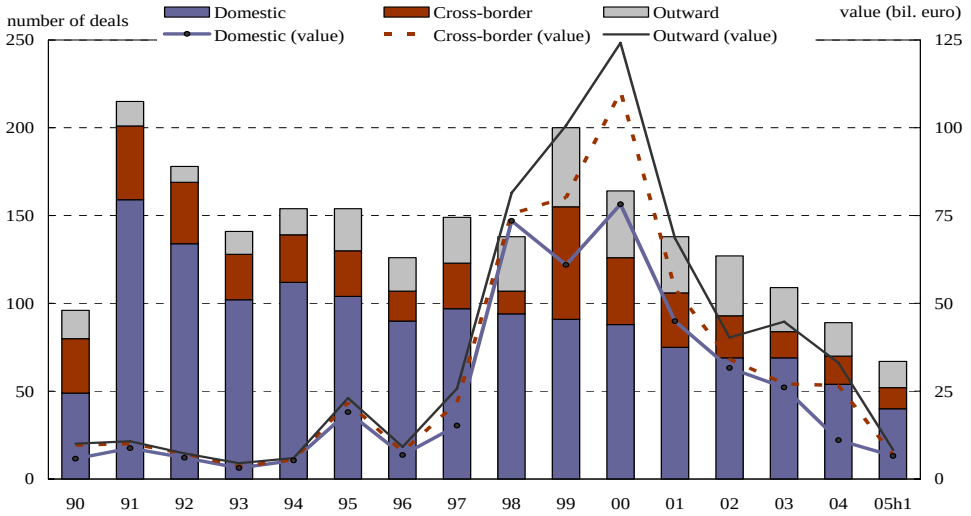
[1] Ayadi & Pujals (2004 and 2005).

[2] Approximately €79 billion of deals in financial services involving a target based in Europe were announced in 2005. Compared with 2004, this is an increase of 76% by transaction value (see PwC, 2006 a, b).

[3] The issue of low cross-border consolidation in the financial sector was discussed at the informal meeting of Economic and Finance Ministers (ECOFIN) in September 2004. The ministers asked the European Commission to study possible obstacles to cross-border mergers and acquisitions in the financial sector, arising both from differing supervisory practices and other, broader factors. Current EU rules allow supervisory authorities to block a proposed M&A if they consider that the 'sound and prudent management' of the target company could be put at risk.

Figure 1. Number and value of M&As in banking in the EU15, 1990-2005

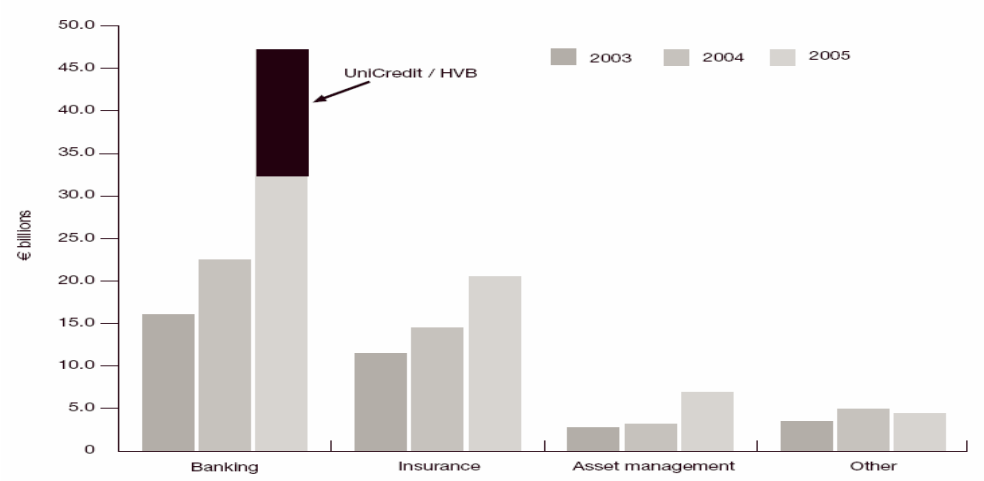


Notes: 2005 figures are annualised. Cross-border M&As refer to transactions in the EU15 involving a non-domestic acquirer. Outward M&As refer to non-EU acquisitions of EU15 banks (only up to 2005Q1). The number of deals is shown on the left-hand scale. The value of deals is represented as stacked lines on the right-hand scale, but is missing for a number of deals.

Source: Thomson Financial SDC (2006).

The resulting proposed Banking Directive provides supervisory authorities with a clear and transparent process for decision-making and notification. In particular, there is now a closed list of criteria against which the acquiring company should be assessed, such as the reputation of the company itself, the reputation and experience of any person that may run the resulting institution or firm, financial soundness, the extent of compliance with relevant EU directives and the risk of money laundering and terrorism financing. Also, the Directive reduces the assessment period from three months to 30 days and allows the supervisory authority to 'stop the clock' only once, under clear conditions. It amends the following existing directives: the Banking Directive (2006/48/EC), the Third Non-life Insurance Directive (92/49/EEC), the Recast Life Assurance Directive (2002/83/EC), the Reinsurance Directive (2005/68/EC) and Directive 2006/48/EC on markets in financial instruments. The proposal was voted in first reading by the Parliament on 13 March, 2007 and will be implemented by the 27 member states as soon as it is published in the Official Journal.

Figure 2. M&A transactions in European financial sectors, 2003-05



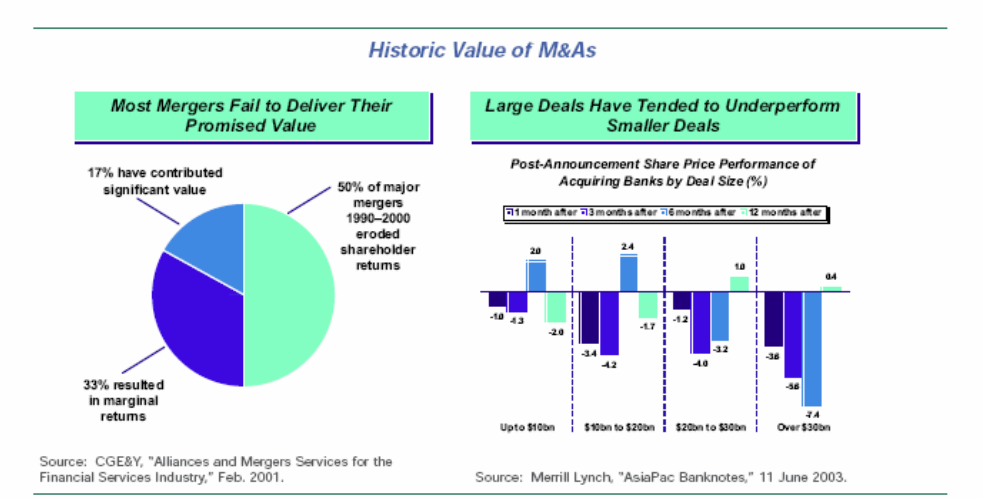
Note: Figure extracted from PricewaterhouseCoopers (2006), "Financial Services M&As 2006"; cross-border deals represented two-thirds of (depicted) total deals for 2005.

Sources: Mergermarket and PwC analysis.

M&As are among the principal responses aimed at achieving external growth, together with the formation of alliances and partnerships. Nonetheless, many studies of the M&A wave of the 1990s have found that M&As are far from having proved their economic effectiveness (see Figure 3).

To explain the underlying economic reasons behind M&As, the empirical literature mainly focused on examining their effects on short- versus long-term performance and then on discerning their effects on the competition in the sector in question. Undoubtedly, economies of scale and scope offer the main explanation behind the performance change following an M&A, leading to a number of empirical studies that aimed at examining the relationship between size and costs. However, these findings were far from conclusive owing to the conceptual and technical limitations encountered when testing for the relevant hypotheses. Nonetheless, scale and scope economies are the foundation for new concepts put forward nowadays to explain concentration in the financial sector in general and in the banking industry in particular. Indeed, if there is little evidence of scale and scope economies in the banking sector, it is important to question the real explanation for any changes in performance.

Figure 3. Performance of banking M&As



In this context, the concept of 'X-efficiency', introduced by Harvey Leibenstein in 1966, deserves particular attention. For a variety of reasons, according to Leibenstein, people and organisations normally do not work as hard or as effectively as they could. In technical terms, X-efficiency refers to the deviations from the production-efficient frontier that depicts the maximum attainable output for a given level of input. This concept seems to offer a greater predictive power today on performance changes in banks in general and in banking M&As in particular.

In addition to scale, scope economies and X-efficiency, M&As could be justified by revenue diversification, risk reduction and market power. The latter is particularly relevant in highly concentrated banking markets and when a merger or an acquisition is targeting the same activity or region.

To test these theoretical justifications, several academic studies have examined the performance change of banking M&As, using either static or dynamic analyses. The former investigates the relationship between size and efficiency and the latter assesses the changes before and after an M&A.[4] Other studies have also tried to examine the impact of an M&A on market power.

[4] Berger et al. (1999).

After reviewing the findings of the main empirical academic research in the US and Europe related to the dynamic analysis of banking M&A performance, we introduce a new approach to categorise and assess banking M&As. This approach is based on a conceptual matrix[5], which is built on the interaction between two criteria that we consider as defining dimensions of the various strategies underlying the M&As: the activity of the banks involved in the M&A and the geographical dimension of the transaction. Then, based on the resulting categorisation of 71 banking M&As in Europe, we assess the profitability and the efficiency (cost and profit) for the acquirers and the targets before and after the operation and we compare both findings. The analysis is based on financial ratios and data envelopment analysis (DEA), which is a non-parametric approach, to assess both profitability and cost and profit efficiency.

[5] This approach is briefly introduced in Ayadi & Pujals (2004) and elaborated in Ayadi (2006).

2. THEORETICAL BACKGROUND

According to the academic literature in banking and industrial economics, a variety of motivations drive consolidation, ranging from value maximisation (including cost reduction and revenue growth) to other external and managerial goals.

2.1 Maximising-value explanations of M&As

The economic literature has justified banking M&As on the ground that it enhances shareholder value. Indeed, the strengthening of the shareholders' role, the increasing importance of institutional investors in banking capital (pension funds, mutual funds, private equity and recently hedge funds), the pressure from financial markets and new corporate governance rules have encouraged managers to orient their business objectives towards value-maximisation.

The traditional argument that M&As increase shareholder value is based on the assumption that the anticipated value of the entity created by the merger of two groups will exceed, in terms of potential wealth creation, the sum of the respective values of the two separate groups. That is: 1+1 = 3. Two main types of synergies are achieved: operating synergies and financial synergies. The former takes the form of either revenue enhancement or cost reduction. The latter refers to the possibility that the cost of capital may be lowered by combining one or more companies.

In theory, M&A operations in the banking sector could create value by obtaining gains either in terms of efficiency or market power. Other motivations of M&As are also briefly discussed since they may partly offer a plausible explanation for certain types of transactions.

2.2 M&As and efficiency

An M&A allows the resulting company to obtain efficiency gains through cost reductions (or cost synergies), revenue increases (or revenue synergies), the exchange of best practices and / or risk diversification. (see Table 1).

Table 1. Synergies announced in recent M&A deals in the EU

Banks	Year	Expected synergies (€ million)	Revenue synergies (%)	Cost synergies (%)
UniCredit-HVB	2005	985*	9	91
SCH-Abbey National	2004	560	20	80
Crédit Agricole-Crédit Lyonnais	2002	760	0	100
Caisses d'Epargne-CDC IXIS	2001	500	85	15
Allianz-Dresdner	2001	1,080	88	12
Halifax-Bank of Scotland	2001	1,113	51	49
Dexia-Artesia	2001	200	15	85
HVB-Bank Austria	2000	500	0	100
RBoS-Natwest	2000	2,335	17	83
BNP-Paribas	1999	850	18	82
BBV-Argentaria	1999	511	0	100
Intesa-COMIT	1999	1,000	50	50
Banco Santander-BCH	1999	630	0	100

* To be achieved in 2008.

Sources: Annual reports and financial press.

Cost synergies result from an improved organisation of banking production, a better scale and/or a better combination of production factors. The core objective is to extract benefits from cost complementarities and economies of scale and scope. In practice, cost synergies might be derived from a) the integration of different skilled teams or information technology infrastructures, b) the combination of different back-office and general services or c) the rationalisation of the domestic and/or international banking networks.

Revenue synergies also derive from a better combination of production factors. Improvements in the organisation of activities, however, offer benefits from product complementarities that help to enhance revenues. In practice, revenue synergies might result from the harmonisation of product ranges, the existing complementarities between activities, cross-selling and the generalisation of a 'multi-distribution channel' approach to the various segments of customers.

It should be noted, however, that revenue synergies are much more difficult to obtain compared to cost synergies, because they depend not

only on managers' decisions but also on customer behaviour. In this respect, several studies have estimated that some 5% to 10% of a bank's customers leave the bank after a merger.[6] Accordingly, M&As between banking institutions in Europe very often have higher targeted cost synergies than revenue synergies.

To achieve the goal of efficiency, two types of strategies can be pointed out. Firstly, in theory, a merger or an acquisition involving two companies with homogeneous activity profiles should lead to economies of scale by reducing the unitary production costs, as a result of an increase in activity volume and a decrease in the fixed costs obtained by combining the support functions (marketing, information technology, physical infrastructures, personnel management, etc.). The final objective is to obtain a competitive advantage in the activities involved.

In Europe, expectations ride high in the reinforcement of retail banking. The strategy consists firstly in merging banking institutions, while maintaining the existing branch network and secondly in implementing upstream cost synergies, i.e. at the level of physical network management. The desire to achieve greater economies of scale can be seen in the recent operations of several retail banks: BHV in Germany, SCH and BBVA in Spain, CIC-Crédit Mutuel in France, Unicredit in Italy and Lloyds TSB or RBoS-Natwest in the United Kingdom.

The second strategy to achieve greater efficiency is adopted in circumstances where banking institutions are operating in heterogeneous but complementary markets. A merger or an acquisition not only allows the resulting company to widen its customers' portfolio but it also leads to a more diversified range of services and offers scope economies by optimising the synergies between the merged activities. Here, the main objective is to increase revenues, rather than to obtain economies of scale. For this, two possibilities could be highlighted according to the complementarities attained through diversifying activities or geographical areas. In the first case, scope economies are generally obtained through a merger or an acquisition either between commercial banks and investment banks, or between banks and insurance companies, as illustrated by a few recent transactions in Europe: Allianz-Dresdner in Germany, BNP-Paribas and Caisses d'Epargne-CDC IXIS in France or San Paolo-IMI in Italy. Similarly, the acquisition of Bankers Trust by Deutsche Bank was

[6] See Burger (2001).

completed mainly to penetrate the American market for investment banking.[7] In the second case, the principle of geographical complementarities has increased the interest on the part of Crédit Agricole to acquire Crédit Lyonnais in France. The first is firmly anchored in the provinces and in rural areas, whereas the second has a strong presence in the Ile-de-France (urban area of Paris) and other large French cities.

In sum, efficiency gains are obtained by input and output adjustments in order to reduce costs, increase revenues and / or reduce risks so as to increase the value added. The restructuring of operations can also allow efficiency gains through the reorganisation of teams (managers and employees) and / or the generalisation of 'best practices'. This is known as 'X-efficiency' (described in the Introduction), which is the managerial ability to decide on input and output in order to minimise costs (or maximise revenues).

Lately, beyond greater economies of scale and scope, efficiency can also be improved by a greater diversification of risks (functional and / or geographical[8]).

Efficiency may be improved following a merger or an acquisition, if the acquiring institution is more efficient *ex ante* and brings the efficiency of the target up to its own level by spreading its superior managerial expertise, policies and procedures.[9] Simulation evidence suggests that large efficiency gains are possible if the best practices of the acquirers reform the practices of inefficient targets.[10]

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[7] One might also mention in this context UBS and PaineWebber or Crédit Suisse Group and DLJ in 2000, and Dresdner Bank and Wasserstein Perella in 2001.

[8] According to Méon & Weill (2001), a comparison of the annual growth rate of real GDP suggests that the economic cycles of many European countries are not perfectly correlated. Consequently, geographical diversification could enable European banks to significantly reduce their risks.

[9] Generally, the acquiring bank in a merger is more cost-efficient and profitable than the institution being acquired. As noted in a recent survey (Berger et al., 1999), this holds for the US (Berger & Humphrey, 1992; Pilloff & Santomero, 1997; Peristiani, 1997; Cummins et al., 1999 and Fried et al., 1999) as well as for Europe (Vander Vennet, 1996 and Focarelli et al., 2002). The expectation is that the more efficient and profitable acquiring bank will restructure the target institution and implement policies and procedures to improve its performance.

[10] Shaffer (1993).

The M&A event itself may also improve efficiency by alerting management to the need for improvement or to implement substantial restructuring. Alternatively, efficiency may worsen because of the costs of consummating the M&A (legal & consultancy fees, severance pay, etc.) or disruptions from downsizing or difficulties in integrating corporate cultures. Efficiency may also decline because of organisational diseconomies in operating or monitoring a more complex institution.

In practice, efficiency gains do not appear to be the only explanation for the recent M&A wave in banking. Gains obtained through increased market power seem to also offer a strong incentive to merge, but the relationship between market concentration and performance has only been partially verified.[11] Seeking other explanations for the current phenomenon, studies carried out in the United States and in Europe tend to confirm that 'managerial hubris', empire-building, mimicry effect and defensive reaction are factors that are likely to play an important role.

2.3 M&As and market power

Theoretically, market power is defined as the capacity to fix market prices as a result of a dominant position in a certain market. The economic literature[12] concludes that prices are positively correlated to local market shares in general, but this position is not justified in the context of international markets (inter-banking activities, multinational companies...). Therefore, increased market power can be gained through a merger or an acquisition of two competing institutions operating in the same local market.

Thus, value creation through market power would seem the more likely explanation for mergers at the local level and within the same activity (especially in retail banking), which appears to be coherent with the theoretical evidence noted above, in particular in the European Union, where the majority of the operations are within sectors and are national.[13]

In practice, banking institutions can influence supply (as a supplier) or demand prices (as a client). In the first case, the size obtained following a merger or an acquisition might create a dominant position which enables

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[11] Rhoades (1998).

[12] Hannan (1991) and Berger & Hannan (1989, 1997).

[13] Vander Vennet (1996).

the bank to manipulate price levels in a certain market either by a) decreasing prices (by pre-emption and/or predation[14]) to evict some non-competitive existing banking institutions and/or new entrants, or b) increasing prices in the absence of effective competition in the marketplace.[15] In the second case, the size obtained will enable the new group to reduce its refinancing costs owing to reputation, size or diversification effects.

Nevertheless, several studies[16] have shown that the previous correlation between concentration levels and market power diminished during the 1990s. This change could be attributed to the opening up of markets which has encouraged the entry of new competitors and thus increased the degree of contestability in the market.[17] Moreover, the emergence of new distribution channels such as e-banking, while contributing to the disappearance of the geographical boundaries, has made the concept of 'local market' less relevant.

Based on the hypothesis of the increase of market power, it appears that the creation of mega-banks, by altering effective competition, does not allow for any immediate profit for consumers because of dominant position abuses[18] and consumers' surplus capture.

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[14] *Pre-emption* implies that the price fixed by the bank is lower than the average cost while *predation* involves fixing the price at a level lower than the marginal cost.

[15] Market power can be gauged by looking at the transmission of market interest rates to bank retail rates.

[16] Hannan (1997) and Radecki (1998).

[17] A contestable market displays low barriers to entry and exit (Baumol et al., 1982). In such a situation, potential competitors may engage in hit-and-run behaviour to take advantage of the super normal profit situation of the market. Contestability hinges on the absence of exit costs (called 'sunk costs'), which are the costs that cannot be recovered by transferring assets to another use or by selling them. Entry to the financial services sector requires substantial investment that tends to be sunk to a high degree.

[18] The possibility of a cartel forming in banking is not purely theoretical and can be prejudicial for effective competition, as shown by the 'Cruickshank report' (2000) in the UK and in Canoy & Onderstal (2003) in the Netherlands.

2.4 Other non-maximising value explanations of M&As

When control and ownership are separated within the firm,[19] managers can pursue other objectives than maximising shareholder value or increasing profit. Instead of enhancing shareholders' wealth, a manager might prefer to serve his/her own interests. Therefore, it is possible that a merger or an acquisition is simply a result of a heuristic way of addressing optimism[20] and/or mainly dictated by the power, prestige and/or higher compensation that are related to the management of a larger firm, which is in line with the empire-building hypothesis.[21] In that case, it is the desire for power[22] that is expressed, and not the direct interest of the shareholders. This situation is more likely to arise where shareholding is dispersed and passive.

M&A operations can also be triggered by a mimicry effect following the consolidation process initiated by competitors in the marketplace.[23] Indeed, within a relatively concentrated sector, the actions of the major 'player(s)' might have an immediate impact on the behaviour of others, inducing in turn a homogeneous behaviour. As John Maynard Keynes once said, "worldly wisdom teaches that it is better for the reputation to fail conventionally than to succeed unconventionally".

During the last two decades, indeed, the development strategies in the banking industry were very often induced by common strategic standards, which have led to a rather homogeneous behaviour. As shown in the 1980s, the commercial strategies of banking institutions were marked by a race to achieve a larger size. Similarly, in the 1990s, enhancing the profitability of shareholders' equity became the new development standard. Today, targeted value creation represents the major strategic issue in modern banking management circles.

Moreover, the acceleration of M&A operations could also result from a defensive reaction on the part of a few actors against competitors'

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19 Referred to as 'agency relation' by Jensen & Meckling (1976).

20 "*Bidding firms infected by hubris simply pay too much for their target*" (Roll, 1986, p. 1). *"If there actually are no aggregate gains in takeover, the phenomenon depends on the overbearing presumption of bidders that their valuations are correct"* (Ibid., p. 5).

21 Jensen (1986).

22 According to 'managerial theory' (see Berle & Means, 1932; Williamson, 1964).

23 Also called a 'follow the leader' strategy.

initiatives. Indeed, as the wave of mergers spreads, banking institutions that have remained outside the process are likely to become themselves a potential target in a hostile takeover transaction. To protect themselves from possible predators, managers can pursue an active acquisition policy in order to maintain their position.

Numerous M&As carried out recently in fact seem to have been dictated by the desire to modify the existing equilibrium and to be proactive to others' actions. Sometimes disguised as a hypothetical value creation move, a number of these operations are primarily the reflection of the single market impetus, where mergers have simply become the objective rather than the result of careful strategic thinking. Most European banking institutions, reacting to the increased contestability of their national banking market, have sought to strengthen their national position, in order to improve their profitability and to protect their position from new competitive entrants.

Finally, the new mechanisms of corporate governance, including takeover threats, large and activist shareholders and effective boards, may offer a plausible explanation for the recent banking consolidation process. Committed to ensuring the growth of their companies to satisfy internal pressure while maintaining their competitiveness to withstand fierce external competition and forced to provide equity capital to which pressing remuneration requirements are attached, bank managers have pursued external growth through M&As as a strategic means to expand their activities.

3. EMPIRICAL FINDINGS

Several studies have tried to assess the performance of M&As in banking in the 1990s. The majority have concentrated on the impact on shareholder value and efficiency on the one hand, and on the consequences for customers – households and SMEs (small- and medium-sized enterprises) – via the increase of market power on the other hand.

Concerning the impact of M&As on shareholder value and efficiency, the results were mixed. Several academic studies have been carried out mainly in the United States, using a wide range of methodologies, from the most basic (event studies or balance-sheet-based indicators) to the most sophisticated (efficiency frontiers), but their findings have not been conclusive.

The studies on the impact of mergers on consumer welfare focused primarily on the possible market power effect without considering that under certain conditions, M&As might improve the consumers' surplus.

3.1 Banking M&As and value creation: Results are still inconclusive

A large number of event studies have been carried out to assess the effects of M&As on stock market values. They all tend to evaluate the change in total market value of the acquiring company plus target institutions – adjusted for changes in overall stock market values – associated with an M&A announcement. This change embodies the present value of expected future changes in terms of efficiency and market power. Although these effects cannot be disentangled, the change in market value may be viewed as an understatement of the expected efficiency improvement, since it is unlikely that an M&A would reduce the market power of the participants.[24]

[24] Berger (2003).

In the US, the empirical results were mixed.[25] On average, the combined shareholder value (i.e. the bidder and the target) is not affected by the announcement of the deal since the bidder suffers a loss that offsets the gains of the target.[26] Therefore, an M&A only implies a transfer of wealth from the shareholders of the bidder to those of the target. Compared to the 1980s, however, the evidence from the 1990s was more favourable where average abnormal returns have been higher for both bidders and targets.[27]

Other studies examined the stock market's reaction to different types of deals. Houston & Ryngaert (1994) found that the combined gains tend to be greater when the bidding firm is unusually profitable or when there is significant overlap between institutions. The first result is consistent with a market for corporate control favouring competent over incompetent managers. The second result is consistent with the market power hypothesis, according to which a higher market share leads to higher profits. DeLong (2001) found that mergers that concentrate banks geographically or in product create value, while those that diversify them don't create value.

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[25] Rhoades (1994) and Pilloff & Santomero (1997) provide a survey of event studies. Some studies of US banking M&As found increases in the combined value around the time of an M&A's announcement (Cornett & Tehranian, 1992 and Zhang, 1995); others found no improvement in combined value (Hannan & Wolken, 1989; Houston & Ryngaert, 1994; Pilloff, 1996 and Kwan & Eisenbeis, 1999); while still others found that the measured effects depended upon the characteristics of the M&A (Houston & Ryngaert, 1997). A study of domestic and cross-border M&As involving US banks found more value created by cross-border M&As (DeLong, 1999).

[26] Stock market event studies of bank mergers have shown that merger announcements typically result in a fall in the equity value of the acquiring firm and no significant gain in the combined value of the two firms together. This result suggests that the market believes that, on average, there are unlikely to be substantial gains realised from bank mergers. And since the value of the acquiring firm typically falls, the market also believes that acquiring firms tend to overpay for acquisitions in anticipation of merger benefits that are not likely to be realised. This is a common finding and is not limited to bank mergers, which points in the direction of a more general problem associated with the corporate governance of M&As.

[27] Becher (2000) and Houston et al. (2001).

On the other hand, Zhang (1995) found results consistent with the diversification hypothesis, according to which geographical diversification leads to a lower variability of income; and that out-of-market transactions create value for shareholders. Higher market concentration is likely to lead to an increase in prices for retail financial services, leading in turn to an increase in profits. It is also true, however, that firms operating in more concentrated markets are generally found to be less efficient.[28] This effect might offset the gains from an increase in market power and thus leave unchanged the market value of the bank.

In Europe, the few studies carried out to assess the value creation through M&As in banking found positive abnormal combined returns. In the study conducted by Van Beek & Rad (1997), these returns were not statistically significant. In contrast, Cybo-Ottone & Murgia (2000) found that shareholder value gains were positive and significant, mostly driven by domestic bank-to-bank deals and diversification of banks into insurance. In 2001, Beitel & Schiereck found an increase of the combined value of bidders and targets for domestic M&As but a decrease in the case of cross-border M&As. These findings were confirmed in Beitel et al. (2004) on a sample of 98 M&As in 1985-2000, showing that transactions that concentrate the same activities as well as those whose targets are less performing increase value.

These positive abnormal returns, however, do not necessarily mean that mergers improve efficiency; in fact, one possible explanation for the difference between the European and American markets is that weaker antitrust enforcement in some European countries allows gains in monopoly power from in-market mergers.

Finally, according to the business consulting literature, it seems that the large majority of M&As carried out recently, in Europe or in the US, are far from having proved their effectiveness in terms of value creation in the short run.[29]

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[28] Berger & Hannan (1998).

[29] According to AT Kearney (1999): “58% of the M&As announced and completed are unfortunately a failure. Indeed, the stock market value of the merged entity two years after the operation is lower than the sum of both separated partners three months before.” Similarly, according to a KPMG survey (2001): “30% of the M&As have increased the shareholders’ value, 39% haven’t brought any considerable change and almost 31% have destroyed value”. In other words, 70%

The empirical research based on event studies should however be taken with caution since the methodology suffers from several limitations. One problem is that the announcement of a deal mixes information concerning the proposed merger with information on its financing. Because investors consider the announcement of a stock issuance as 'bad news', the negative returns to the bidding bank could reflect the fact that mergers tend to be financed with stocks. Consistent with this notion, one study finds that returns to bidders are significantly higher when mergers are financed with cash in comparison with mergers financed with new equity.[30] Also, event studies rely heavily on investors' perceptions and their expectations of the future gains when there are rumours around the transactions. This may result from pure speculative behaviour.

3.2 Banking M&As and efficiency

The studies carried out on a sample of US banks showed, on average, very little or no improvement in *cost efficiency* from M&As in the 1980s.[31] However, the results of studies using data from the 1990s were mixed.[32] On the one hand, some found that mergers produce no improvement in banks' cost efficiency,[33] especially when the deals involve very large banks.[34] It was also shown that on average, smaller banking institutions tend to exhibit larger variations in X-inefficiencies than larger institutions.[35] This

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of mergers were unsuccessful in producing any business benefit as regards shareholder value. Finally, according to Merrill Lynch (2003), not only do most mergers fail to deliver their promised value, but large deals have tended to perform worse than smaller ones. And at least 50% of major mergers since 1990 have eroded shareholder returns (see Figure 3).

30 Houston & Ryngaert (1997).

31 Berger & Humphrey (1992), Srinivasan (1992) and Pilloff (1996).

32 One limitation applies to this literature: the efficiency gains or losses associated with M&A activity may take a very long period of time to materialise, but these studies only focus on a short period before and after each M&A (see Berger, 2003).

33 Peristiani (1997), Berger (1998) and Rhoades (1998).

34 Akhavein et al. (1997) and Berger (2000).

35 X- inefficiencies have been broadly investigated in the US but without giving a final answer. Indeed, the first cause is linked to the size; on average, operating costs of larger banks are found to be closer to the optimal frontier curve than those

may be due to the organisational diseconomies of operating larger firms in relation to disruptions from the M&A process, which may offset most potential efficiency gains. And on the other hand, other studies found cost reductions also obtained for very large US banks.[36]

The evidence for European banks is broadly consistent with the US results. Domestic mergers among banks of equal size seem to improve cost efficiency, but these results do not hold for all countries and all banks.[37] Nationally, studies on Italian banks[38] or UK building societies[39] found significant cost-efficiency gains following an M&A. Moreover, simulation evidence suggests that a cross-border acquisition may be associated with a reduction in the costs of the target, while little effect is found for domestic M&As.[40] Conversely, Vander Vennet (2002b) found no tangible gains in terms of cost efficiency in the case of cross-border M&As. The difficulties in improving cost efficiency may be related to the obstacles often encountered, especially in continental Europe, in reducing a bank's labour force. In fact, personnel reduction, one of the main sources of savings, is hardly an option in countries with rigid labour markets.[41]

Studies on *profit efficiency* of US banks more often found gains from M&As. The fact that cost efficiency is, on average, little improved as a result of a bank merger does not necessarily mean that there is no

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of smaller banks to their respective cost frontier (Kwan & Eisenbeis, 1999). This could be explained by the fact that larger banks operating in metropolitan markets are more likely to face stronger competition than smaller banks, which are more likely to operate in suburban or rural areas. The second reason is linked to risk taking; inefficient institutions are found to take in a higher level of risk (Gorten & Rosen, 1995). It is indeed very likely that managers of inefficient banks are more inclined to compensate the operating inefficiency by taking on more risk which may reward them with a higher yield. Finally, the third reason is the financial condition which is linked to the percentage of problem loans and other illiquid positions in the balance and off balance sheets. The correlation between poor asset quality and inefficiency may be an indication of poor management.

[36] Houston et al. (2001).

[37] Vander Vennet (1996).

[38] Resti (1998).

[39] Haynes & Thompson (1999).

[40] Altunbas et al. (1997).

[41] Focarelli et al. (2002).

improvement in profits. Profit efficiency incorporates both costs as well as revenue efficiency. Revenue efficiency can be improved by simply raising prices as market power[42] expands through the merger process itself. Or revenues may rise because the merged institution restructures its assets mix.

Two studies in particular have attempted to determine the profit effects of mergers. Akhavein et al. (1997) found little change in cost efficiency but an improvement in profit efficiency of large US banks from 1980-90 following M&As, especially when both merger participants were relatively inefficient prior to the merger.[43] Also, after merging, banks tended to shift their portfolios to take on more loans and fewer securities. They attribute gains in profit efficiency to the benefits of risk diversification: larger banks have more diversified loan portfolios and lower equity-asset ratios. But their measure of profit efficiency does not account for changes in risk likely to result from such a portfolio switch. Berger (1998) found similar results in a study that included all US bank mergers, both large and small, from 1990 to 1995.

In Europe, Vander Vennet (1996) found that domestic mergers of equals in European countries have a positive impact on profitability, mainly driven by improvements in operational efficiency. As regards cross-border M&As, he only found a partial profit efficiency improvement that may be caused by changes in the pricing behaviour of the acquired banks.[44] Focarelli et al. (2002) found that Italian deals that consist of the purchase of a majority (but not all) of the voting shares of the target appear to result in

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[42] Many studies of market structure, price conduct and profit performance found that higher bank concentration is significantly associated with lower prices for deposits, but the relationship between higher concentration and higher profits is often mixed, being sometimes significant and sometimes not. Berger and Hannan, (1998) found that cost efficiency tends to be lower in markets where concentration is higher. Indeed, higher concentration (market power) may lead to higher prices and revenues but, with less competition, the incentive to reduce costs to their minimum levels is blunted. So, the higher revenues are largely absorbed in higher costs rather than contributing fully to expanded profits. From this perspective, market concentration seems to have a greater negative effect on cost efficiency than it does on prices.

[43] Other relevant studies include Berger (1993), Berger & Mester (1997), Clark & Siems (1997), Cummins et al. (1999) and Berger (2000).

[44] Vander Vennet (2002b).

significant improvements, mainly due to a decrease in bad loans. For full mergers, they observe that Italian banks aim to change their business focus towards providing a broader range of financial services and thus increase their non-interest income, rather than to obtain efficiency gains. After the merger, they observe an increase in profitability in the long run that is also related to a more efficient use of capital.

3.3 Banking M&As and market power

The effects of an M&A on the collective welfare – mainly via prices – depend on numerous factors.

Firstly, it is necessary to distinguish between national and cross-border M&A operations. Prior studies of the pricing effects of M&As[45] found that national consolidation, by strengthening the degree of concentration, could generate substantial market power, which is likely to be harmful for households and SMEs.

However, the few existing studies on European bank mergers seem to conclude that there are often significant efficiency gains which result in better conditions for consumers. Huizinga et al. (2001) analysed 52 major mergers between European banks between 1994 and 1998, which were found to be largely '*socially*' beneficial. Some other studies found strong evidence of positive effects of M&As at a country level, leading to more favourable prices for consumers.[46]

Conversely, cross-border M&A operations would intensify competition in the domestic market but do not change the banks' local market shares. Consequently, the national authorities, after having encouraged the formation of 'national champions', should promote cross-

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45 Berger et al. (1998 and 1999).

46 A number of further studies exist at the country level. For example, by distinguishing between short-run and long-run effects of M&As, Focarelli & Panetta (2002) have found strong evidence that these effects are different. Precisely, they showed that national mergers leading to deposit rate changes are unfavourable to consumers in the short-run, but in the long run, if banks succeed in reducing costs, efficiency gains from mergers prevail over the market power effects, so that consumers benefit. Hence, the adverse price changes generated through consolidation are by all means temporary. Thus, studies restricted to a short post-merger period might fail to register the efficiency gains and as a consequence overestimate the adverse price changes.

border and particularly pan-European operations. However, this hypothesis is relatively relaxed in view of the cross-border consolidation wave in Eastern European countries. Competitive concerns in these markets may arise if cross-border players reach the concentration threshold perceived to be harmful to consumers.

Secondly, it is also essential to distinguish M&A operations according to the 'means' used – market power or efficiency gains – to create shareholder value. If the value creation occurs primarily through increased *market power*, the transaction would only constitute simple profit redistribution in favour of shareholders, but to the detriment of the customers, employees and public authorities, without a net gain in terms of collective welfare. In this case, the transaction involves a simple redistribution between the various stakeholders of the banking institution, which does not create wealth for the economy because the increase of banking profits is much lower than the welfare loss suffered by the other economic agents.

On the other hand, value creation obtained through the improvement of *efficiency* (through scale and / or scope economies, risk diversification...), will benefit not only the shareholders, but also the customers (price drop and / or improvement in the quality of the services) and the public authorities (higher solvency). For the employees, the results remain unclear. The overall impact of the consolidation process remains ambiguous, according to whether market power or efficiency effects would prevail.

4. A NEW CONCEPTUAL APPROACH TO ASSESSING M&AS IN BANKING

The empirical evidence suggests that M&As in banking do not significantly improve cost and profit efficiency and, on average, do not generate significant shareholder value. These results seem to contradict the motivations cited by practitioners for consolidation strategies, which are largely related to economies of scale and scope and to improvements in management quality. However, there are a few possible explanations for the divergence between the empirical evidence and bankers' beliefs.[47]

In general:

1. The lack of clear-cut results on the effects of M&A could reflect difficulties in measuring efficiency improvements.
2. Studies restricted to short post-merger periods might fail to detect value gains that can only emerge slowly, after some years. For example, studies restricted to a short post-merger period might fail to account for the efficiency gains of consolidation.[48] Long lags in the improvement of performance may reflect difficulties in refocusing lending policies, rationalising branches, integrating data processing systems and operations, and training the personnel of the target to market the new owner's products.[49] Moreover, culture clashes may be

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47 Amel et al. (2002).

48 In an analysis of the effects of M&A in the market for bank deposits, Focarelli & Panetta (2002) find that in the short run the costs of restructuring the consolidated bank cancel out the gains, which cannot fully emerge for years. In the long run, however, the efficiency gains dominate over the market power effect, leading to more favourable prices for consumers.

49 Berger et al. (1998) and Calomiris & Karceski (1998) mention three years as the gestation period needed to restructure the merged bank. This is consistent with the

especially harmful in banking,[50] as the relationship with customers depends heavily on soft information[51], which is more difficult to transfer than such hard information as balance sheet data. The resignation of key executives or the emergence of morale problems due to reassignments or employee turnover may cause a loss of information, especially when the new management has little time to develop customer information.

3. Deals done in the past might have suffered from stricter regulation that prevented firms involved in an M&A from reaping all the benefits of the deal. For example, the limitations imposed by the Glass-Steagall Act on the range of US banks' financial activities could have impeded the realisation of gains from cross-selling. Similarly, restrictions on bank branching or on geographical expansion could have hampered the exploitation of scale economies. This view suggests that the deregulation of banking in all major countries (e.g. the Riegle-Neal Act or the Gramm-Leach-Billey Act in the US) might increase the potential for scale and scope economies. The evidence available for the 1990s in the US is consistent with this view.
4. The fact that mergers often occur in waves makes it hard to separate the effect of a single deal from transformations experienced by the industry as a whole.
5. Another possibility is that – in the presence of agency problems between managers and shareholders – M&As could be mainly driven by non-value maximising motives (such as 'managerial hubris' and/or empire building etc). Non-value maximising motivations for M&As have been analysed in recent papers that examine the relationship between executive compensation and M&A activity.

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results of the interviews conducted by the Federal Reserve Board staff with officials of banks involved in mergers (Rhoades, 1998). In a study of US bank mergers, Houston et al. (2001) find that cost savings and revenue gains take two to four years.

[50] Practitioners indicate that 'differences in corporate cultures' is one of the main obstacles to the completion of bank mergers in all the major industrial countries (see BIS, 2001).

[51] This condition is relaxed with the implementation of Basel II. Banks are required to collect as much data as possible from their customers to compute the parameters set by the regulators to calculate minimum capital requirements.

According to these studies, the motivations of M&As could be traced back to managers' desire to increase their compensation (CEOs of larger institutions earn higher compensation). There is some evidence that CEOs with higher levels of stock-based compensation relative to cash-based compensation are less inclined to lead their institutions to make acquisitions.[52] Moreover, managers without a large stake in their banks are more likely to get involved in non-value maximising mergers.[53] Thus, managerial hubris and empire-building may be important reasons for the lack of conclusive evidence on the benefits of M&As among banks during the past decades.[54]

6. Finally, traditional banks which historically provided deposits and loans simply do not exist nowadays.[55] Banks became highly diversified institutions organised around different activities (retail banking, investment banking, private banking and asset management…) and each of these activities obeys a specific business model. As a consequence, academic analysis should focus on a bank as a multi-line business rather than considering it as a mono-line business. However, difficulties in the availability of data are not easy to solve simply because there is not yet a single definition for one or another banking activity at a national, regional or international level. This is a real impediment to the collection of a homogeneous and comparable set of data for banking institutions.

Particularly in Europe:

1. The rigidity of labour markets makes it difficult to reduce overlapping costs in the process of restructuring following M&As, which limits the potential of variable cost savings. Moreover, the remaining obstacles[56] to an integrated European financial market hamper the exploitation of potential cost and revenue synergies. The

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[52] See De Vincenzo et al. (2006), Bliss & Rosen (2001). Similar results on the existence of agency problems in the banking industry can be found in Gorton & Rosen (1995) and Ryan (1999).

[53] Palia (1993).

[54] Pilloff & Santomero (1997).

[55] Pastré (2006).

[56] Identified in a survey conducted by the European Commission in 2005 (see Annex 1).

latter reason could be overcome in the coming years thanks to the European Commission's efforts to foster financial market integration.

2. The difficulties stem from the fact that the M&A phenomenon in financial services is still fairly new to have produced sufficient empirical results worthy of serious academic study. As a result, the majority of the studies have mainly focused on the US,[57] but lessons cannot automatically be applied to the European environment since the regulation and the structure of European banking markets are fundamentally different.[58] Moreover, over the past years, the European financial market has been undergoing fundamental regulatory changes including some 45 measures that will certainly impact the organisation of the European financial industry in the future.

3. Moreover, it is quite difficult to come up with general rules to assess M&As because each one depends on the particular context in which it was carried out (such as the flexibility of the labour market, the applicable takeover regulations including the spectrum of takeover mechanisms, the effectiveness of corporate governance rules, the liquidity of the capital market, the different sizes of the institutions involved, their original activities, their geographical outreach, their corporate structure (private, hybrid or public) and also the intrinsic characteristics of the operation (friendly or hostile, cash or equity financed, etc.).

Building upon the theoretical background of M&As in banking and considering the fact that the empirical literature has assessed M&As either by breaking down the sample according to the geographical or activity dimension, we introduce a new approach based on a conceptual matrix that is constructed on the interaction between these two dimensions. We

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[57] DeLong & DeYoung (2004) have advanced the 'learning by observing' hypothesis which supposes that the mergers of the mid- or late 1990s would have been more likely to create value than the mergers of the 1980s, due to the fact that bank managers would have benefited from having observed a large number of mergers before starting one. This is typically linked to the information spillover hypothesis. It also suggests that the stock market would have been a more accurate predictor of the long-run performance of banking mergers announced during the 1990s than those announced during the 1980s.

[58] Dietsch & Oung (2001).

consider sufficient – as a first step – to define the various industrial logics or strategies underlying the M&A: the initial activities of the banks involved in the M&A and the geographical dimension of the transaction.

When examining the effects of M&As on banking performance (financial, economic and regulatory), the application of this matrix has many advantages:

1. It allows the categorisation of M&A transactions according to specific characteristics. This takes into consideration the level of diversification of the banking activities and the level of geographical outreach before and after the transaction.
2. The analysis of banking performance before and after an M&A is more targeted towards the objectives set in terms of the industrial logic of the newly formed institution. Therefore, the results are easier to interpret and compare.
3. It defines a set of strategies that are useful for analysing the future of the banking industry in terms of business model (a reinforcement of specialised versus multi-specialised banking).
4. It allows the definition of an optimal strategy[59] that enhances banking performance (financial/economic and regulatory). In particular, the optimal strategy is the solution to an objective function that maximises the profit (minimises the cost) of the newly formed entity under resources constraints.
5. It eases the task of competition authorities in investigating suspicions of anti-competitive behaviour.
6. It offers a good tool for regulators when examining the development of the banking industry in terms of risk and returns.

By plotting the possible activity profiles and geographical scopes of M&As in the banking industry on a matrix (hereinafter called an 'AG matrix'), we identify six industrial logics or strategies (S1-S6), as shown in Table 2.

[59] Ongoing work by the author aims to define a model that computes the most desirable combination of activity/geography that allows an optimisation of banking performance following a merger or and acquisition.

Table 2. Activity/geography matrix

		Geographical scope		
		National		Cross-border (EU)
Activity profile		Same region	Different regions	
	Homogeneous	Reinforcement of activities locally (S1)	Reinforcement of activities nationally (S2)	Reinforcement of activities cross-border (S5)
	Heterogeneous	Expansion of activities locally (S3)	Expansion of activities nationally (S4)	Expansion of activities cross-border (S6)

Legend:

S1: M&As between institutions with homogenous profiles and operating locally aim at focusing the initial activities locally. This strategy is specific to European countries with a strong presence of local and regional banks, particularly savings and cooperative banks.

S2: M&As between institutions with homogenous profiles and operating nationally aim at focusing the initial activities nationally.

S3: M&As between institutions with heterogeneous profiles and operating locally aim at expanding the range of activities locally.

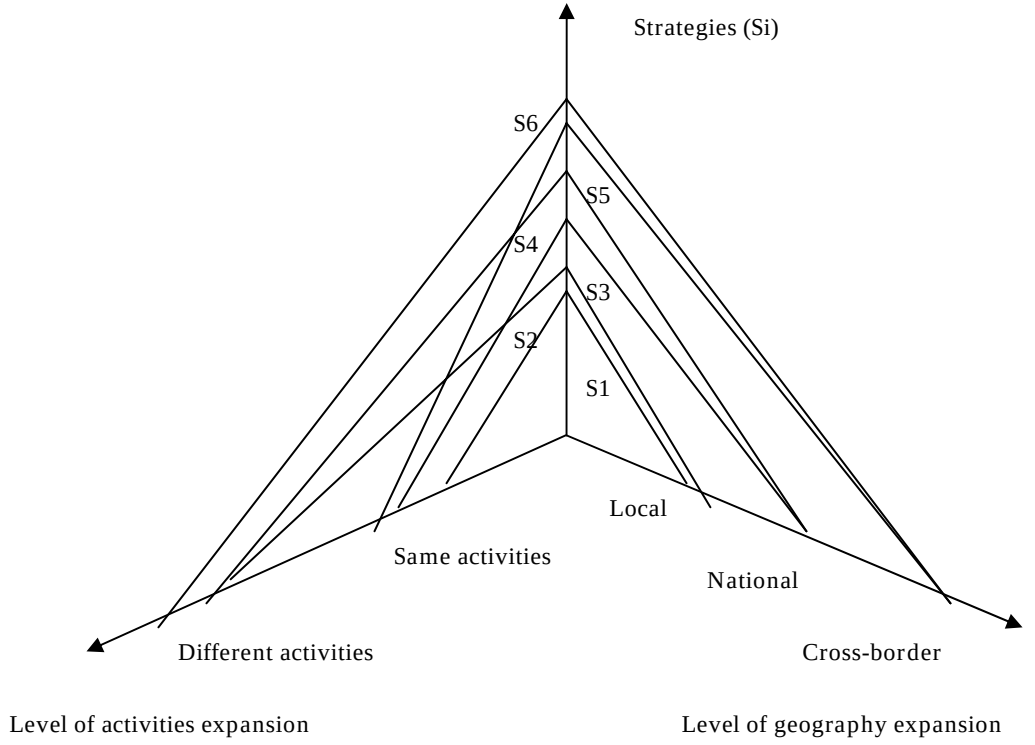
S4: M&As between institutions with heterogeneous profiles and operating nationally aim at expanding the range of activities nationally.

S5: M&As between institutions with homogenous profiles and operating across border aim at focusing the initial activities at a cross-border level.

S6: M&As between institutions with heterogeneous profiles and operating across border aim at expanding the range of activities at a cross-border level.

As we illustrate below (Figure 4), the application of the A/G matrix can offer a useful tool for managers to decide about their best strategy in terms of geographies and activities expansion when studying an M&A project. The horizontal axes define the levels of activities and geographical expansion for each institution. The interaction between both levels would define the generic strategy of the M&A (S1, S2, S3, S4, S4, S5 or S6). This approach would therefore allow a manager to define the best strategy of the M&A which combines optimally the levels of activities and geographical expansion. Theoretically, this translates into optimal input/outputs combinations of the two merged entities. However, the optimal strategy for a bank should be well quantified – for example, an optimal strategy would be the one that fully exploits cost and revenue synergies and increases solvency under resources constraints.

Figure 4. Underlying strategies of M&As



In the banking sector, when an M&A occurs with the aim of focusing their activities locally, domestically or across borders, there is an expectation that the resulting enterprise will be able to cut costs and benefit from scale economies, while increasing market presence which does not necessarily increase market power. Conversely, when an M&A occurs between banks with the aim of expanding their activities locally, nationally or across borders, there is an expectation of increased revenues and the opportunity to benefit from scope economies.

Opting for one or the other underlying strategy would not only impact the profitability and efficiency of the banks involved in the M&A transaction, but also would impact their future development and business model.

Bank managers whose objective is to pursue a specialisation strategy would be more inclined to opt for M&As that concentrate the initial activities of his / her institution.

On the contrary, if the aim is to pursue a multi-specialisation strategy, bank managers would be expected to target institutions with a different functional and geographical profile but with large potential for complementarities.

5. ASSESSING THE PERFORMANCE OF BANKING M&AS IN EUROPE

We propose to apply this new approach based on the analysis of the various strategies underlying banking M&As to assess the performance of these operations. To categorise banking M&As, we use the A/G matrix built on the interaction between the activity of the banks involved in the M&A and the geographical dimension of the transaction. Then, based on a categorisation of the M&A, we assess the profitability and the efficiency (cost and profit) for the acquirers and the targets before and after the operation. The analysis will be based on financial ratios to assess profitability and on data envelopment analysis (DEA) to calculate cost and profit efficiency.

5.1 Methodology

The profitability and efficiency analysis based on balance sheet indicators and efficiency scores consists of describing costs, revenue, risk and efficiency. Each of these indicators is analysed at least one year before and three years after the merger for the acquirers and the targets and compared to a control group of non-merged banks along the period 1996-2003 (Table A2.1 in Annex 2). The three-year time period was used because it is more likely that gains would appear at least one year after the merger and then all gains would be realised within three years.

For the pre-merger period, ratios for both the acquirers and the targets are examined to get an indication of the relative performance of the acquirer and the target. In addition, ratios for the control group were examined to provide a basis for comparing performance of the merged institutions to non-merged institutions that are similar in term of size, type and location.

For the post-merger period, the focus of the analysis is on the combined institutions for mergers and separate institutions for acquisitions relative to the control group. The control group was particularly valuable as it permits an assessment of whether any observed changes in the

combined firm simply reflects changes in the economic environment or instead were due to the merger or acquisition.

Post-merger data were compared with the pre-merger data to determine what changes occurred in performance following the merger or the acquisition (see Table A2.2 in Annex 2).

We perform a dynamic analysis of cost and profit efficiency and profitability on a sample of 71 mergers and acquisitions that took place in the period 1996-2000, broken down on the basis of geographical ambitions (domestic vs. cross-border) and by their underlying strategies, which will be defined subsequently.

Application of the A/G matrix to assess M&As' performance

In this paper, we focus exclusively on banking activities and on the transactions that occurred in the EU15 plus Norway. By using the A/G matrix, we identify different industrial logics or strategies depending on whether the M&As involve banks with homogeneous versus heterogeneous activity profiles and whether they are undertaken in the same or different geographical areas (local/national versus cross-border but within the EU).

The geographical dimension is defined by looking at the location of the bank's headquarters, whereas the activity profile is defined by reference to the banks' revenue structures.

It is difficult to define with certainty the activities of European banks since disclosure requirements are such that only very few banks provide information on the character of their loan portfolios or the different types of non-interest income generated by the different business units. For our analysis, therefore, we use a pragmatic approach for the definition of homogeneous versus heterogeneous activities.[60] Although we rely on broad revenue and asset-based measures of diversified versus focused activities, we do not think this will bias our results since interest versus non-interest revenue is a fair indication of whether a bank is pursuing traditional intermediation versus other financial activities.

Our preferred measures are the revenue-based measures since they capture the banks' different sources of income. We calculate the difference between the interest revenue from lending divided by total revenue and

[60] This same methodology is used in Baele et al. (2006).

the difference between non-interest revenue divided by total revenues before the transaction for the acquirer and the target to define the activity profile of the banks involved in M&A.

Table 3. Revenue components in banking M&As

Transaction (i)	Proportion of interest revenue from lending / total revenue for the acquirer before the transaction	Proportion of interest revenue from lending / total revenue for the target before the transaction	Difference	Proportion of the non-interest revenue / total revenue for the acquirer before the transaction	Proportion of the non - interest revenue / total revenue for the target before the transaction	Difference
Transaction (1)	IRa(1)	IRt(1)	IRa(1) - IRt(1)	NIRa(1)	NIRt(1)	NIRa(1) - NIRt(1)
Transaction (i)	IRa (i)	IRt (i)	IRa (i) - IRt (i)	NIRa(i)	NIRt(i)	NIRa(i) - NIRt(i)

When breaking down the revenue into interest revenue from lending and non-interest revenue (revenues from commissions and trading activities), we could define the different banks' activities. The ultimate objective is to classify the activities into homogeneous or heterogeneous profiles, according to the following basic guidelines:

- The proportion of interest revenue over total revenue is an indication of the extent to which the banks are involved in the traditional activities of deposit and lending.
- The proportion of non-interest revenue over total revenue is an indication of the involvement of the banks in other activities, ranging from trading and other financial services (underwriting and distributing securities, providing payments and cash-related services, etc.).

The table below shows the calculations used to produce ratios before the announcement of the transaction

Table 4. Ratio calculations prior to announcement of a transaction

Data relative to transactions at year (X)	**Before (Xb)**
1996	X
1997	((X-1)+(X)) / 2
1998	((X-2)+(X-1)+(X)) / 3
1999	((X-3)+(X-2)+(X-1)+(X)) / 4
2000	((X-4)+(X-3)+(X-2)+(X-1)+(X)) / 5

Two alternatives are taken into consideration: if the values of these ratios calculated for the acquirer and the target before the announcement belong to the same interval, while keeping the difference less than 20%, then we consider that their profiles are similar. If the values do not belong to the same interval, and the difference is more than 20%, then we consider that they have different profiles.

The choice of the threshold of 20% is somewhat arbitrary,[61] but it was confirmed by a qualitative analysis based on other ratios in the balance sheet (such as the proportion of investment activities in total assets, the percentage of off-balance sheet in total assets, etc). This choice was necessary in order to get on with the business of conducting these analyses. More precise data on banks are simply not available.

Justification of the efficiency analysis method

Several techniques – parametric or non-parametric – have been proposed in the literature to measure efficiency using the frontier approaches. They mainly differ in the distributional assumptions used to disentangle inefficiency differences from random errors. The parametric Stochastic Frontier Approach (SFA) and the non-parametric Data Envelopment Analysis (DEA) are the most used tools to measure efficiency, taking into account that the literature considers both techniques as equally satisfactory.[62] We chose the DEA approach as we consider it to be a more appropriate tool in our analysis since it does not require an assumption of a functional form for the frontier relating inputs and outputs, particularly when the sample used to evaluate efficiency before and after an M&A is composed of banks of different sizes, types and countries. Also, DEA does not assume any distributional form for the inefficiency term and it is easier to accommodate multiple input and output models. And finally, the banks are directly compared against a peer or combination of peers.

The DEA approach was initially developed by Charnes, Cooper and Rhodes (1978) who proposed a model that measure technical efficiency scores under constant returns to scale (CRS). The CRS assumption has however a limited scope since it is only appropriate when operating at an optimal scale. Imperfect competition and constraints on finance may cause

[61] The same methodology has been tested in Baele et al. (2006).

[62] Weill (2004).

a Decision Making Unit (DMU) not to be operating at optimal scale. Banker, Charnes and Cooper (1984) described a revised model including variable returns to scale (VRS), thus allowing the computation of pure technical efficiency and scale efficiency. The VRS specification has been the most commonly used specification in the 1990s.

The DEA model is a linear programming-based method for evaluating the relative efficiency of a set of decision-making units (DMUs). The DEA frontier is formed as the linear combination that connects the set of 'best-practice observations' in the data set under analysis. As a consequence, the DEA efficiency score for a specific DMU is not defined by an absolute standard or 'theoretical maximum', but it is defined relative to the other DMUs in the specific data set under consideration.

DEA suffers from its limitations, however, in that it does not consider the existence of an error term (or 'noise') and it cannot be used to conduct conventional statistical tests of hypotheses in particular when testing the presence of environmental variables. In that case, it seems preferable to use the Stochastic Frontier Analysis (SFA) rather than DEA.

In this paper, we use the non-parametric DEA approach[63] to estimate cost and profit efficiency scores.[64] The frontier is obtained by means of linear combination of efficient firms contained in the sample. Although cost efficiency obtained by means of non-parametric techniques has been a widely used procedure, the estimation of profit efficiency by non-parametric techniques has rarely been done. Cost efficiency (profit efficiency) measures the distance between each bank's costs (profits) vis-à-vis the 'best practice' in the industry when producing the same bundle of outputs. Cost efficiency provides an indication of wastes in the production process and of the optimality of the chosen mix of inputs as a function of their respective prices. Profit efficiency, on the other hand, provides an indication of the optimality of the chosen mix of inputs and outputs. The comparison of cost and profit efficiency scores may give an indication of a likely market power effect.

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[63] Berger & Mester (1997) and Maudos & Pastor (2003).

[64] The efficiency of a firm consists of two components: *technical efficiency*, which reflects the ability of a firm to obtain maximal output from a given set of inputs, and *allocative efficiency*, which reflects the ability of a firm to use the inputs in optimal proportions, given their respective prices.

The non-parametric DEA model uses linear programming to find the best practice bank in the sample (*i=1,….N)* that reflects minimum costs in producing the observed output vector Q, ($y_i = y_{i1,} \ldots\ldots, y_{iq}) \in \Re^{q++}$ that sell at prices ($r_i = r_{i1,} \ldots\ldots r_{iq}$) $\in \Re^{q++}$ given the a vector of P inputs ($x_i = x_{i1}, \ldots\ldots, x_{ip}$) $\in \Re^{p++}$ for which they pay prices $(w_i = w_{i1}, \ldots\ldots w_{ip}) \in \Re^{q++}$.

The cost efficiency of each bank *j* can be computed by solving the following problem of linear programming:

$$Min \sum_p w_{pj} x_{pj}$$

$$Subject\ to \sum_i \lambda_i y_{iq} \geq y_{jq} \forall q$$

$$\sum_i \lambda_i x_{ip} \leq x_{jp} \forall p$$

$$\sum_i \lambda_i = 1, \lambda_i \geq 0, i = 1, \ldots\ldots N$$

The solution $x_j^* = x_{j1}^*, \ldots\ldots x_{jp}^*$ corresponds to the input demand vector that minimises the costs with the given price of inputs and is obtained from a linear combination of banks that produces at least as much of each of the inputs using the same or less amount of inputs, and the cost will be $C_j^* = \sum w_{pj} x_{pj}^*$ which, by definition, is less than or equal to the cost of the bank *j* ($C_j = \sum w_{pj} x_{pj}$).

The cost efficiency[65] for bank *j* (CE_j) can be calculated as follows:

$$CE_j = \frac{C_j^*}{C_j} = \frac{\sum_p w_{pj} x_{pj}^*}{\sum_p w_{pj} x_{pj}}$$

[65] On radial cost efficiency, see Banker et al. (1984).

where $CE_j \leq 1$ represents the ratio between the minimum cost C_j^* associated with the use of the input vector x_j^* that minimises the costs and the observed costs C_j for bank.

Equally, the alternative profit efficiency[66] is empirically calculated with the following linear programming formally expressed:

$$MaxR_j - \sum_p w_{pj} x_{pj}$$

Subject to

$$\sum_i \lambda_i R_i \geq R_j$$
$$\sum_i \lambda_i y_{iq} \geq y_{jq} \forall q$$
$$\sum_i \lambda_i x_{ip} \leq x_{jp} \forall p$$
$$\sum_i \lambda_i = 1; \lambda_i \geq 0; i = 1,.....N$$

The solution of the linear programming corresponds to the revenue R_j^* and input demand $x_j^* = x_{j1}^*,.....x_{jp}^*$ which maximises profits given the prices of the inputs *w*. This solution is obtained from a linear combination of firms that produce at least as much of each of the outputs using a smaller or equal quantity of inputs and obtains at least as much revenues as bank *j*.

Alternative profit efficiency is then calculated as follows:

$$APE_j = \frac{P_j}{AP_j^*} = \frac{R_j - \sum_p w_{pj} x_{pj}}{R_j^* - \sum_p w_{pj} x_{pj}^*}$$

[66] Berger & Mester (1997) and Rogers (1998).

Where APE_j represents the ratio between the observed profits ($P_j = R_j - \sum_p w_{pj} x_{pj}$) and the maximum profits $AP_j^* = R_j^* - \sum_p w_{pj} x^*_{pj}$ associated with the maximum revenue and the input demand $x_j^* = x_{j1}^*,.....x_{jp}^*$ that maximises profit for bank *j*.

In applying DEA, we adopted the intermediation approach proposed by Sealey & Lindley (1977). It assumes that the bank collects deposits to transform them, using labour and capital, into loans as opposed to the production approach which views the bank as using labour and capital to produce deposits and loans. According to the empirical literature,[67] the choice of either approach may have an impact on the level of efficiency scores but it does not imply strong modifications in their rankings.

Two outputs are included, loans and investment assets.[68] The inputs, whose prices are used to estimate cost and alternative profit frontiers, include labour, physical capital and borrowed funds.

As data on the number of employees are not available, the price of labour is measured by the ratio of personnel expenses to total assets.[69] The price of physical capital is defined as the ratio of other non-interest expenses relative to fixed assets. The price of borrowed funds is measured by the ratio of paid interest to all funding. Total costs are interest costs and non-interest costs. To measure total profit, we use operating gross income,[70] which does not include loan provisioning as provisioning rules differ from one country to another one in Europe.

Balance-sheet ratios analysis [71]

Three sets of balance-sheet ratios are examined below, including cost, profitability and risk ratios.

1. Cost ratios include a *cost to income ratio*, which permits one to examine total costs (non-interest expenses and interest expenses)

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[67] Wheelock and Wilson (1995), Berger, Leusner and Mingo (1997).

[68] This item includes the 'other earning assets' in the FitchRatings terminology, which are the earning assets other than loans.

[69] Dietsch & Weill (2001), Altunbas et al. (2001) and Maudos et al. (2002).

[70] That is, profit before provisions and taxes.

[71] Rhoades (1998).

relative to total operating revenues. This ratio reflects the ability of the bank to generate revenue from its expenditures. Furthermore, for many banks, revenues reflect income earned from the balance sheet as well from the off-balance sheet.[72]

It is also of special interest to break down total costs into *non-interest costs* (personnel expenses, back-office operations and branches, amortisation expense of intangible assets) and *interest costs* (cost of financial capital) as a share of total assets. The former should be directly affected by the cost savings that are frequently cited as a result of horizontal bank mergers. The later may be significantly affected by the way in which the bank obtains deposits. For example, a bank may choose to shift from using core deposits (predominately retail deposits) as a source of funds to using purchased money. Obtaining core deposits tends to incur high non-interest expenses from the fixed costs of running the branches and the personnel, while the opposite is true for obtaining purchased money, especially when interest rates are relatively low. The advantage of using total assets as a denominator in the cost ratios is that assets reflects the earnings base of the bank and they are not highly variable from one year to another, whereas revenues tend to be more variable.

2. The profitability ratios include the *return on assets (ROA)*, which is the ratio of gross income to average assets and the *return on equity (ROE)* which is the ratio of gross or net income to equity. The gross income[73] measure is preferable to net income[74] in order to avoid the differences in taxation between European countries. ROA is a good overall indicator of a banking organisation's performance in that it illustrates the ability of a bank to generate profits from the assets at its disposal. It has the disadvantage however of not accounting for the profits

[72] Among the large banks, derivatives are important off-balance sheet items, which may be larger as measured by notional value than total assets. For many other banks, unused commitments such as credit cards and home equity lines of credit, represent major off-balance sheet items that are sometimes larger in value than assets. Standby and commercial letters of credit represent an important although much smaller source of off-balance sheet items primarily for larger banks. Off-balance sheet activities result in expenses and also revenues.

[73] Income before taxes.

[74] Income after taxes.

generated from the off-balance sheet operations. ROE is an alternative measure of profitability designed to reflect the return to owners' investment. It has also a disadvantage in that the denominator may vary substantially across banks, even those of identical size due to the discretionary choices by management as to the mix between equity and debt capital as well as the total amount of capital held by a firm.

Finally, it is also worth decomposing total revenue into its main streams: interest and non-interest revenues to measure the diversification of income. In addition, we will measure the ability of the bank to generate revenue by the asset productivity ratio, which is based on total revenues as a share of total assets.

3. Risk indicators are used to determine the change in the risk profile of a bank after a merger or an acquisition. For example, the *capital ratio*, which is defined as equity to total assets, indicates the capital strength of the bank and its ability to absorb credit and other losses. The solvency ratio, measured by the *loan-loss provision to net interest revenue*, provides an indication of the extent to which the bank has made provisions to cover credit losses. The higher the ratio, the larger the amount of expected bad loans on the books and the higher the risks despite having been provisioned.

5.2 Data

M&A sample

The sample contained 71 completed mergers and acquisitions executed by banks headquartered in the EU15 plus Norway. The announcement dates ranged between 1 January 1996 and 1 January 2001. The deals were primarily obtained from the Thomson Financial Securities, M&A SDC database and press coverage. The period under scrutiny is of particular interest because it immediately follows the regulatory changes associated with the completion of the single market programme in the EU, and it also covers the period before and after the introduction of the euro. Since a breakdown is made between the domestic and the cross-border deals, both the single market programme and EMU are expected to be catalysts for cross-border M&A activity in banking.

All the deals included in our study are horizontal takeovers that can either be classified as complete mergers (involving the combination of the consolidating partners) or majority acquisitions exceeding the threshold of

49% of voting rights (in which the acquiring bank buys a controlling equity stake in the target bank, and both banks remain legally separate entities), in order to take into account all the operations having generated a transfer of capital control.

The targets and the acquirers are banking institutions (commercial banks, savings institutions, cooperatives banks and public credit institutions), as defined in the second banking directive. Insurance and 'securities' are excluded.

To explore the sample, statistical analysis on the number of transactions was performed.

Table A3.1 in Annex gives the number of transactions by year and country of targets; Table A3.2 displays the number of acquirers and targets per country; Table A3.3 shows the number of transactions per strategies per country and Table A3.4 shows the number of transactions per strategies and years.

The control group

The control group is composed of non-merging or majority-acquired European banking institutions that meet the same selection criteria as the M&A sample. Foreign branches and subsidiaries that have their parent institution outside the EU15 or Norway are excluded. We also excluded from our sample institutions that were involved in a merger or a majority acquisition. These banks are mainly commercial, cooperative and savings banks. We excluded subsidiaries of foreign banks, specialised financial institutions and central banks.

The number of banks of the control group by country is given in Table A3.5 in Annex 3. All the data used in the empirical analysis are derived from *Bankscope*, a FitchRatings/Bureau Van Dijk international database, which provides annual income and balance sheet data for banks.

5.3 Results

The efficiency measures are the results of the implementation of a variable returns to scale (VRS) model.[75] Precisely, we perform a dynamic efficiency

[75] In our empirical analysis, computer routines are carried out using DEAP 2.1 (Coelli, 1996).

analysis on a sample of 71 bank-to-bank mergers and acquisitions (including 11 cross-border transactions) completed over the period 1996-2000.

The construction of cost and profit frontiers was based on a large sample of approximately 587 European banks located in the same EU countries.

In addition, the control group was constituted to provide a basis for comparing performance of the merged institutions to non-merged institutions that are similar in term of size, type and location. This group excludes the pre-specified sample of 71 bank-to-bank mergers and majority acquisitions and more generally all the banks that were involved in a takeover during the same year. The period of observation is 1996-2003. We consider unconsolidated balance sheet data whenever possible.

Banking M&As and performance – Cost and profit efficiency indicators (Annex 4)

Our efficiency results indicate that banks' cost efficiency **for the domestic transactions** slightly improves following the merger or acquisition. This improvement is more pronounced for the targets as they were much less efficient than the acquiring banks prior to the transaction. In other words, targets benefit more from the transaction than acquirers.[76]

This result supports two theses: the first is a transfer of best practices of the acquiring bank to the target and the second, which is related to the first, is the existence of an efficient market for corporate control in European banks. This market would detect banks having a potential to improve their costs management. These findings suggest that M&As would be more successful in cases where the target is poorly managed in terms of costs.

The average cost-efficiency scores displayed in domestic transactions hide interesting results when applying the AG matrix.

When M&A transactions aim at focusing activities in the same local area, acquirers and targets fail to improve their cost efficiency scores. This result contradicts the cost savings related-motive put forward by managers when justifying this type of transaction.

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[76] These results are confirmed in Vander Vennet (1996), Altunbas & Ibanez (2004) and Ayadi & Pujals (2005).

These findings confirm that the potential of exploiting scale economies is limited if not non-existent in this type of transaction. This could be explained by the fact that after an M&A, the new entity has reached a critical mass beyond which any opportunity to reduce costs is exhausted. This could also be explained by the limited scope to reduce costs owing to the rigidity of the labour market[77] and the difficulties inherent to the post-integration process. Finally, this result may also be a consequence of limited opportunities to transfer best practices or a result of the manager's inability to reduce costs.

In the case where M&As aim at focusing activities in different local areas, the consolidating banks improve their cost-efficiency scores. The improvement is more pronounced for the targets. However, there seems to be a high potential for improving cost-efficiency scores for this type of transaction, where banks are operating in different local areas, since their cost-efficiency score is below the average for domestic transactions. This finding supports the hypothesis in which scale economies and transfer of best practices could be more easily exploited in this type of transactions.[78]

When M&A transactions aim at diversifying activities in the same local area, cost efficiency scores are unchanged for the targets, while a slight deterioration is experienced by the acquirers.[79] It is important to note that the cost-efficiency scores for the acquirers (and respectively the targets) in this type of transaction are substantially higher than the average cost-efficiency scores for the acquirers (and the targets) in the domestic transactions. Despite the slight reduction of cost-efficiency scores for the acquirers, the consolidating banks have succeeded in keeping the cost-efficiency level above the average. This finding would support the hypothesis that scale and scope economies could be more easily exploited in this type of transactions.

When M&A transactions aim at diversifying activities and geographical reach domestically, acquirers and targets fail to improve cost efficiency scores.[80]

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[77] Focarelli, Panetta & Salleo (2002).

[78] This result confirms the findings of Beitel et al. (2004) in Europe, DeLong (2001) and Cornett et al. (2000) in the US.

[79] This result confirms the findings of Beitel et al. (2004) in Europe, DeLong (2001) and Cornett et al. (2000) in the US.

[80] This result confirms the findings of Beitel et al. (2004) in Europe, DeLong (2001) and Cornett et al. (2000) in the US.

This finding is explained by the inability of these banks to exploit scale and scope economies, which could be a result of bad post-M&A management or all of the difficulties inherent to consolidating banks that operate in different activity segments.

In general, acquirers and targets involved in the domestic transactions are more cost-efficient than the banks of the control group before and after the M&A. Cost-efficiency scores have slightly improved for the control group. However, this improvement is below any positive change experienced by the acquirers and the targets.

With respect to profit-efficiency scores,[81] we found a positive variation for the acquiring and target banks.[82] Indeed, prior to the transaction, acquirers displayed higher scores than the targets. After the transaction, targets enjoyed more pronounced improvement in scores. This finding implies that European banks have exploited the opportunities to improve their profit efficiency either through anti-competitive pricing and/or pricing change and/or scale and scope economies and/or the advantages of a multi-specialised banking model.

The average change in the profit-efficiency scores confirms the same trend for M&A transactions focusing on activities and geography. Indeed, acquirers and targets succeeded in improving their scores. However, in this same type of transactions, cost efficiency scores dropped, this would suggest that the improvement of profit efficiency scores would be a result of an increase of revenues due to a market power manipulative effect on the local market.[83]

Similarly, when an M&A transaction has focused its activities in different areas domestically, both the acquirer and the target have improved their profit efficiency scores as compared to other transaction

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[81] These results should be interpreted with caution owing to a number of limits of the DEA methodology, particularly the non-availability of output prices.

[82] Results confirmed by Vander Vennet (1996), Altunbas & Ibanez (2004) and Ayadi & Pujals (2005) for European banks; by Houston, James & Ryngaert (2001) for US banks; and by Focarelli & Panetta (2002) for Italian banks.

[83] This type of transactions could potentially lead to a concentration increase in a given local market. The conclusions of Berger & Hannan (1998) confirmed that higher concentration would result in a price increase and thus revenue increase. Moreover, in a less competitive market, motivations to reduce costs are minimum levels are inexistent.

types and to the control group. This type of transaction improved both cost and profit efficiency scores. This finding indicates that there is a higher incentive to improve profit and cost efficiency in transactions that aim at expanding operations in different areas domestically.

However, in the transactions aiming at diversifying activities in the same local area, acquirers experienced an increase of their profit efficiency scores,[84] whereas targets experienced the opposite effect. The latter were more profit efficient than the acquirers before the transaction. In this type of transaction, acquirers benefited from revenue synergies due to the complementarity of activities. The negative evolution of the targets' efficiency scores could be explained by the problems experienced by a few banks in the sample.

In the transactions that diversify activities and geographies, targets experienced a clear improvement in their profit efficiency scores, whereas a slight deterioration occurred for the acquirers. This finding indicates that targets have markedly benefited from revenue synergies due to activities and geographies extension.

For the cross-border transactions, our cost efficiency results show a deterioration of the acquirers' scores and a slight improvement for the targets' scores.[85] It is also interesting to note that the targets involved in cross-border transactions were more efficient in terms of cost than the ones involved in domestic transactions.[86] This is an indication that the potential targets involved in the cross-border transactions are amongst the most cost efficient in the industry. For the acquirers, it is obvious that the potential of improving cost efficiency is limited due to the additional costs resulting from the difficulties in managing large and complex organisations across borders, not to mention the over-evaluation of the premium paid to the shareholders of the target.

When applying the AG matrix, cross-border transactions that concentrate activities fail to improve cost efficiency scores for the acquirers.

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[84] These findings are confirmed by Vander Vennet (1996).

[85] These findings are confirmed in Vander Vennet (2002 a and b) and Ayadi & Pujals (2005) and also in Beitel et al. (2004) for European banks and Houston & Ryngaert (1997) for US banks, who concluded that transactions focusing on geographies are more successful than the ones diversifying geographies.

[86] See previous footnote.

The deterioration of the acquirers' scores is more pronounced in the diversifying transactions' type. The targets, instead, improve their cost efficiency scores for both types of transactions. Clearly, it is easier for cross-border transactions to improve cost efficiency when banks operate in the same activities.

With respect to profit efficiency, acquirers and targets failed to improve their scores although they displayed higher scores as compared to the banks involved in domestic transactions and those of the control group.[87] The deterioration of profit efficiency scores is more pronounced for the acquirers.

When looking at focusing versus diversifying M&A transactions, both failed to improve profit efficiency scores for the acquirers. However, the deterioration is more pronounced in the focusing M&A transactions. For the targets, scores have slightly improved in the diversifying M&A transactions. This finding should not be generalised, however, since it is based on one only transaction, and given the fact that the target has displayed a low profit efficiency level as compared to the targets' average score involved in cross-border transactions.

The findings related to cross-border transactions would suggest that, despite the potential of cost and revenue synergies promised by focusing and diversifying transactions, there are still some difficulties to resolve before it can be fully realised.

These findings confirm the conclusions of the survey conducted by the European Commission in 2004 and 2005 on a sample of 355 financial institutions as mandated by the European Council in Scheveningenin in September 2004 (see Annex 1 for a summary of the results). These conclusions confirm that the most relevant impediments identified are the inadequate cross-border cost and revenue synergies. The synergies are insufficient to offset the M&A costs and fail to generate a sufficient return on investment. This lack of synergies is explained by the following factors:

- Fragmentation of retail markets, related to the difficulty of selling similar products in different domestic markets;

[87] These findings are confirmed by Vander Vennet (1996, 2002a), Altunbas & Ibanez (2004) and Ayadi & Pujals (2005).

- Divergent supervisory rules and practices, e.g. multiple reporting requirements, divergence of supervisory practices and complex supervisory approval processes;
- Legal impediments to corporate expansion and re-organisation, e.g. taxation on dividends, VAT and other forms of double taxation, employment legislation and legal structures of the companies; and
- Potential reluctance on the part of consumers or employees to accept takeovers and acquisitions from foreign companies, especially those of smaller savings or cooperative institutions.

Banking M&As and performance – balance-sheet indicators (Annex 4)

For all transactions, our results, based on the cost to income ratio (CIR), show that the acquirers are more cost efficient than the targets and the banks of the control group. After the transaction, the CIR has improved, implying a cost reduction for the acquirers and the targets. This reduction is more pronounced for the targets since they display an initial higher potential for improvement than the acquirers. It is also interesting to note that the reduction in terms of interest costs is more important than non-interest costs.

The domestic transactions succeeded in improving the CIR and in reducing total costs. This finding confirms the potential of cost savings of this type of transactions.

The average evolution of the CIR confirms that for the transactions aiming at focusing activities in the same local area, acquirers and targets have improved their CIR and reduced total costs in their total assets. This finding supports the hypothesis of the cost savings' potential of this type of transaction. Also, this improvement could be explained by a more than proportionate increase of the income (as compared to the cost reduction) due to either an increase of the activity volume resulting from the merger or acquisition or a change in pricing policy of banks after the transaction. However, the results displayed in the cost efficiency analysis are consistent with a deterioration of the acquirers' scores after the transaction. This difference is explained by the fact that the cost reduction showed by the financial indicators is insufficient to maintain or improve the cost efficiency scores. Consequently, one might think about the optimal level of cost reduction corresponding to the U-shaped cost function. Therefore, it is interesting to further explore the optimum level of cost reduction from which there would be an improvement of cost efficiency. It is important to

mention that the limits inherent to the financial indicators are such that the prices of the inputs are not taken into consideration, which is not the case for the cost efficiency analysis.

For the transactions aimed at focusing activities in different local areas, the CIR has improved, while total costs, in particular interest costs, were reduced for the acquirers and even more dramatically for the targets.[88] The reduction of non-interest costs seems more difficult to achieve for the reasons stated previously. Moreover, this could also relate to the existence of a number of savings banks and other banks in the proximity that depend strongly on the network of their branches. The results of the cost efficiency analysis confirm these conclusions.

When M&A transactions aim at diversifying activities in the same local area, the cost efficiency analysis showed that acquirers are the most efficient, despite a slight deterioration of their scores after the transaction. The results displayed by the financial indicators analysis showed that despite an improvement of the acquirers' CIR, these banks are the least efficient as measured against the average score of their counterparts in the domestic transactions. A plausible explanation would be that these banks have failed to increase their revenues while maintaining their total costs. Similarly, the fairly cost-efficient targets have seen their CIR deteriorate by more than 20% after the transaction. This is also an indication that the difficulties in generating additional revenues while maintaining the total costs experienced by the acquirers are transferred to the targets. Adding to the conclusions of the empirical research on the subject, these findings show that, while best practices could be transferred from the acquirers to the benefit of the targets after the transaction, the opposite scenario occurs when the acquirer is experiencing difficulties.

In the case of M&As creating diversified activities and geographies, acquirers improved their CIR, despite a deterioration of their cost efficiency scores. This finding indicates that these banks generate more revenues while maintaining their total costs at the same level. For the targets, the deterioration of their cost efficiency scores could be explained by their failure to control their non-interest costs; nevertheless, they succeeded improving their CIR thanks to an increase of revenues.

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[88] This could be also explained by fact that interest rates were relatively low in 1996-2000 pushing banks to seek re-financing in the inter-bank market.

Our results, which are based on ROA (return on assets) and ROE (return on equity), showed a slight improvement for the acquirers involved in the domestic transactions, which was more pronounced for the targets, while the control group showed the opposite trend. Moreover, the decrease of interest revenues was substituted by an increase of other non-interest revenues for the acquirers and the targets. Productivity deteriorated for the acquirers, targets and the control group alike. This is an indication that the productivity of assets is a general problem for European banks.

The average trend of ROA and ROE for the banks involved in domestic transactions showed that for M&As that concentrate the same activities in a single local area, both the acquirers and targets have improved their profitability. This improvement is more pronounced for the targets since they displayed more potential for improvement before the transaction. Productivity has also deteriorated for this type of transactions.

In the cases of M&As aiming at concentrating activities in different local areas, both the acquirers and targets have improved their ROA and ROE. This improvement is more pronounced for the targets due to their low profitability before the transaction. Productivity has also deteriorated after the transaction.

When M&As aim at diversifying activities in the same local area, our results show that the acquirers have slightly improved their ROA, while no improvement was registered for the targets. This finding confirms the results of the profit efficiency indicators for this type of transaction. The ROE has displayed the opposite evolution.[89] Productivity of assets has also deteriorated for this type of transaction.

When M&A transactions aim at diversifying activities and geographies domestically, acquirers and targets have both improved their profitability. The most surprising is that even the productivity has improved. These findings confirm the benefits of multi-specialised banking models. However, the profit efficiency analysis has shown a deterioration of the scores for the acquirers, which could indicate the incapacity of management to fully exploit the benefits of revenue synergies due to the X-inefficiencies.[90]

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[89] The targets of this type of transaction exhibited a low profitability level in terms of ROA and ROE.

[90] Thus, confirming the hypothesis of Leibenstein (1966).

When measuring the solvency ratio, acquirers and targets have experienced a positive change in all types of transactions. This could explain the behaviour of national prudential authorities in defending domestic transactions.

In cross-border transactions, acquirers are more cost-efficient in terms of CIR than the acquirers involved in domestic transactions, but this type of transaction has had a negative impact on the acquirers' and targets' CIR. Despite a slight reduction of total costs in the assets, these transactions do not generate sufficient revenues, compared to their expenses.

For both types of M&A (focusing and diversifying) transactions, the cost-efficiency analysis showed a deterioration of the scores for the acquirers, despite their success in reducing total costs. For the targets, the cost-efficiency analysis showed an improvement of their scores which is partly explained by the reduction of their total costs. The CIR has neither improved for the acquirers nor for the targets not only because total costs were not controlled as expected but also because they failed to generate sufficient additional revenues while maintaining the same expenses.

Our results of the profitability analysis confirm that domestic transactions are more profitable in terms of ROA and ROE than cross-border transactions, despite the high profitability level of banks involved in cross-border transactions. Indeed, cross-border transactions have failed to improve profitability, regardless of their type.

Finally, our results show the negative impact of cross-border M&As on solvency.

5.4 Conclusions

In our assessment of the performance of European banks involved in 71 M&A transactions in the period 1996-2000, we showed that the different transactions' categories, including focusing versus diversifying activities and geographies, would have different impacts on banking performance. We believe, therefore, that this would indicate that the activity-geography combination would be a factor of success or failure for these transactions.

In general, our results confirm the conclusions of previous empirical research which finds that domestic transactions have a higher chance to reduce costs, increase profits and achieve higher cost and profit efficiency.

However, M&A transactions that concentrate activities in the same local area could raise anti-competitive concerns since the improvement of profit efficiency is shown to be driven by an increase in revenues

suggestive of a pricing policy change rather than an improvement of cost efficiency. This result should be interpreted with caution, however, owing to the limitation of data collection by banking activity segment and also the unavailability of output prices.

Further, it seems that the cost-reduction potential in M&A transactions aimed at achieving multi-specialisation is limited. This result confirms that it is more difficult to reach a critical mass when a bank simultaneously runs several activities, thereby reducing the opportunities to exploit scale economies. However, this limitation would suggest the need to examine any opportunity to exploit scope economies in the cost function.

Finally, in our sample, cross-border transactions have failed to improve performance both in terms of cost and profits. These results could be clearly explicable in view of the obstacles that impede cross-border cost and revenue synergies. Therefore, to achieve an efficient, competitive and integrated European banking market, policy-makers should continue their efforts to tackle the most relevant obstacles identified by the European Commission's survey in 2005.

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ANNEX 1. THE FINDINGS OF THE EUROPEAN COMMISSION'S SURVEY ON CROSS-BORDER CONSOLIDATION IN THE EU FINANCIAL SECTOR

	Intensity	Especially relevant for:
I. Elements that lower the economic value of cross-border acquisitions	**+++**	
30. Non-overlapping fixed costs*	+++	Across the board
I.1 Difficulties in selling the same products across countries	**+++**	Smaller institutions
29. Different product mixes	+++	
21. Discriminatory tax treatments	+++	
20. Specific domestic tax breaks	+++	
15. Uncertainty on VAT regime	++	
11. Divergent consumer protection rules	++	
13. Differences in private law	+	
I.2 Implications of supervision for cross-border institutions	**++**	Large and very large institutions
27. Multiple reporting requirements	+++	
26. Divergences in supervisory practices	++	
25. Supervisory approval processes	++	
I.3 Legal impediments to corporate expansion and reorganisation	**++**	Large institutions, with cross-border M&A experience or having attempted a cross-border M&A (except for dividends taxation which was raised by all types of institutions)
22. Taxation on dividends	+++	
9. Employment legislation	++	
3. Legal structures	++	
18. Inter-group VAT	+	
16. Exit tax on capital gains	+	

II. Elements contributing to an unfavourable/disabling environment	**++**	
35. Political interference	+++	Share capital companies, large and very large institutions, with cross-border M&A experience or having attempted a cross-border M&A
39. Political concessions	+	
24. Misuse of supervisory powers	++	
4. Limits or controls on foreign participations	++	
2. Opaque decision making processes	+	
5. Defence mechanisms	+	
6. Impediments to effective control	+	
III. Consequences of individual perception of EU foreign entities	**++**	
36. Employees' reluctance	+++	Smaller institutions, cooperative and savings institutions
40. Consumer mistrust in foreign entities	++	

* The number next to each item corresponds to the numbering of the background paper that served as a reference for the online survey.

Source: European Commission (2005).

ANNEX 2. CALCULATION PROCEDURES

Table A2.1 Ratios display during the period of investigation

Ratios relative to transactions at year (X)	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
1996	**X**	X+1	X+2	X+3	X+4	X+5	X+6	X+7
1997	X-1	**X**	X+1	X+2	X+3	X+4	X+5	X+6
1998	X-2	X-1	**X**	X+1	X+2	X+3	X+4	X+5
1999	X-3	X-2	X-1	**X**	X+1	X+2	X+3	X+4
2000	X-4	X-3	X-2	X-1	**X**	X+1	X+2	X+3

Table A2.2 Calculation of ratios prior to and after the announcement of the transaction

Ratios relative to transactions at year (X)	**Before (Xb)**	**After (Xa)**	D = Xb-Xa
1996	X	((X+1)+(X+2)+(X+3)+(X+4)+(X+5)+(X+6)+(X+7))/7	D1
1997	((X-1)+(X))/2	((X+1)+(X+2)+(X+3)+(X+4)+(X+5)+(X+6))/6	D2
1998	((X-2)+(X-1)+(X))/3	((X+1)+(X+2)+(X+3)+(X+4)+(X+5))/5	D3
1999	((X-3)+(X-2)+(X-1)+(X))/4	((X+1)+(X+2)+(X+3)+(X+4))/4	D4
2000	((X-4)+(X-3)+(X-2)+(X-1)+(X))/5	((X+1)+(X+2)+(X+3))/3	D5

Source: Author calculations.

ANNEX 3. BACKGROUND DATA ON M&A SAMPLE

Table A3.1 Number of transactions by year and country of target

Country	1996	1997	1998	1999	2000	Total	%
Portugal	1	2	1	1	1	**6**	8%
Denmark	0	0	1	1	1	**3**	4%
Finland	0	1	0	0	0	**1**	1%
Sweden	2	0	0	0	0	**2**	3%
Spain	0	6	5	5	1	**17**	24%
Germany	0	2	2	1	0	**5**	7%
France	3	4	1	3	1	**12**	17%
Italy	0	7	10	5	3	**25**	35%
Total	**6**	**22**	**20**	**16**	**7**	**71**	100%
%	8%	31%	28%	23%	10%	100%	

Table A3.2 Acquirers and targets by country

Country	Acquirers	Targets	Total
Portugal	6	8	14
Denmark	2	3	5
Finland	1	1	2
Sweden	3	2	5
Spain	10	15	25
Germany	5	4	9
Austria	0	1	1
France	10	12	22
Italy	19	25	44
Luxembourg	1	0	1
Total	57	71	128

Table A3.3 The number of transactions per strategy per country

Country	S1	S2	S3	S4	S5	S6	Total
Portugal	2	3	0	1	0	0	6
Denmark	0	0	2	0	1	0	3
Finland	0	0	0	0	1	0	1
Sweden	1	0	1	0	0	0	2
Spain	1	10	0	0	5	1	17
Germany	1	0	1	1	2	0	5
France	6	2	2	1	0	1	12
Italy	5	18	1	1	0	0	25
Total	16	33	7	4	9	2	71
%	23%	46%	10%	6%	13%	3%	100%

Table A3.4 Transactions by strategy and year

Strategy	1996	1997	1998	1999	2000	Total	%
S1	2	9	3	1	1	16	23%
S2	0	8	12	8	5	33	46%
S3	2	0	2	2	1	7	10%
S4	1	1	1	1	0	4	6%
S5	0	3	2	4	0	9	13%
S6	1	1	0	0	0	2	3%
Total	6	22	20	16	7	71	100%

Table A3.5 Control group by country

Country	Total
Austria	38
Belgium	22
Denmark	26
Finland	3
France	106
Germany	126
Greece	7
Italy	131
Netherlands	20
Portugal	10
Spain	29
Sweden	9
UK	42
Norway	18
Total	587

ANNEX 4. RESULTS – EFFICIENCY ANALYSIS

a) Cost and profit efficiency indicators

Cost efficiency indicators								
		Acquirers			Control group			
Transaction type		**Before (1)**	**After (2)**	**Difference (A=(2)-(1))**	**Before (1)**	**After (2)**	**Difference (B=(2)-(1))**	**Difference (A) - (B)**
Total	63	67.39%	66.61%	**-0.78%**	36.69%	39.90%	**3.21%**	**-3.99%**
National	54	65.89%	66.15%	**0.27%**	36.72%	39.89%	**3.17%**	**-2.90%**
Cross-border	9	78.20%	69.88%	**-8.32%**	36.60%	39.88%	**3.27%**	**-11.59%**
S1	14	78.15%	75.77%	**-2.37%**	36.92%	39.46%	**2.54%**	**-4.92%**
S2	31	58.27%	62.06%	**3.79%**	36.62%	40.04%	**3.42%**	**0.37%**
S3	5	81.99%	81.77%	**-0.22%**	36.36%	40.56%	**4.20%**	**-4.42%**
S4	4	57.86%	43.51%	**-14.36%**	37.09%	39.60%	**2.51%**	**-16.87%**
S5	8	76.42%	69.37%	**-7.04%**	36.53%	39.99%	**3.46%**	**-10.50%**
S6	1	92.50%	73.93%	**-18.57%**	37.19%	38.99%	**1.79%**	**-20.36%**

Cost efficiency indicators								
		Targets			Control group			
Transaction type	**Number**	**Before (1)**	**After (2)**	**Difference (A=(2)-(1))**	**Before (1)**	**After (2)**	**Difference (B=(2)-(1))**	**Difference (A) - (B)**
Total	65	50.94%	55.72%	**4.78%**	36.65%	39.94%	**3.29%**	**1.49%**
National	55	51.02%	57.78%	**6.76%**	36.67%	39.93%	**3.25%**	**3.51%**
Cross-border	10	50.49%	54.99%	**4.50%**	36.54%	40.00%	**3.45%**	**1.05%**
S1	14	68.88%	69.68%	**0.80%**	36.92%	39.46%	**2.54%**	**-1.74%**
S2	33	41.99%	53.38%	**11.39%**	36.58%	40.10%	**3.52%**	**7.87%**
S3	4	69.34%	69.33%	**-0.01%**	36.17%	40.46%	**4.29%**	**-4.30%**
S4	4	44.69%	40.85%	**-3.84%**	37.09%	39.60%	**2.51%**	**-6.35%**
S5	9	52.52%	57.28%	**4.76%**	36.47%	40.11%	**3.64%**	**1.12%**
S6	1	32.20%	34.43%	**2.23%**	37.19%	38.99%	**1.79%**	**0.44%**

		Profit efficiency indicators						
		Acquirers			Control group			
Transaction type	**Number**	**Before (1)**	**After (2)**	**Difference (A=(2)-(1))**	**Before (1)**	**After (2)**	**Difference (B=(2)-(1))**	**Difference (A) - (B)**
Total	63	33.19%	40.19%	**7.00%**	10.16%	16.22%	**6.06%**	**0.93%**
National	54	28.94%	39.07%	**10.13%**	10.19%	16.21%	**6.03%**	**4.10%**
Cross-border	9	55.95%	44.22%	**-11.73%**	10.12%	16.07%	**5.95%**	**-17.68%**
S1	14	37.95%	44.27%	**6.32%**	10.67%	15.38%	**4.71%**	**1.61%**
S2	31	27.32%	40.30%	**12.98%**	10.00%	16.57%	**6.57%**	**6.41%**
S3	5	21.85%	34.19%	**12.34%**	9.47%	17.57%	**8.11%**	**4.23%**
S4	4	25.06%	23.56%	**-1.50%**	10.51%	15.12%	**4.61%**	**-6.11%**
S5	8	58.70%	46.92%	**-11.77%**	9.98%	16.28%	**6.30%**	**-18.07%**
S6	1	34.00%	22.63%	**-11.37%**	11.28%	14.41%	**3.13%**	**-14.49%**

	Profit efficiency indicators							
		Targets			Control group			Difference (A) - (B)
	Number	**Before (1)**	**After (2)**	**Difference (A=(2)-(1))**	**Before (1)**	**After (2)**	**Difference (B=(2)-(1))**	
Total	65	19.75%	30.72%	**10.97%**	10.10%	16.27%	**6.17%**	**4.80%**
National	55	18.94%	32.47%	**13.53%**	10.12%	16.27%	**6.15%**	**7.38%**
Cross-border	10	24.20%	22.76%	**-1.44%**	10.01%	16.29%	**6.28%**	**-7.72%**
S1	14	26.82%	40.75%	**13.94%**	10.67%	15.38%	**4.71%**	**9.22%**
S2	33	13.12%	30.60%	**17.48%**	9.94%	16.67%	**6.73%**	**10.74%**
S3	4	46.23%	30.59%	**-15.64%**	9.25%	17.18%	**7.93%**	**-23.56%**
S4	4	12.13%	20.86%	**8.74%**	10.51%	15.12%	**4.61%**	**4.13%**
S5	9	26.50%	24.81%	**-1.69%**	9.87%	16.50%	**6.63%**	**-8.32%**
S6	1	3.50%	4.33%	**0.83%**	11.28%	14.41%	**3.13%**	**-2.29%**

Cost income ratio (CIR)								
		Acquirers			Control group			
Transactions	Number	Before (1)	After (2)	Difference (A=(2)-(1))	Before (1)	After (2)	Difference (B=(2)-(1))	Difference A - B
Total	**71**	63.37%	60.30%	-3.06%	63.96%	66.66%	2.71%	**-5.77%**
National	**60**	64.59%	60.30%	-4.29%	63.95%	66.66%	2.72%	**-7.01%**
Cross-border	**11**	56.72%	60.36%	3.64%	63.99%	66.65%	2.66%	**0.98%**
S1	**16**	64.18%	60.43%	-3.75%	63.96%	65.69%	1.74%	**-5.48%**
S2	**33**	62.81%	58.20%	-4.61%	63.94%	67.12%	3.18%	**-7.79%**
S3	**7**	71.40%	70.18%	-1.22%	63.99%	66.99%	3.00%	**-4.22%**
S4	**4**	68.94%	59.77%	-9.18%	63.93%	66.23%	2.30%	**-11.47%**
S5	**9**	57.28%	61.09%	3.81%	63.99%	67.07%	3.08%	**0.72%**
S6	**2**	54.18%	57.06%	2.88%	64.02%	64.75%	0.74%	**2.15%**
		Targets			Control group			
	Number	Before (1)	After (2)	Difference (A=(2)-(1))	Before (1)	After (2)	Difference (B=(2)-(1))	Difference A - B
Total	**69**	73.08%	70.05%	-3.02%	63.95%	66.63%	2.67%	**-5.70%**
National	**59**	72.81%	68.30%	-4.51%	63.94%	66.62%	2.68%	**-7.19%**
Cross-border	**10**	74.63%	80.38%	5.75%	64.05%	66.66%	2.62%	**3.13%**
S1	**16**	69.22%	65.06%	-4.17%	63.96%	65.69%	1.74%	**-5.90%**
S2	**33**	78.10%	68.46%	-9.63%	63.94%	67.12%	3.18%	**-12.81%**
S3	**7**	45.53%	65.85%	20.32%	54.77%	57.12%	2.34%	**17.98%**
S4	**4**	73.10%	67.14%	-5.97%	63.93%	66.23%	2.30%	**-8.26%**
S5	**8**	76.07%	82.55%	6.48%	64.05%	67.14%	3.09%	**3.39%**
S6	**2**	68.86%	71.68%	2.82%	64.02%	64.75%	0.74%	**2.09%**

Results- Balance-sheet indicators

				Non-interest costs/Total assets				
			Acquirers			Control group		
	Number	Before (1)	After (2)	Difference (A=(2)-(1))	Before (1)	After (2)	Difference (B=(2)-(1))	Difference A - B
Total	**71**	2.24%	2.05%	-0.19%	1.59%	1.59%	0.00%	**-0.18%**
National	**60**	2.16%	2.06%	-0.10%	1.59%	1.59%	0.00%	**-0.10%**
Cross-border	**11**	2.63%	2.00%	-0.62%	1.60%	1.59%	-0.01%	**-0.61%**
S1	**16**	2.01%	1.82%	-0.19%	1.61%	1.56%	-0.05%	**-0.14%**
S2	**33**	2.52%	2.45%	-0.06%	1.58%	1.60%	0.02%	**-0.08%**
S3	**7**	1.10%	0.99%	-0.11%	1.58%	1.60%	0.02%	**-0.13%**
S4	**4**	1.71%	1.62%	-0.09%	1.60%	1.58%	-0.02%	**-0.07%**
S5	**9**	2.39%	2.04%	-0.35%	1.59%	1.60%	0.01%	**-0.36%**
S6	**2**	3.68%	1.82%	-1.85%	1.62%	1.53%	-0.09%	**-1.76%**
			Targets			Control group		
	Number	Before (1)	After (2)	Difference (A=(2)-(1))	Before (1)	After (2)	Difference (B=(2)-(1))	Difference A - B
Total	**71**	3.16%	2.71%	-0.45%	1.57%	1.56%	0.00%	**-0.45%**
National	**60**	3.24%	2.87%	-0.37%	1.56%	1.56%	0.00%	**-0.37%**
Cross-border	**11**	2.75%	1.86%	-0.89%	1.60%	1.59%	-0.01%	**-0.88%**
S1	**16**	2.44%	1.68%	-0.75%	1.61%	1.56%	-0.05%	**-0.70%**
S2	**33**	3.29%	3.19%	-0.10%	1.54%	1.55%	0.02%	**-0.11%**
S3	**7**	5.55%	4.14%	-1.41%	1.58%	1.60%	0.02%	**-1.43%**
S4	**4**	1.97%	2.67%	0.70%	1.60%	1.58%	-0.02%	**0.72%**
S5	**9**	2.82%	1.91%	-0.91%	1.59%	1.60%	0.01%	**-0.92%**
S6	**2**	2.45%	1.64%	-0.81%	1.62%	1.53%	-0.09%	**-0.72%**

Interest costs/Total assets								
		Acquirers			Control group			
Transactions	**Number**	**Before (1)**	**After (2)**	**Difference (A=(2)-(1))**	**Before (1)**	**After (2)**	**Difference (B=(2)-(1))**	**Difference A - B**
Total	**71**	4.30%	3.22%	-1.08%	3.94%	3.48%	-0.46%	**-0.62%**
National	**60**	4.25%	3.12%	-1.13%	3.94%	3.48%	-0.46%	**-0.67%**
Cross-border	**11**	4.55%	3.75%	-0.80%	3.98%	3.53%	-0.45%	**-0.35%**
S1	**16**	4.35%	3.59%	-0.76%	4.00%	3.54%	-0.46%	**-0.30%**
S2	**33**	4.09%	2.64%	-1.46%	3.90%	3.44%	-0.46%	**-1.00%**
S3	**7**	4.45%	3.56%	-0.89%	3.91%	3.45%	-0.46%	**-0.42%**
S4	**4**	4.88%	4.54%	-0.35%	3.99%	3.54%	-0.45%	**0.10%**
S5	**9**	4.19%	3.23%	-0.95%	3.96%	3.51%	-0.45%	**-0.50%**
S6	**2**	6.18%	6.07%	-0.10%	4.07%	3.61%	-0.46%	**0.36%**
		Targets			**Control group**			
	Number	**Before (1)**	**After (2)**	**Difference (A=(2)-(1))**	**Before (1)**	**After (2)**	**Difference (B=(2)-(1))**	**Difference A - B**
Total	**68**	4.68%	3.20%	-1.48%	3.94%	3.48%	-0.46%	**-1.02%**
National	**59**	4.73%	3.24%	-1.49%	3.94%	3.48%	-0.46%	**-1.03%**
Cross-border	**9**	4.39%	2.97%	-1.42%	3.98%	3.53%	-0.45%	**-0.97%**
S1	**16**	5.58%	3.84%	-1.74%	4.00%	3.54%	-0.46%	**-1.28%**
S2	**33**	4.14%	2.57%	-1.57%	3.90%	3.44%	-0.46%	**-1.11%**
S3	**6**	4.99%	4.73%	-0.26%	3.91%	3.45%	-0.46%	**0.20%**
S4	**4**	5.78%	3.81%	-1.97%	3.99%	3.54%	-0.45%	**-1.52%**
S5	**8**	3.91%	2.96%	-0.95%	3.96%	3.51%	-0.45%	**-0.50%**
S6	**1**	6.55%	3.02%	-3.53%	4.07%	3.61%	-0.46%	**-3.07%**

				ROA				
			Acquirers			Control group		
	Number	Before (1)	After (2)	Difference (A=(2)-(1))	Before (1)	After (2)	Difference (B=(2)-(1))	Difference A - B
Total	**71**	0.95%	0.99%	0.05%	0.73%	0.69%	-0.04%	**0.09%**
National	**60**	0.95%	1.03%	0.08%	0.73%	0.69%	-0.04%	**0.13%**
Cross-border	**11**	0.95%	0.79%	-0.16%	0.73%	0.70%	-0.03%	**-0.13%**
S1	**16**	0.85%	0.97%	0.13%	0.73%	0.73%	0.00%	**0.12%**
S2	**33**	1.12%	1.16%	0.04%	0.73%	0.67%	-0.06%	**0.10%**
S3	**7**	0.63%	0.72%	0.09%	0.73%	0.67%	-0.07%	**0.16%**
S4	**4**	0.49%	0.77%	0.27%	0.73%	0.71%	-0.02%	**0.29%**
S5	**9**	1.03%	0.83%	-0.20%	0.73%	0.69%	-0.05%	**-0.15%**
S6	**2**	0.57%	0.59%	0.02%	0.72%	0.76%	0.03%	**-0.02%**
			Targets			Control group		
	Number	Before (1)	After (2)	Difference (A=(2)-(1))	Before (1)	After (2)	Difference (B=(2)-(1))	Difference A - B
Total	**71**	0.77%	1.04%	0.27%	0.73%	0.69%	-0.04%	**0.31%**
National	**60**	0.58%	0.91%	0.33%	0.73%	0.69%	-0.04%	**0.37%**
Cross-border	**11**	1.81%	1.73%	-0.08%	0.73%	0.70%	-0.03%	**-0.05%**
S1	**16**	-0.18%	0.86%	1.03%	0.73%	0.73%	0.00%	**1.03%**
S2	**33**	0.77%	1.02%	0.24%	0.73%	0.67%	-0.06%	**0.30%**
S3	**7**	1.52%	0.63%	-0.89%	0.73%	0.67%	-0.07%	**-0.82%**
S4	**4**	0.41%	0.78%	0.37%	0.73%	0.71%	-0.02%	**0.39%**
S5	**9**	2.06%	1.99%	-0.07%	0.73%	0.69%	-0.05%	**-0.02%**
S6	**2**	0.72%	0.58%	-0.14%	0.72%	0.76%	0.03%	**-0.17%**

ROE								
		Acquirers			Control group			
	Number	Before (1)	After (2)	Difference (A=(2)-(1))	Before (1)	After (2)	Difference (B=(2)-(1))	Difference A - B
Total	**71**	13.43%	14.14%	0.71%	13.83%	13.34%	-0.27%	**0.98%**
National	**60**	12.53%	13.66%	1.12%	13.84%	13.32%	-0.26%	**1.38%**
Cross-border	**11**	18.33%	16.78%	-1.54%	13.80%	13.47%	-0.33%	**-1.22%**
S1	**16**	10.06%	13.57%	3.51%	13.69%	14.12%	0.43%	**3.08%**
S2	**33**	13.96%	14.25%	0.29%	13.91%	12.98%	-0.93%	**1.21%**
S3	**7**	13.33%	11.49%	-1.84%	13.91%	12.84%	1.22%	**-3.06%**
S4	**4**	9.20%	12.88%	3.69%	13.76%	13.69%	-0.06%	**3.75%**
S5	**9**	18.38%	16.98%	-1.41%	13.85%	13.21%	-0.64%	**-0.76%**
S6	**2**	18.08%	15.91%	-2.16%	13.56%	14.65%	1.09%	**-3.25%**
		Targets			Control group			
	Number	Before (1)	After (2)	Difference (A=(2)-(1))	Before (1)	After (2)	Difference (B=(2)-(1))	Difference A - B
Total	**71**	3.79%	10.30%	6.51%	13.83%	13.34%	-0.27%	**6.78%**
National	**60**	2.85%	10.97%	8.12%	13.84%	13.32%	-0.26%	**8.38%**
Cross-border	**11**	8.92%	6.66%	-2.26%	13.80%	13.47%	-0.33%	**-1.93%**
S1	**16**	1.97%	11.93%	9.96%	13.69%	14.12%	0.43%	**9.54%**
S2	**33**	6.92%	10.94%	4.02%	13.91%	12.98%	-0.93%	**4.95%**
S3	**7**	-14.76%	8.25%	23.01%	13.91%	12.84%	1.22%	**21.79%**
S4	**4**	3.60%	12.12%	8.52%	13.76%	13.69%	-0.06%	**8.58%**
S5	**9**	8.10%	4.64%	-3.45%	13.85%	13.21%	-0.64%	**-2.81%**
S6	**2**	12.65%	15.76%	3.11%	13.56%	14.65%	1.09%	**2.02%**

		Interest revenue/Total revenue						
		Acquirers			Control group			
	Number	Before (1)	After (2)	Difference (A=(2)-(1))	Before (1)	After (2)	Difference (B=(2)-(1))	Difference A - B
Total	**71**	69.72%	63.79%	-5.93%	83.10%	77.64%	-5.46%	**-0.46%**
National	**60**	69.30%	63.92%	-5.38%	83.06%	77.61%	-5.45%	**0.07%**
Cross-border	**11**	72.00%	63.07%	-8.93%	83.34%	77.79%	-5.55%	**-3.38%**
S1	**16**	73.24%	67.26%	-5.99%	83.65%	78.41%	-5.24%	**-0.75%**
S2	**33**	69.86%	64.18%	-5.68%	82.78%	77.16%	-5.62%	**-0.06%**
S3	**7**	54.99%	54.33%	-0.66%	82.82%	77.62%	-5.20%	**4.54%**
S4	**4**	73.92%	65.25%	-8.67%	83.47%	78.22%	-5.26%	**-3.41%**
S5	**9**	73.13%	62.09%	-11.04%	83.15%	77.38%	-5.77%	**-5.27%**
S6	**2**	66.93%	67.49%	0.56%	84.21%	79.65%	-4.56%	**5.12%**
		Targets			**Control group**			
	Number	**Before (1)**	**After (2)**	**Difference (A=(2)-(1))**	**Before (1)**	**After (2)**	**Difference (B=(2)-(1))**	**Difference A - B**
Total	**71**	72.25%	65.93%	-6.32%	83.10%	77.64%	-5.46%	**-0.85%**
National	**60**	72.38%	66.63%	-5.75%	83.06%	77.61%	-5.45%	**-0.30%**
Cross-border	**11**	71.54%	62.14%	-9.40%	83.34%	77.79%	-5.55%	**-3.85%**
S1	**16**	73.15%	68.24%	-4.92%	83.65%	78.41%	-5.24%	**0.32%**
S2	**33**	69.69%	65.04%	-4.65%	82.78%	77.16%	-5.62%	**0.97%**
S3	**7**	77.31%	69.75%	-7.57%	82.82%	77.62%	-5.20%	**-2.37%**
S4	**4**	82.84%	67.87%	-14.96%	83.47%	78.22%	-5.26%	**-9.71%**
S5	**9**	75.51%	66.51%	-9.00%	83.15%	77.38%	-5.77%	**-3.23%**
S6	**2**	53.69%	42.48%	-11.21%	84.21%	79.65%	-4.56%	**-6.65%**

		Non-interest revenue/Total revenue						
		Acquirers			Control group			
	Number	Before (1)	After (2)	Difference (A=(2)-(1))	Before (1)	After (2)	Difference (B=(2)-(1))	Difference A - B
Total	**71**	29.28%	35.00%	5.72%	16.88%	22.34%	5.46%	**0.26%**
National	**60**	29.51%	34.65%	5.13%	16.92%	22.36%	5.44%	**-0.31%**
Cross-border	**11**	28.00%	36.93%	8.93%	16.66%	22.21%	5.55%	**3.38%**
S1	**16**	26.76%	32.74%	5.99%	16.35%	21.59%	5.24%	**0.75%**
S2	**33**	30.14%	35.82%	5.68%	17.19%	22.80%	5.61%	**0.07%**
S3	**7**	34.83%	33.38%	-1.45%	17.18%	22.38%	5.20%	**-6.65%**
S4	**4**	26.08%	34.75%	8.67%	16.53%	21.78%	5.26%	**3.41%**
S5	**9**	26.87%	37.91%	11.04%	16.85%	22.62%	5.77%	**5.27%**
S6	**2**	33.07%	32.51%	-0.56%	15.79%	20.35%	4.56%	**-5.12%**
		Targets			Control group			
	Number	Before (1)	After (2)	Difference (A=(2)-(1))	Before (1)	After (2)	Difference (B=(2)-(1))	Difference A - B
Total	**71**	27.75%	34.07%	6.32%	16.88%	22.34%	5.46%	**0.86%**
National	**60**	27.62%	33.37%	5.75%	16.92%	22.36%	5.44%	**0.31%**
Cross-border	**11**	28.46%	37.86%	9.40%	16.66%	22.21%	5.55%	**3.85%**
S1	**16**	26.85%	31.76%	4.92%	16.35%	21.59%	5.24%	**-0.32%**
S2	**33**	30.31%	34.96%	4.65%	17.19%	22.80%	5.61%	**-0.95%**
S3	**7**	22.69%	30.25%	7.57%	17.18%	22.38%	5.20%	**2.37%**
S4	**4**	17.16%	32.13%	14.96%	16.53%	21.78%	5.26%	**9.71%**
S5	**9**	24.49%	33.49%	9.00%	16.85%	22.62%	5.77%	**3.23%**
S6	**2**	46.31%	57.52%	11.21%	15.79%	20.35%	4.56%	**6.65%**

Total revenue/Total Assets								
		Acquirers			Control group			
Transactions	**Number**	**Before (1)**	**After (2)**	**Difference (A=(2)-(1))**	**Before (1)**	**After (2)**	**Difference (B=(2)-(1))**	**Difference A - B**
Total	**71**	7.37%	6.12%	-1.25%	6.49%	5.89%	-0.60%	**-0.65%**
National	**60**	7.36%	5.95%	-1.41%	6.48%	5.88%	-0.60%	**-0.81%**
Cross-border	**11**	7.43%	7.04%	-0.39%	6.54%	5.94%	-0.60%	**0.21%**
S1	**16**	7.44%	5.92%	-1.51%	6.58%	5.97%	-0.61%	**-0.90%**
S2	**33**	7.51%	5.68%	-1.84%	6.44%	5.84%	-0.59%	**-1.24%**
S3	**7**	6.06%	5.22%	-0.85%	6.45%	5.85%	-0.60%	**-0.25%**
S4	**4**	8.03%	9.60%	1.57%	6.55%	5.96%	-0.59%	**2.16%**
S5	**9**	7.39%	6.94%	-0.45%	6.51%	5.92%	-0.59%	**0.13%**
S6	**2**	7.63%	7.53%	-0.10%	6.67%	6.05%	-0.62%	**0.52%**
		Targets			**Control group**			
	Number	**Before (1)**	**After (2)**	**Difference (A=(2)-(1))**	**Before (1)**	**After (2)**	**Difference (B=(2)-(1))**	**Difference A - B**
Total	**71**	8.25%	6.85%	-1.40%	6.49%	5.89%	-0.60%	**-0.81%**
National	**60**	8.40%	7.15%	-1.25%	6.48%	5.88%	-0.60%	**-0.65%**
Cross-border	**11**	7.44%	5.18%	-2.26%	6.54%	5.94%	-0.60%	**-1.66%**
S1	**16**	8.60%	5.91%	-2.69%	6.58%	5.97%	-0.61%	**-2.08%**
S2	**33**	8.32%	7.60%	-0.72%	6.44%	5.84%	-0.59%	**-0.12%**
S3	**7**	8.13%	7.20%	-0.94%	6.45%	5.85%	-0.60%	**-0.34%**
S4	**4**	8.79%	8.40%	-0.40%	6.55%	5.96%	-0.59%	**0.20%**
S5	**9**	6.97%	5.25%	-1.71%	6.51%	5.92%	-0.59%	**-1.12%**
S6	**2**	9.57%	4.85%	-4.72%	6.67%	6.05%	-0.62%	**-4.09%**

Capital Ratio								
		Acquirers			Control group			
Transactions	**Number**	**Before (1)**	**After (2)**	**Difference (A=(2)-(1))**	**Before (1)**	**After (2)**	**Difference (B=(2)-(1))**	**Difference A - B**
Total	**71**	7.12%	8.46%	1.33%	5.28%	5.18%	-0.11%	**1.44%**
National	**60**	7.47%	9.06%	1.58%	5.28%	5.18%	-0.10%	**1.69%**
Cross-border	**11**	5.22%	5.19%	-0.03%	5.29%	5.18%	-0.11%	**0.08%**
S1	**16**	6.88%	10.39%	3.51%	5.30%	5.16%	-0.13%	**3.64%**
S2	**33**	8.45%	9.58%	1.13%	5.27%	5.18%	-0.09%	**1.22%**
S3	**7**	5.34%	5.24%	-0.10%	5.27%	5.18%	-0.09%	**0.00%**
S4	**4**	5.55%	6.12%	0.57%	5.30%	5.18%	-0.12%	**0.69%**
S5	**9**	5.60%	5.61%	0.01%	5.29%	5.19%	-0.10%	**0.11%**
S6	**2**	3.49%	3.26%	-0.22%	5.32%	5.16%	-0.16%	**-0.06%**
		Targets			**Control group**			
Transactions	**Number**	**Before (1)**	**After (2)**	**Difference (A=(2)-(1))**	**Before (1)**	**After (2)**	**Difference (B=(2)-(1))**	**Difference A - B**
Total	**71**	9.80%	8.96%	-0.84%	5.28%	5.18%	-0.11%	**-0.74%**
National	**60**	9.07%	8.23%	-0.84%	5.28%	5.18%	-0.10%	**-0.73%**
Cross-border	**11**	13.78%	12.93%	-0.85%	5.29%	5.18%	-0.11%	**-0.74%**
S1	**16**	7.90%	8.78%	0.88%	5.30%	5.16%	-0.13%	**1.01%**
S2	**33**	8.01%	8.74%	0.73%	5.27%	5.18%	-0.09%	**0.82%**
S3	**7**	17.27%	5.44%	-11.84%	5.27%	5.18%	-0.09%	**-11.75%**
S4	**4**	8.10%	6.70%	-1.40%	5.30%	5.18%	-0.12%	**-1.28%**
S5	**9**	15.30%	14.85%	-0.45%	5.29%	5.19%	-0.10%	**-0.35%**
S6	**2**	6.92%	4.25%	-2.66%	5.32%	5.16%	-0.16%	**-2.51%**

Solvency Ratio								
		Acquirers			Control group			
Transactions	**Number**	**Before (1)**	**After (2)**	**Difference (A=(2)-(1))**	**Before (1)**	**After (2)**	**Difference (B=(2)-(1))**	**Difference A - B**
Total	**71**	17.71%	13.11%	-4.60%	15.03%	16.57%	1.54%	**-6.14%**
National	**60**	18.55%	12.73%	-5.82%	15.02%	16.58%	1.56%	**-7.38%**
Cross-border	**11**	13.13%	15.19%	2.06%	15.06%	16.49%	1.43%	**0.62%**
S1	**16**	28.53%	16.81%	-11.72%	14.77%	15.63%	0.87%	**-12.58%**
S2	**33**	16.38%	14.88%	-1.50%	15.12%	16.96%	1.84%	**-3.34%**
S3	**7**	12.53%	9.19%	-3.34%	15.13%	17.23%	2.10%	**-5.44%**
S4	**4**	7.09%	-15.07%	-22.16%	14.96%	16.12%	1.16%	**-23.32%**
S5	**9**	13.53%	14.80%	1.27%	15.17%	16.80%	1.63%	**-0.36%**
S6	**2**	11.34%	16.94%	5.60%	14.57%	15.12%	0.56%	**5.04%**
		Targets			**Control group**			
	Number	**Before (1)**	**After (2)**	**Difference (A=(2)-(1))**	**Before (1)**	**After (2)**	**Difference (B=(2)-(1))**	**Difference A - B**
Total	**71**	22.19%	17.91%	-4.29%	15.03%	16.54%	1.51%	**-5.80%**
National	**50**	22.74%	16.89%	-5.85%	15.01%	16.50%	1.49%	**-7.34%**
Cross-border	**11**	18.63%	24.58%	5.95%	15.13%	16.77%	1.64%	**4.31%**
S1	**16**	36.38%	22.62%	-13.76%	14.77%	15.63%	0.87%	**-14.62%**
S2	**33**	12.54%	13.55%	1.01%	15.12%	16.96%	1.84%	**-0.82%**
S3	**7**	38.26%	18.28%	-19.98%	15.09%	16.55%	1.46%	**-21.44%**
S4	**4**	29.00%	19.35%	-9.65%	14.96%	16.12%	1.16%	**-10.81%**
S5	**9**	17.94%	26.02%	8.08%	15.20%	17.01%	1.81%	**6.26%**
S6	**2**	24.15%	13.11%	-11.03%	14.57%	14.83%	0.27%	**-11.30%**