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Bank M&A: drivers and implications for bank performance
Cross-Borders transactions versus enforcement policy

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Abstract

This study aims to identify the common characteristics that result in mergers and acquisitions in banking institutions in Central and Eastern Europe and the Americas. The study will examine factors such as profitability, lending activities, liquidity, bank concentration, stability of the banking system, government effectiveness, regulatory quality, bank size, and inflation rate that affect the decision to merge. The study will also investigate the benefits of mergers and acquisitions during banking crises versus non-crisis periods and the position of National versus Cross-Border banks. The study will compare the legal approaches of the EU and the US with a focus on Italy under the review of the antitrust department. The study finds that cross-border mergers and acquisitions have played a vital role in bank internationalization and have a positive impact on banks' participation in the process, but can also raise competition law concerns. The study concludes that consolidation appears to have had a moderately positive impact on the profitability of banks involved, but with significant execution and design risks.

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Introduction

The aim of this study is to investigate and identify the shared characteristics that result in mergers and acquisitions among all banking institutions in Central and Eastern Europe and the Americas. We will examine the banks that are likely to be acquired versus those that are likely to acquire, and if geography plays a role in this process. We will also look into the National banks versus Cross-Border bank's position. Furthermore, we will document the key factors that affect the decision to merge, such as profitability, lending activities, liquidity, bank concentration, banking system stability, government effectiveness, regulatory quality, bank size, and inflation rate (Alin Marius Andrieş). We are investigating whether the benefits are more substantial for banks that partake in mergers and acquisitions (M&A) during banking crises than non-crisis periods. Studies have provided evidence that banks with higher capital levels, stable funding, and robust risk management have had a better performance during past crises. Furthermore, it is suggested that increased regulation is necessary for banks that experience large increases in stock market value. Mergers and acquisitions involving banks, or more specifically, insured depository institutions (IDI) are becoming more common. Cross-border mergers and acquisitions have played an increasingly vital role in the process of bank internationalization. A higher effective average tax rate, associated with decreased tax evasion, has a positive impact on banks' participation in the MA process, which holds true for both targeted banks and domestic transactions. Additionally, the study sheds light on how the financial crisis has influenced investors' behavior. MA's are one of many methods of external growth in the EU, other strategies include trade agreements, conventions, and cooperation. Cooperation among commercial banks in the European Union is justified by increased profits and profitability. Furthermore, the purpose of this paper is to compare the legal approaches of the EU area (with a specific focus on Italy) and the US under the review of the antitrust department. Cross-border MA is a complex legal transaction that involves multiple pieces of legislation. In Directive 2005/56/EC, the European Union established the Directive for cross-border mergers of limited liability companies. This regulation establishes general principles for the execution of cross-border mergers. It stipulates that each company

involved in the merger must abide by its own national merger rules and laws. However, the regulator acknowledges the possibility for national authorities to impede or block mergers. For instance, Italy, while implementing the Directive, allows national authorities, such as the Bank of Italy, to prevent mergers that impact their supervised entities. Cross-border mergers raise similar concerns with regard to competition law as acquisitions do. In the securities regulation field, a merger may necessitate an increase in capital for a listed company and the delisting of the absorbed company. There are other factors to consider such as worker participation and protection regulations and tax laws. This highlights the complexity of cross-border mergers, particularly those involving financial institutions. It's also important to take into account that these transactions can be quite costly. In the case of mergers involving credit institutions of different types (heterogeneous mergers), there are additional complexities as it leads to a fundamental change in the structure of the institution and the rights of shareholders/members at least for one of the participating entities. The frequency of M&A in the Eurozone has decreased since the global financial crisis. Most of the M&A activity has been focused on the country and has involved smaller target companies, with larger and more stable acquirers serving as consolidators. Overall, consolidation appears to have had a moderately positive impact on the profitability of the banks involved, though high levels of variation suggest significant execution and design risks despite low overall returns on capital in the banking sector. Enhanced post-transaction profitability can be attributed to the lower cost efficiency, liquidity, and capitalization of targets. Cross-border MA transactions have been concentrated among a few small groups of Euro-pean countries, driven by prior financial ties and proximity. Such transactions tend to result in a greater improvement in profitability than domestic mergers, although this effect has decreased since the global financial crisis.

1

What is a Bank Merger?

It is essential to re-examine the significance of banks. (Yakov Amihud) Mergers and Acquisitions (M&A), refer to the consolidation or acquisition of companies, in this case, banks. Large companies can often produce or provide products and services more efficiently to grow and gain advantages of size. Regardless of the reasons, each new deal affects the financial industry. It is important to note that the financial system itself and the credibility on which it operates are fragile, and the failure of one can have significant consequences for a country's economy. It is essential to re-examine the significance of banks. M&A refers to the consolidation or acquisition of companies, in this case, banks. Large companies can often produce or provide products and services more efficiently to grow and gain advantages of size. Therefore, they sometimes acquire other companies, which are referred to as mergers or acquisitions. These transactions are often significant, and costly and can greatly impact companies. The acquisition process is complex and involves various areas, thus companies often seek advice. The varying outcomes of bank acquisitions can be attributed to the fact that they may be motivated by a variety of factors that don't always lead to increased profits. This means that the objectives behind a bank takeover can vary and that this can result in different results. For example, a bank takeover might be motivated by a desire to increase market share, gain access to new customers or technologies, or achieve economies of scale. While these motivations may not necessarily lead to higher profits in the short term, they could help to position the acquiring bank for future growth and profitability. Another example is economies of scale, which are frequently cited as a primary reason for the acquisition, and only apply to small banks, while economies of scope, another commonly cited reason for merging, are difficult to generate and measure. When considering a new acquisition,



Figure 1.1 Putting together bank deals today has a high value

one of the most important questions is: "What is the value of the company?" Generally, companies acquire other companies to achieve cost savings or generate additional income, thus estimating future benefits is crucial, but it is not an easy task. Regardless of the reasons, each new deal affects the financial industry. It is important to note that banks are fragile, and the failure of one can have significant consequences for a country's economy. It is essential to re-examine the significance of banks. One of the most crucial aspects of banks is that they are fragile, and the failure of one can have far-reaching consequences for a country's economy. This is a major reason why they are regulated and supervised - and in chapter five, we will delve into these aspects. Secondly, banks have an information asymmetry problem. Historically, they generate profits from lending, sometimes to individuals or entities for which they lack complete information. This information asymmetry implies that banks have to take risks in conducting business, otherwise, some of their customers may never be able to borrow. In recent years, banks have attempted to decrease information asymmetry by building a long-term record of a customer's history. Thirdly, people tend not to change banks as frequently as they do other service providers. This has resulted in less intense competition for customers in the banking industry compared to other industries. Throughout most of the last century, this has led to overall competition in the banking sector being less intense than in other industries. This implies that competition has to be instigated from the outside, providing justification for authorities to intervene on behalf of shareholders, customers, and often the general public. Banks operate in a financial market where they are the dominant players. In any financial market, there are economies of scale to be leveraged. The larger the market, the larger the economies of scale. In an effort to diversify risk, banks aim to expand into financial markets in order to take advantage of economies of scale. One of the reasons for diversification is risk reduction. The presence of participants in the financial market that operate at the international level has facilitated the globalization of financial services for banks and other financial institutions. In Europe, the adoption of a single currency was intended to eliminate currency risk, thereby increasing competition between institutions that previously faced losses due to currency fluctuations. Greater competition benefits consumers

both borrowers and lenders. Lenders invest where they can receive the highest returns for their savings. Borrowing opportunities that are used wisely can promote economic growth. In Europe, a single market and a single currency are promoted because they enable a country with borrowing needs to do so from any place where there are savings to promote economic growth. It is within this context that mergers in the banking sector have occurred. Research in other industries, where consolidation has also been taking place, suggests that overall, mergers are not advantageous. If this is true for other industries, it is likely also true for banks. Therefore, it is important to study mergers to determine if they are beneficial and for whom. It is expected that a merger will be beneficial to the shareholders of the resulting organization at the minimum. A merger can also be beneficial for a bank's customers and for the general public if, for example, the resulting organization can reduce its fees, improve the quality of its products, expand the range of its product offerings, and operate over a larger geographical area to reach more customers. Ultimately, a merger is beneficial if post-merger performance surpasses pre-merger performance. One of the primary reasons that banks merge or acquire others is to expand due to competition. The larger a bank is, the more products it can offer and the farther it can extend its services geographically. Examining mergers in the financial services industry aims to determine the validity of these claims. An essential aspect of studying bank consolidation is that policymakers can use previous studies to compare them with the performance of firms currently seeking to merge. By doing so, they should be able to predict which mergers are likely to succeed and which might not, and this may guide their decision-making. The relaxation of regulations that existed previously and the introduction of the Euro and legislation to promote competition in Europe have made it possible for mergers to take place at the rate that has been witnessed in the past two decades worldwide. The outcomes of these actions should be examined and evaluated to determine their impact, comparing them with what was intended. Such studies are also useful for potential acquirers and targets to evaluate their prospective partners. Considers the effect of bank mergers on efficiency and shareholder wealth. One of the puzzles associated with bank mergers is the lack of empirical evidence on benefits to the merging parties.

1.1 Five Criteria to set out in the capital requirement directive

The ECB Banking Supervision's role in consolidating banks is dependent on the type of transaction chosen by the banks. The ECB holds a formal role in transactions that involve acquiring a qualifying holding, creating a new bank, or if the merger involves significant

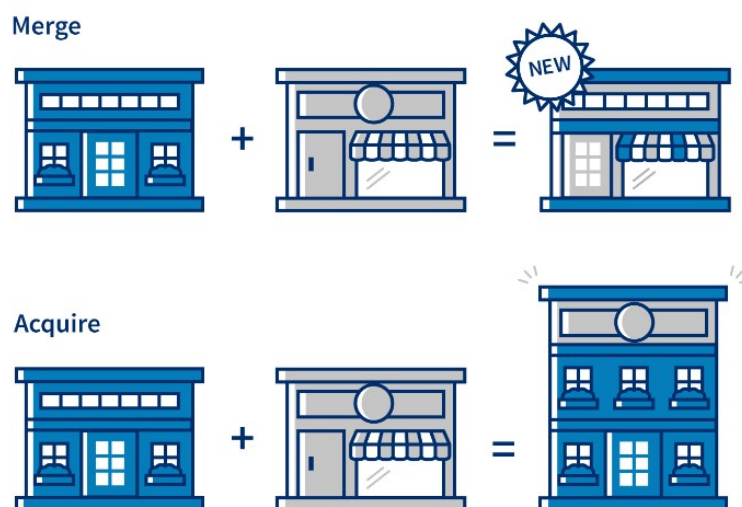


Figure 1.2 Merge and Acquisition visual dynamic

banks and the national law grants the power of approval to the supervisor. Regardless of the type of transaction, it will be evaluated as part of the ongoing supervision of the institutions involved. This means that the supervisors will evaluate the feasibility and sustainability of the deal to ensure that the resulting banking group will be able to comply with all prudential requirements. To do this, they will examine the business model of the bank, including the levels of capital and liquidity, governance, and profitability. Bank consolidation can provide benefits such as removing excess capacity, improving cost efficiency, and promoting more focused business models. Cross-border consolidation can also support risk diversification and contribute to financial market integration. However, it is not the ECB's role to actively promote or avoid bank consolidation. As a supervisor, the ECB must remain neutral and assess each project on technical grounds only. A merger, such as one by absorption, occurs when the parent companies of two banks unite to form a new joint parent company and a larger banking group. The new group's balance sheet comprises the assets and liabilities of the merging banks. The ECB's involvement in a merger is determined by the national law of the countries where the merging banks are headquartered (Eur). This is because mergers are not regulated by European law, but by national law. If the law grants powers to the national supervisor, the ECB will exercise those powers in mergers involving significant banks directly supervised by the ECB. For instance, in Germany, Luxembourg, and some other countries, the national supervisor lacks the power to approve mergers. In these cases, the ECB will review the transaction as part of the ongoing supervision of the institutions involved. However, the merger could trigger a qualifying holdings procedure, which requires the ECB's approval, or a new banking license may be needed, which would involve the ECB as it issues all banking licenses in the euro area. On the other hand, in Italy, Greece, Slovenia,

and Belgium, the national supervisor has the power to approve mergers or is involved in the approval process. In such cases, if two or more significant banks from these countries merge, the ECB Supervisory Board will evaluate the impact of the merger on the resulting bank's profitability, solvency, liquidity, organizational structure, and ability to comply with governance requirements as outlined in the Capital Requirements Regulation and the Capital Requirements Directive. The ECB must give its approval to any acquisition of a significant stake in a bank, which is defined as 10% or more of the shares or voting rights or any other relevant threshold. The bank seeking to acquire the stake must notify the national supervisor, and the national supervisor and the ECB will then evaluate the proposed acquisition against the five criteria outlined in the Capital Requirements Directive:

1. Reputation of the proposed acquirer: The proposed acquirer's reputation is important to consider, taking into account factors such as their integrity, trustworthiness, and the absence of criminal records or court proceedings. Additionally, the acquirer's level of professional competence should also be assessed, which includes their past performance in managing and investing in the financial industry
2. Reputation and experience of the proposed new manager's environment: It is important to determine if the acquirer plans to make changes to the bank's management structure. If so, a thorough evaluation of the qualifications and suitability of the proposed new board members must be conducted
3. Financial soundness of the acquirer: The financial soundness of the proposed acquirer must be evaluated to determine if they have the capability to fund the acquisition and maintain a strong financial foundation in the future. This includes assessing the validity of the business plan and ensuring that the target bank will be able to meet regulatory requirements after the acquisition
4. Impact on the bank: The impact of the acquisition on the target bank must be evaluated to ensure it can still comply with regulatory requirements. For instance, the bank should not be in a vulnerable position as a result of excessive debt used to finance the acquisition. Additionally, the complexity of the acquirer's structure should not impede effective supervision by regulatory authorities
5. Risk of links to money laundering or terrorist financing: It is important to verify that the funds involved in the acquisition are not derived from criminal activities or related to terrorism. The assessment should also consider if the acquisition could potentially increase the risk of money laundering or financing of terrorism

1.2 issue: Too Big To Fail?

Advocates of significant modifications to bank merger regulations often reference research on the concept of "too-big-to-fail" (TBTF) and how bank size affects systemic risk. The reforms to regulation and oversight of the largest U.S. banks post-financial crisis have significantly strengthened the stability of both the U.S. and global financial systems. Consequently, numerous academic studies demonstrate that large U.S. banks do not receive a lower cost of funding based on the belief that they are too big to fail. In 2014, the Government Accountability Office conducted a study that utilized 42 approaches to assess if bigger banks had a lower cost of funding. The majority of the methods used in the report indicated that prior to 2010, larger banks did have a lower funding cost compared to smaller banks. However, after the year the Dodd-Frank Act was implemented, it was found that large banks faced a higher cost of funding as opposed to small banks. A recent study by Berndt, Duffie, and Zhu (2021) discovered that the probabilities of government bailouts for US GSIB holding companies have significantly decreased and have reduced the market value of banks by almost a third. The study also found a similar, but the smaller effect for non-GSIB banks. Atkeson, d'Avernas, Eisfeldt, and Weill (2018) showed that between 1996 and 2007, the perception of an implicit government guarantee accounted for a considerable portion of the market-to-book ratios of US banks. However, after 2011, this perception no longer had a significant impact on bank value. Finally, Minton, Stulz, and Taboada (2019) found that Tobin's q ratio and the market-to-book ratio of bank equity decreased with bank size instead of increasing, which would have been the case if larger banks benefitted from being perceived as TBTF. The U.S. has implemented several policies to tackle the issue of too-big-to-fail (TBTF) following the financial crisis. The increased resolvability of banks has reduced the cost of failure in terms of negative impacts on the financial system and economy. The preparation of "living wills" by large holding companies, their requirement to hold sufficient liquidity, and the issuance of long-term debt at the holding company level, have all contributed to increased resolvability. The FDIC has been granted the authority to resolve a bank holding company in an orderly fashion, thanks to the implementation of the Orderly Liquidation Authority under the Dodd-Frank Act. Additionally, the final regulations prohibiting cross-default clauses in derivatives contracts and limiting the issuance of short-term debt at the holding company level, have addressed legal obstacles to the resolution process. The U.S. government has taken steps to decrease the expectation of government intervention in the financial system by limiting the powers of key institutions. The Federal Reserve Board (FRB) can no longer provide loans to individual non-banks, while the Federal Deposit Insurance Corporation (FDIC) has restrictions on its ability to guarantee bank liabilities. The Treasury Department's

access to funding used for insuring money market mutual funds has been restricted, and the authority for Treasury's Troubled Asset Relief Program (TARP) which was used to increase the capital of banks has been terminated. The Basel III framework introduced a surcharge on systemically important banks in order to mitigate the effects of their failure on the financial system. The Basel Committee established a methodology for identifying systemically important banks, which is based on five factors: size, interconnectedness, complexity, cross-border operations, and substitutability. Additionally, recent regulatory changes to introduce graduated tiers for applying enhanced standards have added to the significance of being considered more systemic. In order to address the aftermath of the financial crisis, the Dodd-Frank Act in 2010 integrated a financial stability aspect into the Bank Holding Company and Bank Merger Acts. At present, the Federal Reserve Board (FRB) employs the five metrics defined by the Basel Committee to identify Global Systemically Important Banks (GSIB) and assess the potential financial stability risks of merged entities. Additionally, the FRB also takes into account qualitative factors, such as the complexity of the merged entity, in determining the potential challenges in resolving it in the event of default.

1.3 The impact of a different bank characteristic on risk and performance

Recognizing the connection between financial stability and price stability, the ECB's recent strategy review looked into the role of financial stability in its monetary policy decisions. The review considered factors such as the impact of monetary policy on financial stability, the relationship between monetary and macroprudential policies, and how financial stability analysis could be integrated into the decision-making process. This box summarizes the most important aspects and their impact on monetary policy. The relationship between price stability and financial stability is largely reciprocal: Financial crises tend to lead to rapid de-risking and deleveraging, with negative consequences for economic growth and inflation. This makes it harder for central banks to achieve price stability because the transmission mechanism of monetary policy is impaired. To prevent systemic crises and increase the resilience of the financial sector, prudential policies (macroprudential, supervisory, and well-designed regulations for financial institutions) help ensure the smooth transmission of monetary policy and support price stability. In turn, monetary policy also contributes to financial stability in several ways. During recessions, it stabilizes the economy, reducing losses for the financial sector and inflation, and avoiding debt-deflation spirals. Furthermore, it curbs bank runs and

fires sales during periods of financial stress. Over the long term and often in the short to medium term, actions in both policy domains complement each other. Monetary policy must consider the financial stability situation and macroprudential policy posture: Monetary and macroprudential policies share common transmission channels, leading to a significant potential for interaction between the two policy areas. For instance, increasing macroprudential capital requirements may enhance the financial system's resilience and reduce the impact of financial shocks on inflation. However, depending on the economy's state, this could lead to a decrease in bank lending, causing deflationary pressure. In a thriving economic climate with upward price pressure, both policy areas would complement each other. However, when systemic risk accumulates in a low-inflation environment, some trade-offs may arise. Regardless of the scenario, information about the macroprudential policy is crucial for monetary policy decisions. It has been recognized that monetary policy, including both traditional and unconventional measures, may have negative impacts on financial stability: Lower interest rates can encourage risky behavior, which can result in excessive risk-taking and the buildup of systemic risk. The financial stability impact of monetary policy can be reduced by adjusting its instruments, as seen with the ECB's targeted longer-term refinancing operations (TLTROs) which exclude housing loans to prevent real estate bubble formation or its tiered system for excess reserve remuneration. However, the potential for financial stability side effects cannot be completely eliminated. They can occur when financial intermediaries take on more credit, liquidity, and duration risk in their pursuit of yield and due to related misalignments in asset prices. Low-interest rates also affect the financial resilience of intermediaries. For banks, lower interest rates reduce net interest margins but also result in one-time valuation gains on securities and a positive economic outlook that boosts lending volumes and asset quality. Currently, these effects largely cancel each other out, but the negative effects of low-interest rates could worsen over time. For certain types of non-banks, low rates may harm their financial positions. The idea of using monetary policy to counter financial imbalances is controversial and presents practical challenges: It is generally accepted that a strong monetary policy response is needed to restore the effectiveness of monetary policy during a financial crisis and address any potential distortions in incentives through a robust macroprudential framework. However, previous research suggests that monetary policy is not precise enough to address specific financial issues in sectors or countries. This is particularly relevant in a monetary union where financial cycles are not consistent across all states. Furthermore, since financial cycles move slowly, using monetary policy to counteract imbalances could result in a prolonged period of below-target inflation, which could undermine price stability and destabilize inflation expectations. It's important to note that monetary policy should not be expected to ensure financial stability. Instead, the build-up of systemic risk should be

primarily addressed by macroprudential policies: The aforementioned adverse effects should be countered by using micro- and macroprudential measures that target the specific section of the financial system that's impacted and address the root cause of the vulnerability. Evidence shows that, when available, macroprudential measures have been effective in mitigating systemic risk. Currently, the macroprudential framework does not fully encompass non-bank financial intermediaries. Additionally, macroprudential policies may have limited ability to reduce bank lending during an economic downturn. These limitations could lead to a need for more aggressive monetary policy action in response to unfavorable conditions. Against this backdrop, the ECB's new monetary policy strategy calls for a flexible approach when taking financial stability into account. The ECB's medium-term focus on price stability allows it to factor in financial stability considerations in its monetary policy decisions, when necessary to maintain price stability. Regular evaluations of the interplay between monetary policy and financial stability will be conducted as part of monetary and financial analysis and taken into consideration by the Governing Council during monetary policy meetings. These evaluations will provide a more comprehensive evaluation of potential financial risks over the long term and their impact on output and inflation, as well as determine the effectiveness of macroprudential policies in mitigating any relevant financial stability risks from a monetary policy perspective.

1.4 Monopoly and efficiencies

One way to determine the level of concentration in the banking sector is to examine the trend in the share of bank profits over time. If the banking sector is seen to be becoming too concentrated, the share of bank profits would be rising, meaning that banks would be earning "monopolistic profits" (Mon). This trend can be analyzed by calculating the ratio of net income to total assets in the banking industry, which is similar to calculating the share of profits to nominal GDP. The Federal Reserve Bank of New York publishes a range of banking statistics, including the return on assets, which is the aggregate amount of bank profits relative to assets. Exhibit 5 displays the profits-to-assets ratio from Q1 1991 (the earliest available data) to Q3 2021. The ratio of bank profits to total assets, which is an indicator of the concentration level in the banking industry, has generally remained steady, averaging 0.9% throughout the entire study period. This ratio was slightly higher than 1% during the mid-1990s to the start of the global financial crisis, and then gradually increased from 0.5% in Q1 of 2010 to 1% at the beginning of the COVID-19 pandemic. It's important to note that during economic downturns, such as the ones seen in 1991, 2008-2009, and 2020, bank profitability significantly decreases compared to the average profit share.

Studies on the impact of mergers on bank performance are inconclusive, as the results are dependent on proper execution and strategic fit: Research from both the US and Europe on the effect of M&As on bank performance shows mixed results. One study prior to the global financial crisis showed that M&A had a moderate positive impact on bank profitability, with the success factor being strategic similarities for economies of scale. However, merging dissimilar banks is often costly. The impact of M&As is more favorable during a financial crisis due to favorable valuations. Other studies found M&As to have a slightly negative effect on profitability but a positive impact on cost efficiency, which indicates cost savings are passed on to customers in a competitive market. Bank profitability from cross-border mergers may vary from that of domestic mergers, depending on when the mergers take place. Those completed in the late 1980s and early 1990s showed no significant improvement in ROE, whereas later cross-border mergers appear to have performed better than domestic ones. However, poor performance following cross-border mergers can stem from issues before the merger or from factors such as an overpriced deal, inadequate execution, or an inability to alter the target's strategy. Cross-border and domestic bank mergers tend to yield varying levels of post-merger profitability, depending on various factors such as capital and liquidity positions, cost inefficiencies, and timing of the transactions. Before the global financial crisis, about 51% of M&A deals led to improved return on equity (ROE), and this figure rose to 57% after the crisis. Mergers between less cost-efficient banks tend to result in higher profitability compared to those between more efficient banks, as M&A may provide a catalyst for cost savings. The median capital ratio of the acquiring bank in profitability-enhancing deals is usually higher than that of the target bank, while the link between capitalization and merger success is less clear. In conclusion, it seems that bank mergers and acquisitions with lower liquidity tend to lead to improved profitability. This suggests that excessive liquidity may prevent banks from taking advantage of business opportunities.

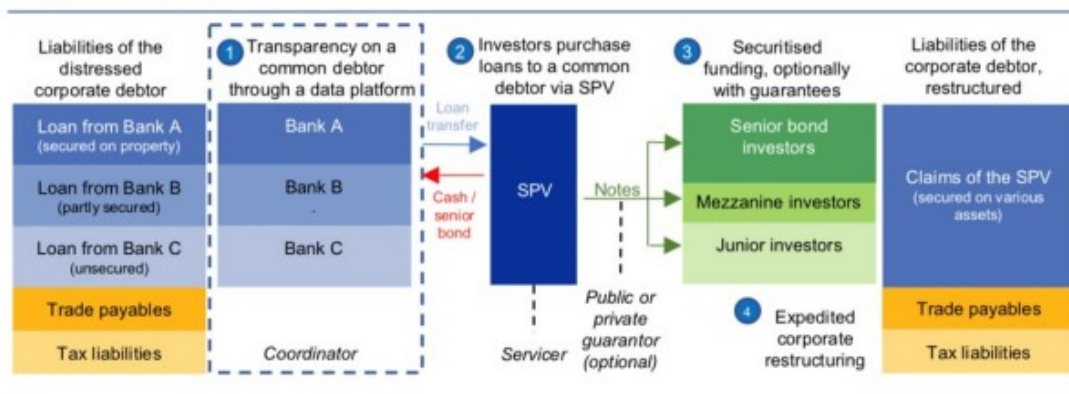
1.5 NPL and defaults

Since 2014, many European and individual initiatives have been implemented to lower non-performing loan (NPL) amounts on the balance sheets of euro-area banks. The NPL ratios have decreased, but slowly, mainly due to sales to non-bank investors. Despite the increased market activity, the prices paid for NPLs have only slightly improved and remain lower than the values assigned by banks. One type of NPL that has proven challenging to handle is multi-creditor loans to non-financial companies. An examination of these loans shows lower provision coverage by the lending banks, indicating more optimistic evaluations and limited recognition of the required costs for multi-creditor coordination. To address this issue, this

article suggests using data platforms to provide pre-existing transparency to NPL investors, alongside NPL securitization, which could significantly reduce the difference between the value of loans on banks' balance sheets and the prices offered by NPL portfolio investors. At the same time, there has been progressing in NPL market conditions and infrastructure. The asset pools in NPL markets have broadened to include secured loans, and the widespread use of NPL securitizations has led to the creation of market standards, such as the GACS data template in Italy for information sharing. However, transparency for potential NPL buyers is still limited, perpetuating the "lemon market" issue and deterring investor involvement. The infrastructure for loan servicing has expanded to support the growing NPL market, and further harmonization is expected with the proposed EU Directive on credit servicers and buyers and actions under the EU's 2020 NPL Action Plan. Based on a sample of transactions, NPL prices appear to have improved after 2017, despite a temporary decrease during the COVID-19 pandemic, with higher prices achieved for portfolios with a higher percentage of secured assets. However, the compensation required by NPL investors is still substantial, which means that banks that sell NPL often experience significant losses. Although single-seller deals are still the norm, there have been transactions that involve multiple selling banks pooling their NPLs, and smaller banks have also entered the NPL market. This feature is organized as follows: it first examines the issue of creditor coordination for corporate NPLs as a source of market inefficiency and financial stability risks, as banks may face significant losses from selling NPLs. The next section examines solutions to market inefficiency, and the final section summarizes the findings.

1.6 The creditor coordination problem as a source of market failure

Corporate lending in the euro area commonly involves loan relationships with multiple banks. Data indicates that most corporate credit is granted to companies that have multiple bank creditors. Large firms tend to have a larger number of creditor relationships than other firms, but SMEs also borrow from multiple banks. Multi-bank credit relationships are overrepresented in non-performing loans. Older loan vintages, on average, have more creditors than younger ones. These observations suggest that resolving multi-creditor relationships can take longer and present coordination difficulties in resolving both large and small non-performing loans. Exploring a combination of theory, evidence, and practice could provide valuable insights into potential policy solutions for improving NPL resolution. Limited transparency may lead to market failure due to inadequate coordination among creditors. To address this



Source: ECB staff illustration.

Note: SPV: special-purpose vehicle.

Figure 1.3 Schematic outline of a securitization-based approach to working out multi-creditor corporate NPLs

issue, the consolidation of a distressed firm's debt by a single investor, as performed by some all-encompassing AMCs, may be effective. A pre-trade NPL data hub could significantly enhance NPL resolution. The success of private sector-led securitization schemes, such as GACS and HAPS in Greece, highlights the possibility of resolving NPLs without relying on public sector sponsorship and avoiding State aid implications from a system-wide AMC. A multi-layered approach could be considered based on the desired level of the scheme's ambition. Transparency in common borrower relationships among banks can be achieved through data and coordination platforms. A dedicated coordinating platform can collect data on shared borrowers from participating banks, using standard data definitions already used in existing data collections. By participating, there is an increased chance of successful NPL resolution and higher NPL sales prices.

2

Enforcement policy respecting bank merger

Enforcement policy with regards to bank mergers is a crucial aspect of regulatory oversight. It ensures that the consolidation of two or more banks meets the requirements of competition law, consumer protection regulations, and other relevant legislation. The objective of enforcement policy is to prevent anti-competitive practices and to ensure that the merger does not negatively impact the stability of the financial system. The role of the enforcement agency is to review the proposed merger and make a determination as to whether it is in the best interest of consumers, competition, and the financial system. This involves a thorough analysis of the potential benefits and drawbacks of the merger, as well as an evaluation of any conditions or obligations that may be necessary to mitigate potential harm to competition or stability. Ultimately, the enforcement policy seeks to promote a fair and competitive banking sector while ensuring the stability of the financial system.

2.1 Benefits and disadvantages of bank mergers

An alternative method of evaluating the level of concentration in the banking sector is to observe the changes in the portion of bank profits over time. If there are apprehensions that the banking sector is becoming excessively concentrated, the share of bank profits would increase over time as banks would be obtaining "monopolistic returns." A logical way to examine the share of bank profits is to compute the net income to total assets ratio in the banking sector (the results are comparable by using the share of profits to nominal GDP). Federal Reserve Bank of New York releases various banking statistics including the total sum of bank profits. The return on assets also referred to as relative to assets, is

displayed in Exhibit 5. It shows the ratio of profits to assets from the first quarter of 1991 (the earliest available data) to the third quarter of 2021. Generally, the proportion of bank profits compared to total assets has been consistent and averages around 0.9% throughout the entire period. The ratio of profits to assets was slightly higher than 1% from the mid-1990s to the beginning of the global financial crisis. After the crisis, this ratio gradually increased from roughly 0.5% in the first quarter of 2010 to 1% at the start of COVID. It's worth noting that during economic downturns, such as those in 1991, 2008-2009, and 2020, bank profitability is significantly lower than the average profit share. Several studies have shown the positive impacts of bank mergers. These benefits include efficiency gains and economies of scale for the merging institutions. Economies of scale come from the large fixed costs of production being spread over a high volume of output, resulting in a decrease in the average cost of production as the rate of production increases. In the banking sector, physical capital, such as physical branches, technology infrastructure, compliance costs, and other overhead expenses, may result in significant fixed costs and the corresponding economies of scale that make mergers advantageous. Previous research that utilizes data from the 1980s found evidence of economies of scale up to a modest extent, indicating that efficiency improvements result from mergers between local banks or the acquisition of small banks by larger ones. According to several studies by the Federal Reserve Bank (Rhoades 2000, Adams 2012, and Kowalik et al. 2015), the majority of mergers occur between community banks and have long been acknowledged for yielding substantial economies of scale. More recent studies indicate that economies of scale are more substantial than previously thought. Hughes, Mester, and Moon (2001) and Hughes and Mester (2013), using data from 1994 and 2003-2010 respectively, found significant scale returns for banks of all sizes. Feng and Serletis (2010), using data on US banks with assets over \$1 billion from 2000 to 2005, discovered that scale economies played a role in boosting productivity among the largest banks. Wheelock and Wilson (2012), with data on all US commercial banks from 1984 to 2006, observed evidence of increasing scale returns even for the largest banks, concluding that industry consolidation was driven by scale economies, in part. Advocates for a stricter merger policy argue that bank mergers result in a decrease in small business loan availability. However, the overall academic research does not support the notion that bank mergers result in a consistent decrease in the provision of bank loans to small businesses. According to the academic literature, reductions in the supply of bank loans to small businesses that occur after bank mergers are not the result of decreased market competition. Instead, these declines are connected to changes in organizational culture or loan-origination processes that impact lending relationships. Therefore, these findings do not have any antitrust implications. According to academic studies, the relationship between bank mergers and lending to small businesses is complicated

and influenced by various factors such as bank size, location, culture, ownership, and the time frame analyzed. However, a widely supported conclusion is that mergers among community banks result in an increase in small business lending. The relationship between bank mergers and small business lending is complex, and it depends on various factors like bank size, location, culture, ownership structure, and the time period analyzed. Some studies show that mergers between banks with similar lending focus or strategy result in increased small business loan originations, while others show the opposite effect. A commonly cited reason is that lending to small businesses usually involves building relationships and relying on "soft" information that is acquired gradually and not easily passed on to other lenders. This is supported by Nguyen (2019) although the findings apply specifically to mergers between large banks with similar branch networks. The market context surrounding bank mergers is an intriguing aspect to consider. Some research has investigated the time when geographic limitations on banking within a state or between states were being lifted. Some banks, protected from competition by these limitations, may have been functioning ineffectively, for example, by not thoroughly evaluating borrowers or practicing subpar lending methods. When these entry restrictions were lifted, these banks became attractive targets for acquirers seeking to overcome their shortcomings. Berger, Saunders, Scalise, and Udell's (1998) study is a seminal work exploring the impact of bank consolidation on small business lending. The authors' findings suggest that, initially, bank mergers tend to negatively impact small business lending, but this impact can be counteracted by the response of other banks in the same market or by changes in the merged entity's organizational structure.

2.2 Socio economic effects of bank mergers

Critics of bank merger policy argue that bank mergers result in negative socio-economic impacts on lower-income communities, including an increase in property crime. This is supported by the findings of a study by Garmaise and Moskowitz (2006), which shows that the effects of a merger vary depending on whether the merging banks were major competitors in the same local area prior to the merger. If they were, the study found that the post-merger decline in commercial real estate lending and property development led to a decrease in local property prices, a drop in median income, an increase in income inequality, and a rise in burglaries and property crime, particularly in low- to moderate-income neighborhoods. Critics argue that the performance of merging large banks that were major competitors in the same local area may differ from other banks and neighborhoods during this period, but this experience cannot be used to draw general conclusions about the effects of bank mergers in general. In other words, the results are not generalizable. Did bank mergers lead to an

increase in crime? The findings of Garmaise and Moskowitz (2006) do not provide a solid connection between the neighborhood outcomes and the bank mergers in question. A more

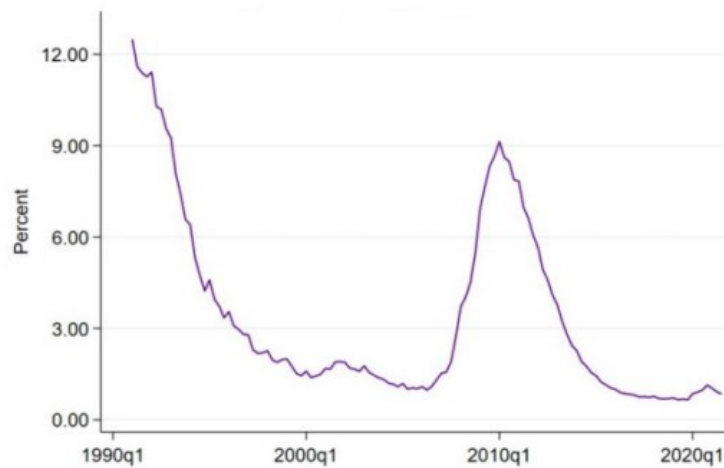


Figure 2.1 Delinquency Rate on Commercial Real Estate Loans (Q1 1991 - Q3 2021) (Kanter)

likely explanation for the results, given the historical context, is that the acquiring banks were taking actions to address inherited weaknesses, such as tightening commercial real estate lending standards and reducing lending in areas that had a high risk of credit losses. These areas often had an oversupply of credit, overvalued properties, and excessive development, resulting in the negative outcomes seen in the study after the end of the boom. Although it may seem like the decrease in commercial real estate lending due to the mergers led to the outcomes, it was actually the result of the same underlying economic dynamics. It's not possible to determine that the post-merger reduction in commercial real estate lending was harmful overall. While lower-income families may have been affected by the increase in rent prices during the overheated CRE market, the end of the boom led to more affordable neighborhoods. The findings in the study suggest that the outcomes may partially reflect gentrification being partially reversed, resulting in the restoration of affordability and an influx of lower-income households, a more diverse income distribution of residents, and a slight increase in property crime.

2.3 Effects of bank consolidation on the affordability of bank transactions accounts

One of the criticisms aimed at bank mergers and acquisitions, especially when a large bank acquires a smaller one, is that it leads to increased fees for retail transaction account customers and drives some of them away from banking services. This issue is supported by research

that indicates that large banks typically charge higher monthly fees for transaction accounts and require larger minimum balances to avoid these fees. However, as acknowledged in previous studies, these studies don't prove that customers of large banks are worse off because they don't consider both the price and non-price aspects of transactions. Large banks have the advantage of offering a wider network of branches and ATMs, which provide greater convenience. In contrast, customers of small banks often face limitations in convenience and may also incur account-related fees not captured in these studies, such as ATM surcharge fees and check usage fees. This aspect of the analysis is also limited by significant data constraints. The data only identifies standalone check cashing locations and neglects to account for check cashing services available at big retail chains like Walmart and fees charged by some banks for non-customers. As a result, the emergence of a new check-cashing outlet in the neighborhood could be influenced by factors not accounted for, such as the removal of high-fee check-cashing at the acquired branch after the merger or the neighborhood's distance from large retail stores offering check-cashing services. In addition to these shortcomings, the study's relevance has diminished in the current banking landscape. Over the past decade, financial inclusion, as indicated by the percentage of the population without bank accounts, has significantly improved. This is largely due to the availability of low-cost transaction accounts at both large and small banks, as mentioned in a recent study by BPI. Consumers will ultimately choose a bank that offers their desired combination of convenience, benefits, and fees. With the rise of online banking and the availability of low-cost transaction accounts, consumers have more options than ever before to select a banking relationship that suits their needs.

2.4 Are mergers Affecting competition?

Some policymakers are worried about the impact of bank mergers on competition, with two main points of concern:

1. The decline in the number of community banks due to mergers
2. The emergence of a small number of banks that are "too big to fail" with excessive market share, hindering market competition.

The banking industry has undergone a long-term consolidation trend, mainly through mergers and acquisitions. This was facilitated by the lifting of state and federal restrictions on multiple branches and bank operations, particularly across state borders. The removal of these restrictions in the 80s and 90s led to economies of scale, making it profitable for banks to expand and leading to numerous small banks merging. Between 2001 and 2020, the

number of FDIC-insured institutions fell from 9,613 to 5,002, with mergers outnumbering failures by nearly 10 to 1 and new banks by 5 to 1. In 2020, there were 168 mergers, 6 new banks, and 4 failures. Despite this consolidation, the market still offers a reasonable degree of competition, with nearly 5,000 institutions, many of which are small community banks. One of the largest banks is unable to expand through mergers as they surpass the stated concentration limits. For instance, JPMorgan Chase and Bank of America seem to be restricted by the 10% national deposit limit. Instead, these major firms have seen growth in recent years through internal expansion, which is not bound by regulations on concentration limits or other banking rules. However, the growth of Wells Fargo is currently limited by enforcement action. This has resulted in fewer but larger "mid-size" banks, but it's unclear if the national banking sector has become more or less competitive (it may have become less competitive in some local areas where these banks operate). The merging of two mid-sized banks might give them a stronger competitive advantage against the largest banks. To put it another way, there may be competition issues with the largest banks, but these have not been caused by post-crisis mergers.

3

The Italian banking system consolidation case

This study assesses the argument for banking sector consolidation in Italy, gauges the impact on profitability, and explores policy alternatives to promote an efficient consolidation process. The chapter is structured as follows: It critically assesses the case for efficiency gains in Italy by comparing Italian banks with European counterparts and exploring diversity among banks within the country, probes the potential for increased profitability from cost efficiency, and scrutinizes the role of consolidation in achieving efficiency gains by reviewing the consolidation literature and extracting relevant lessons. The final section delves into ways to make the ongoing consolidation process in Italy as effective as possible to maximize the benefits.

3.1 Profitability measure - Return on equity and RoE graph

This paper analyzes the arguments for consolidating the banking sector in Italy, assesses the potential impact on profitability, and explores policy options to optimize the consolidation process. It begins by evaluating the need for efficiency gains in Italy by comparing Italian banks to their European peers and examining differences among banks within the country. The paper then explores the potential for cost-efficiency gains and the role of bank consolidation in achieving these efficiencies. The literature on bank consolidation is critically examined to identify useful lessons. Finally, the paper discusses ways to make the ongoing consolidation process in Italy as effective as possible in order to maximize its benefits. The Italian banking sector is struggling with weak profitability and poor asset quality, which is reflected by one of the lowest returns on equity in the EU. The low profitability is due

to several factors, including challenges in increasing revenue in a low-growth, low-interest rate environment, especially for a system with a high proportion of its assets devoted to lending. Structural issues, such as relatively high operating costs compared to other European countries, also contribute to low profitability. Additionally, legacy issues such as high levels of nonperforming loans and the need for provisioning add to the challenges. Recognizing these difficulties, the Italian government enacted several reforms. Efforts have been made to address the issues with asset quality, including adjustments to the framework for insolvency and enforcement and state guarantees for specific types of non-performing loan securities. To promote consolidation in Italy's dispersed banking sector, legislation was passed to revamp the governance structure of the more significant cooperative (Popolare) banks.

3.2 How much could bank profitability increase from greater cost efficiency?

We use straightforward metrics for efficiency, such as the cost-to-income ratio and return on equity (RoE). A more refined method would involve conducting an analysis of efficiency frontiers and calculating the distance of each bank from the frontier to gauge its efficiency level. Italian banks have some of the highest structural costs in advanced European nations when normalized by total assets. In recent years, Italian banks have spent 2% of their assets on operating expenses, which is notably higher compared to the spending of other major economies in the Eurozone, like Germany, France, and Spain.

3.3 The Italian banking system is fragmented

Cross-border M&A As could be beneficial for several reasons. First, if consolidation were to take place at the European level, it could reduce cross-border fragmentation and overcome the domestic or home bias of the overwhelming majority of banks. The existence of more banks with a pan-European outlook could enhance risk pooling and help weaken the link between the macroeconomic risks existing in each country and the stability of its banking system, adding robustness to the monetary and banking union (IMF). Despite the potential benefits, cross-border mergers and acquisitions (M&A) in the banking industry face several challenges (Del). These include political and regulatory barriers, as the banking sector is often considered crucial for both the economy and financial stability. There are also issues with the design of the banking union, as some national supervisors tend to protect their own banks. Legal challenges and cultural differences can also hinder cross-border bank M&A.

The small number and infrequency of these types of transactions are often attributed to these implicit or explicit barriers to market integration. This paper highlights significant diversity among Italian banks in a fragmented system. There are more banks and lower levels of market concentration compared to most other eurozone countries. Although some Italian banks have higher profitability ratios than the EU average and lower cost-to-income ratios, others lag far behind. This applies to both large and small banks, with a significant spread among bank types. Some mutual and Popolare banks are profitable and cost-efficient, but most others are struggling. The case of Mediobanca is in contrast with this analysis, the reason why is because Mediobanca has low-interest rate sensitivity compared to commercial banks with higher deposits intrinsic low-interest rate sensitivity due to many reasons, see Fig 3.1

- **L/D ratio at 180%** materially above industry average which, however, reflects a **more favorable MREL position**
- **Prudent ALM approach:** matched ALM position which, however, proved to be supportive to NII growth in the medium term
- **Prudent accounting:** TLTRO smoothing **NII growth drivers ahead:**
- **Loans volume growth** due to ongoing commercial effort
- **Sensitivity gradually materializing** due to loans book quick repricing (short duration and floating rate exposure) and discontinued deposits hedging (currently 50% unhedged)
- **Effective funding** channel and instruments diversification resulting in high funding volumes at competitive levels

Figure 3.1 Mediobanca's Different Interest Rate Sensitivity (Med)

3.4 Banking System Consolidation: An Aid to Efficiency Gains, but Not a Solution to Sector Problems

In Italy, achieving profitability in the banking sector requires a comprehensive strategy that goes beyond relying solely on mergers and acquisitions (M&A). Other measures are crucial, such as implementing growth-enhancing structural reforms and taking active steps to resolve non-performing loans (NPLs). Some large banks must also rationalize their operations in order to increase efficiency. Mediobanca is a recent example of a bank that has taken these steps, with a large capital raising plan and efforts to reduce the stock of NPLs. Whether other banks will follow suit remains to be seen, and the outcomes from similar efforts in other countries must be considered when creating a strategy to maximize the benefits of these measures

3.5 Maximizing Benefits from Cross-Country Consolidation: Lessons Learned

The experiences and insights from other countries and the literature emphasize the significance of enhancing governance and addressing any remaining obstacles to efficiency improvements during the consolidation process. This includes strengthening supervisory oversight and taking prompt corrective action as necessary, as well as resolving structural limitations that may limit efficiency gains. The European Union (EU) level also has a role in promoting a fair playing field for cross-border mergers and acquisitions (M&A), which studies have shown can be more efficiency-enhancing than domestic M&A (Cro).

4

Casual Effect of M&A through the Bank of America and Merrill Lynch case

The global financial crisis of 2008 was a major financial crisis that affected economies around the world, including the US. It was caused by a combination of factors, including the proliferation of subprime mortgages, the declining value of securities backed by these mortgages, and a general lack of regulation and oversight of the financial sector. For Bank of America and Merrill Lynch, the crisis had a significant impact. Bank of America had already acquired Countrywide Financial, one of the largest originators of subprime mortgages, and was facing significant losses as a result. Merrill Lynch, one of the largest investment banks in the world, was also facing significant losses due to its exposure to the subprime mortgage market. To address these losses, Bank of America agreed to acquire Merrill Lynch in a government-brokered deal in September 2008. The acquisition was seen as a way for Bank of America to strengthen its balance sheet and improve its financial position, as well as provide stability to the financial system. However, the acquisition was not without its challenges. Bank of America faced criticism for the high cost of the acquisition, as well as for its handling of the crisis, which led to the US government providing financial support to the bank. Despite these challenges, the acquisition allowed Bank of America to emerge from the crisis as one of the largest and most well-capitalized banks in the world. This acquisition is an example of a Mergers and Acquisitions transaction. M&A refers to the process of two companies merging or one company acquiring another. In this particular case, Bank of America acquired Merrill Lynch in order to improve its financial position and strengthen its balance sheet during the global financial crisis. The acquisition allowed Bank of America to benefit from the resources and expertise of Merrill Lynch, including its investment banking operations and its large client base. This M&A was driven by the desire of Bank of America to address the financial challenges it was facing and to secure its position in the market during a time of uncertainty and instability. The acquisition was seen as a way to enhance the competitiveness and stability of Bank of America and improve its ability to serve its customers and clients.

The following paragraph concerns a study about this M&A. Section 4.1 explains the Granger Causality, what it is, and how it can help us understand some effects of this significant M&A, and then the data that was collected to obtain the results. These results are shown and explained in section 4.2, which also includes the python code that was used to obtain the Granger Causality Test.

4.1 Granger Causality Test

Time series forecasting normally is used univariate data to predict future values, for instance, Figure 4.1 shows us MedioBanca's price data for several months. If we are to predict the prices of MedioBanca's stock then we will use the past data or past values of the prices of MedioBanca stock. However, when is important to understand the relationship between

Mediobanca Banca Di Credito Fnnzr SpA



Figure 4.1 MedioBanca price stock in the last year

several components or get better forecasting then we need multiple series. This is common in financial time series so one stock market will get affected by the movement in another stock market. An example is observable in Figure 4.2. Thus knowing the interrelation is very important for better forecasting. This is the reason why is important to know what is Granger Causality: $X(t)$ granger causes $Y(t)$, if the past values of $X(t)$ helps in prediction the future values of $Y(t)$. Where $X(t)$ and $Y(t)$ are two different time series.

1. Cause happens prior to affecting: In mathematical words,

$$y_t = f(x_{t-1})$$

where y_t is the cause and x_{t-1} is the effect. The cause is computed not in the same period of x_t

2. Cause has unique information about the future values of its effect:

$$y_t = a_1 y_{t-1} + b_1 x_{t-1} + \epsilon_1$$

it means that the lags of x_t help to predict the value of y and the presence of the lag of y_t , it means that it has an extra effect

Thus

$$y_t = f(y_{t-p}, x_{tp})$$

where p stands for the lag time. So y_t is not just a function of its past but also the lag of x_t . In this case, is possible to say that x_t granger causes y_t .

To calculate the Granger Causality test, the following steps are typically followed:

1. Establish the time series data: Obtain the historical data for the two-time series X and Y, typically as a time-ordered sequence of values.
2. Specify the lag order: Determine the number of lags included in the analysis.
3. Run regression analysis: Estimate the regression equation for Y as a function of X and its lags, as well as any other relevant variables.
4. Test the null hypothesis: The null hypothesis is that X does not Granger cause Y. To test this hypothesis, the statistical significance of the coefficients on the lags of X in the regression equation is tested.
5. Interpret the results: If the coefficients on the lags of X are found to be statistically significant, then X can be said to be Granger cause Y.
6. The exact mathematical formula for the Granger Causality test will depend on the specifics of the data and the regression analysis conducted. However, the basic principle is to test the significance of the coefficients on the lags of X in a regression equation for Y.

The Granger Causality test is based on the hypothesis that the coefficients for the lagged values of one time series are zero, meaning that changes in the other time series are not

significant predictors of changes in the first time series. The null hypothesis is: [

$$H_0 : \beta_1 = \dots = \beta_p = 0$$

] This formula states that the coefficients $(\beta_1, \dots, \beta_p)$ for the lagged values of one time series are zero, meaning that changes in the other time series are not significant predictors of changes in the first time series. This hypothesis is tested to determine if there is a causal relationship between the two-time series. If the null hypothesis is rejected, this indicates that the changes in the first time series are significant predictors of changes in the other time series. If the null hypothesis is rejected, this indicates that the changes in the one-time series are significant predictors of changes in the other time series and that there is a causal relationship between the two series. The result of the test can be expressed as a p-value, which indicates the probability of observing the test statistic under the null hypothesis. If the p-value is below a certain significance level (usually 0.05), the null hypothesis is rejected, and the conclusion is that there is Granger causality between the two-time series.

4.2 Data

The data used in order to compute the granger causality is taken from Yahoo Finance (Yah). Yahoo Finance is a website and platform that provides financial news, data, and information for global markets. It offers a variety of financial data and analysis tools, including stock quotes, market summaries, financial news, portfolio management, and other related financial information. The platform is designed for individual investors and traders and provides a wide range of data and analysis on stocks, bonds, mutual funds, currencies, commodities, and other financial instruments. Yahoo Finance also provides various financial calculators and tools to help users make informed investment decisions. Data taken from this website concerns the Historical Data of the two banks, Bank of America and Merrill Lynch from 2003/2004-2023, in particular about *AdjClose* value. *AdjClose*, short for Adjusted Close, is a stock price that has been adjusted for dividends, stock splits, and other corporate actions. It reflects the end-of-day price that a stock trades for after taking into account these events. This adjusted price is used to provide a more accurate representation of a stock's value over time and to account for the impact of events such as stock splits and dividend payments. In financial analysis, *AdjClose* is often used as a measure of a stock's price performance, as it allows for a fairer comparison of stock prices across different time periods and ensures that corporate actions are reflected in the analysis. Is important to say that the data collected

represents the years prior to the 2008 (Mer) financial crisis and those following it up to the present day.

4.3 Results

The library used to computer the granger causality test on python is named *grangercausalitytests* and provides an implementation of several statistical tests to determine causality between two-time series. It allows users to perform Granger Causality tests and obtain the results in a simple and efficient manner. To use the library in Python import it in the code using *grangercausalitytests*. To perform a test, you can call one of the available test functions, passing in the time series data as arguments. The library provides several test functions and the results of the test are returned as a statistical score and a p-value, which can be used to interpret the causal relationship between the two-time series.

```
#!/usr/bin/env python
# coding: utf-8

# In [1]:

import matplotlib.pyplot as plt
import seaborn as sns
import numpy as np
import pandas as pd

df = pd.read_csv(r"C:\Users\ambur\OneDrive\Desktop\BAC&IPB.csv")

x = df.index
y1 = df['AdjClose_IPB']
y2 = df['AdjClose_BAC']

# Plot Line1 (Left Y Axis)
fig, ax1 = plt.subplots(1,1,figsize=(16,9), dpi= 80)
ax1.plot(x, y1, color='tab:red')

# Plot Line2 (Right Y Axis)
ax2 = ax1.twinx() # instantiate a second axes that shares the same x-
axis
ax2.plot(x, y2, color='tab:blue')

# Decorations
# ax1 (left Y axis)
```

```

28 ax1.set_xlabel('Time', fontsize=20)
ax1.tick_params(axis='x', rotation=90, labels=12)
30 ax1.set_ylabel('AdjClose_IPB', color='tab:red', fontsize=20)
ax1.tick_params(axis='y', rotation=0, labelcolor='tab:red')
32 ax1.grid(alpha=.4)

34 # ax2 (right Y axis)
ax2.set_ylabel("AdjClose_BAC", color='tab:blue', fontsize=20)
36 ax2.tick_params(axis='y', labelcolor='tab:blue')
ax2.set_xticks(np.arange(0, len(x), 60))
38 ax2.set_xticklabels(x[::60], rotation=90, fontdict={'fontsize':10})
ax2.set_title("Visualizing Leading Indicator Phenomenon", fontsize=22)
40 fig.tight_layout()
plt.show()

```

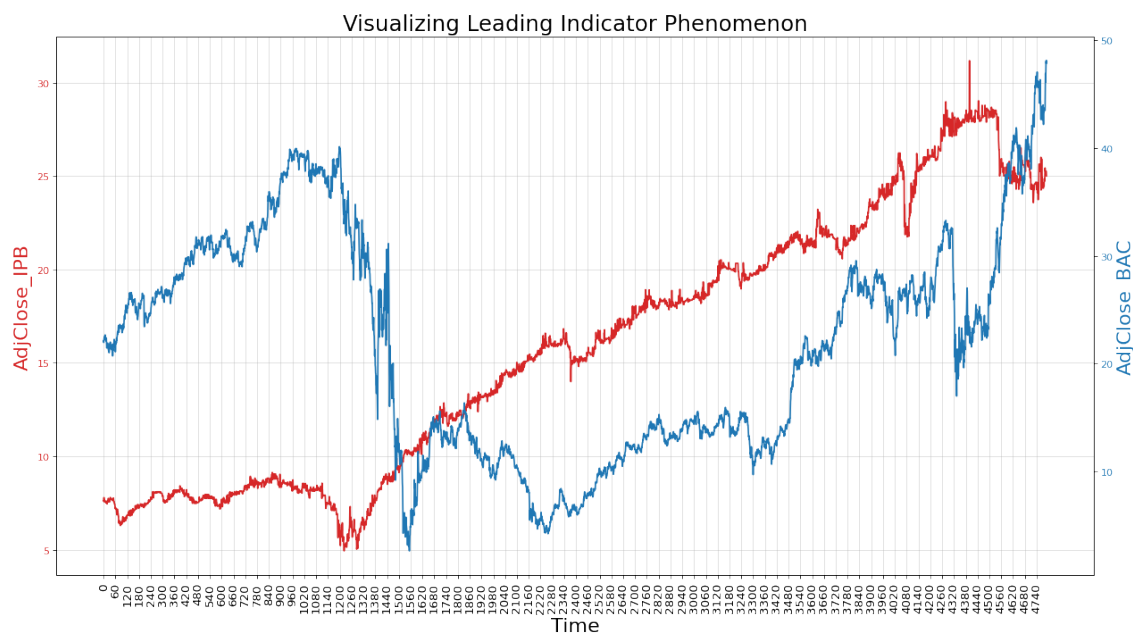


Figure 4.2 Granger Causality Analysis of Stock Price Behavior between IPB and BAC. Source: Google Finance

This is the result of the code on the top that represents the stock price behavior of the two banks taken into account in order to compute the Granger Causality Test. The red curve represents the behavior of the *AdjClose* value of the bank IPB from 2004 to 2023 and the blue one represents the behavior of the *AdjClose* value of the bank BAC from 2003 to 2023.

```

#!/usr/bin/env python
2 # coding: utf-8

4 # In [2]:

```

```

6 from statsmodels.tsa.stattools import grangercausalitytests
8 maxlag = 12
9 test = 'ssr_chi2test'
10 def grangers_causation_matrix(data, variables, test='ssr_chi2test',
11     verbose=False):
12     df = pd.DataFrame(np.zeros((len(variables), len(variables))),
13         columns=variables, index=variables)
14     for c in df.columns:
15         for r in df.index:
16             test_result = grangercausalitytests(data[[r, c]], maxlag=
17                 maxlag, verbose=False)
18             p_values = [round(test_result[i+1][0][test][1],4) for i in
19                 range(maxlag)]
20             if verbose: print(f'Y = {r}, X = {c}, P Values = {p_values}')
21         )
22         min_p_value = np.min(p_values)
23         df.loc[r, c] = min_p_value
24     df.columns = [var + '_x' for var in variables]
25     df.index = [var + '_y' for var in variables]
26     return df

```

```
grangers_causation_matrix(df1, variables = df.columns)
```

	AdjClose_IPB_x	AdjClose_BAC_x
AdjClose_IPB_y	1.0000	0.0766
AdjClose_BAC_y	0.0425	1.0000

Figure 4.3 Granger causality matrix

In the data frame, we have two columns, one for *AdjClose_{IPB}* and one for *AdjClose_{BAC}*. It is very important to notice the order of the two columns, in fact, in this case, it means that IPB is a granger caused by BAC. The result in Figure 4.4 obtained from the Granger causality test ($F=0.6969$ and $p=0.5538$ after 3 lags) means that there is no significant causal relationship between the two banks. The p-value ($p=0.5538$) represents the probability of observing the test statistic value ($F=0.6969$) under the null hypothesis, which states that changes in one bank are not significant predictors of changes in the other bank. Since the p-value is higher than the usual significance level of 0.05, it is not possible to reject the

```

from statsmodels.tsa.stattools import grangercausalitytests

#perform Granger-Causality test
grangercausalitytests(df[['AdjClose_IPB', 'AdjClose_BAC']], maxlag=[3])

Granger Causality
number of lags (no zero) 3
ssr based F test:      F=0.6969 , p=0.5538 , df_denom=4781, df_num=3
ssr based chi2 test:  chi2=2.0938 , p=0.5532 , df=3
likelihood ratio test: chi2=2.0933 , p=0.5533 , df=3
parameter F test:    F=0.6969 , p=0.5538 , df_denom=4781, df_num=3

{3: ({'ssr_ftest': (0.6969032984713365, 0.5538428533710046, 4781.0, 3),
      'ssr_chi2test': (2.093770964074938, 0.5531739673093548, 3),
      'lrtest': (2.0933132991594903, 0.5532667125519031, 3),
      'params_ftest': (0.6969032984715575, 0.5538428533707889, 4781.0, 3.0)},
  [<statsmodels.regression.linear_model.RegressionResultsWrapper at 0x1ce4a2a3e80>,
  <statsmodels.regression.linear_model.RegressionResultsWrapper at 0x1ce4a2a32b0>,
  array([[0., 0., 0., 1., 0., 0., 0.],
         [0., 0., 0., 0., 1., 0., 0.],
         [0., 0., 0., 0., 0., 1., 0.]])])}

```

Figure 4.4 Granger Causality Test Results for Two Banks: No Evidence of Causal Relationship

null hypothesis, and the conclusion is that there is no causal relationship between the two banks. The result shows a scarcity of statistically significant evidence linking changes in one bank to cause changes in the other bank. In this case, "changes" and "cause changes" refer respectively to the changes in BAC's "AdjClose" value causing changes in the stock prices of IPB both prior to and after its acquisition. It is also important to mention that there are numerous other methods for examining the Granger causality in this merger, and this chapter aims to emphasize the significance and potential uses of this analysis.

5

Enforcement policy respecting bank merger in the US by BPI

The enforcement policy respecting bank merger in the US by the Bureau of Prisons and Institutions (BPI) is a regulatory measure aimed at ensuring the stability and safety of the financial sector. This policy outlines the rules and procedures that banks must follow when merging with other financial institutions. It also provides guidelines for the BPI to monitor and enforce these rules, with the goal of preventing potential harm to consumers and maintaining a healthy financial system. The enforcement policy is an important tool for promoting transparency and accountability in the banking industry and helps to protect the interests of consumers, investors, and the economy as a whole. For over half a century, Congress has been working to improve the banking industry for the benefit of customers and the economy. In response to the demand for more efficient, effective, and convenient banking services, Congress lifted geographical restrictions that had previously fragmented the industry. Historically, banks faced two main restrictions on their expansion imposed by Congress and various state governments. The first restriction was on the bank itself, while the second was on affiliated banks. The assessment of the legality of bank mergers has been gradually developed over time by the Department of Justice (DoJ) and Federal Bank Regulators, under the guidance of individuals appointed by both Democratic and Republican Administrations. The approach is based on the expertise and professionalism of career staff who analyze the situation. This approach complies with the relevant laws and legal precedents and focuses on the potential harm to local markets, as well as the requirement to divest branches in any market where competition might be impacted. Over the years and through the evaluation of hundreds of mergers, DoJ and Federal Bank Regulators have refined their approach to accommodate the changes brought by various laws passed by Congress aimed at addressing the fragmented banking system and facilitating the creation of branch networks that customers depend on. The antitrust analysis process is not static, but changes should only be made to reflect actual shifts in the competitive landscape. This is crucial to

ensure that the analysis is guided by the rule of law, rather than being subject to the personal opinions of those in charge of relevant agencies. Maintaining this approach is also essential for fostering a strong and thriving economy, as it provides consistency and predictability in government actions. It is important to note that most bank mergers involve the community and mid-sized banks, with the majority of these mergers being between two such banks. The reasons for these mergers vary, including the need for growth, diversification through expansion in geography or products, and changes in ownership. Any changes in antitrust policies that make bank mergers more difficult could unfairly impact the community and mid-sized banks. Later that year, the Assistant Attorney General in charge of the Antitrust Division gave a speech highlighting the importance of the Bank Merger Guidelines in promoting competitive banking markets and providing clarity to the business community.

Conclusions

In conclusion, this thesis has explored the concept of bank mergers and the enforcement policy surrounding them. The Italian banking system consolidation case was examined to shed light on the current state of bank mergers in Italy. The Bank of America Merrill Lynch case was used to study the causal effect of M&A on the banking industry. Finally, the enforcement policy regarding bank mergers in the US by BPI was discussed to demonstrate the different approaches taken by different countries. Overall, this thesis has provided a comprehensive overview of bank mergers and the enforcement policies that govern them. It has shown that the impact of M&A on the banking industry can be complex and multifaceted and that different countries have different approaches to regulating these transactions. It is hoped that this research will contribute to a deeper understanding of the subject and provide useful insights for future studies.

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