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All that Glitters is Not Gold! Could M&As Post-Bank Reforms be Just a Tool for Balance Sheet Embellishment?

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This study investigates whether the surge of mergers and acquisitions (M&As) that occurred in Italy after the enactment, in 2016, of a new reform of credit cooperative banks (CCBs) ultimately improved their performance. Worldwide, CCBs have proved to play a crucial role in spurring local economic development. With the adoption of a dataset composed of 594 Italian banks and 3933 bank-year observations from 2008 to 2020, our results show a positive and significant impact of the 2016 reform on M&As among CCBs. However, contrary to the expectations of regulators, our results highlight a puzzling deterioration in bank stability of the CCBs involved in M&As, with no relevant improvement in capitalization and profitability, reinforcing the view that bigger is not always better, at least in the context of CCBs. Our evidence sheds light on the perils underlying a massive consolidation process of local banking industries, calling for a regulatory recalibration and further research investigating the impact of different growth models capable of preserving the diversity and unique characteristics of banks, rather than pursuing a 'one-size-fits-all' model.

Introduction

Our study contributes to the ongoing debate about the potential risks associated with intense consolidation processes among local banks (Barra and Ruggiero, 2022; Coccorese and Ferri, 2020). Such consolidations have frequently been promoted by regulators and policymakers worldwide to strengthen financial systems, often opting for a 'one-size-fits-all' approach (Barone, 2018; Barra, Papaccio and Ruggiero, 2022; Blanco-Oliver, 2021; Blankson *et al.*, 2022; Duygun, Ladley and Shaban, 2020; Engelen *et al.*, 2020).

In line with these global trends, the Italian Parliament recently introduced a radical reform (Law 49/2016) impacting the entire credit cooperative bank (CCB) system (the 2016 reform), aimed at increasing the stability, efficiency, and profitability of CCBs (Barra and Ruggiero, 2021; Bruno *et al.*, 2018; Coccorese and Santucci, 2020; Coccorese and Shaffer, 2021; Karafolas, 2016). This reform was particularly recommended to strengthen CCBs under the expectation that greater consolidation would lead to increased capitalization and performance through the exploitation of higher size, synergies, and economies of scale (Beccalli, Rossi and Viola, 2023; Collevecchio *et al.*, 2024; Darayseh and Alsharari, 2023; Marchionne *et al.*, 2022; Viola, 2023). Specifically, this reform introduced a new vertically integrated organizational model, creating cooperative bank groups and delegating various intervention powers to their holding companies (Beccalli, Rossi and Viola, 2023). Although such reform did not explicitly require CCBs to merge, it may have pressured them to do so in order to achieve greater size, enhance financial solidity, and limit the external control imposed on riskier CCBs. Consequently, the reform may have indirectly contributed to the abnormal and unprecedented wave of mergers and acquisitions (M&As) among CCBs, as observed after its announcement.

Historically, M&As have been widely recognized as a crucial tool for promoting growth, firm restructuring, and business diversification (Aryanitis and Stucki, 2014; Cumming *et al.*, 2023; DeLong and DeYoung, 2007; Galariotis *et al.*, 2021; Mehta, Srinivasan and Zhao, 2020). However, poorly judged mergers, carried out without adequately considering the 'human side' (Jensen, 1986; Morck, Shleifer and Vishny, 1990;

Sarala *et al.*, 2016), can generate adverse effects (Cole, Johan and Schweizer, 2021; Cumming, Johan and Tarsalewska, 2020), especially in local banks, compromising their lending activities towards small businesses (Berger *et al.*, 1998; Del Prete *et al.*, 2022; Fonteyne, 2007; Jagtiania, Kotliar and Maingi, 2016) and their bank–firm relationships (Potì and Wang, 2023). Moreover, rushed M&A decisions, driven more by reform compliance than strategic objectives, and without properly considering managerial and structural implications, may exacerbate the adverse effects of mergers (Cumming and Zambelli, 2013).

Despite the positive intentions of Italian regulators, the 2016 reform was criticized for its potential negative impact on the unique operating model and distinctive features of CCBs, based on mutualism and localism (Migliorelli and Lamarque, 2022). There were concerns that excessive consolidation of CCBs could undermine their commitment to serving marginal borrowers, diluting their local focus and altering their lending approach, rooted in long-lasting fiduciary relationships with clients (Agostino, Ruberto and Trivieri, 2023; Algeri, Forgione and Migliardo, 2023; Coccorese *et al.*, 2016; Hessou and Lai, 2018; Montgomery, 2022). Other concerns focused on the risk of increasing credit rationing, especially towards retail customers and small businesses (Barone, 2018; Coccorese and Santucci, 2020). Moreover, high consolidation would inevitably reduce the number of small local institutions, potentially compromising banking diversity – a crucial characteristic for a resilient banking system (Barboni and Rossi, 2019; Coccorese and Shaffer, 2021). This criticism raised questions about whether the reform's goals of enhancing bank capitalization came at the cost of compromising the original roots and foundational principles of CCBs. Investigating these trade-offs is crucial for assessing the real impact and overall efficacy of the 2016 reform.

Very few studies have empirically investigated the effects of the 2016 reform or the potential drawbacks underlying significant consolidation processes in the context of CCBs (Beccalli, Rossi and Viola, 2023; Coccorese and Shaffer, 2021). While some studies have analysed specific effects of M&As among CCBs, a comprehensive and 'holistic' assessment remains lacking (Viola, 2023). For example, Coccorese and Ferri (2020) examined M&As that occurred among CCBs before the 2016 reform enactment (from 1993 to 2013) and found no evidence of post-merger efficiency gains, concluding that the preceding wave of M&As probably 'wasn't worth a dime'. Beccalli, Rossi and Viola (2023) took a different perspective, focusing on the organizational restructuring imposed by the 2016 reform, showing improved economies of scale and scope for the involved CCBs.

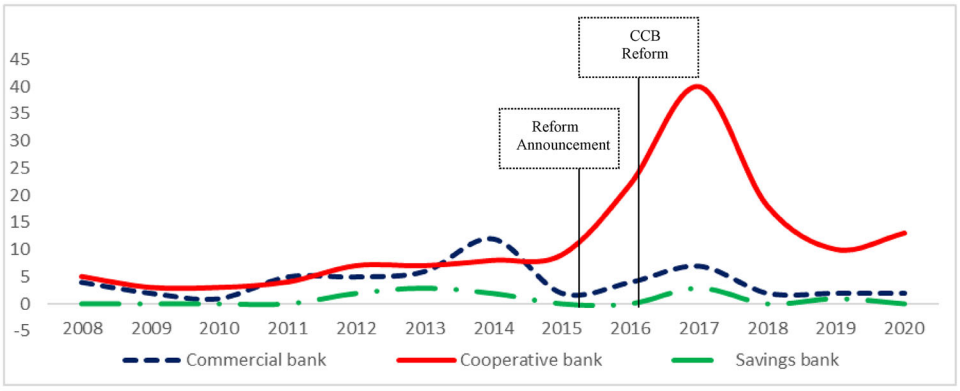
However, no prior studies have investigated the 2016 reform with a multi-faceted approach. We intend to contribute to filling this gap by assessing the effects of M&As among CCBs over the 2008–2020 period, and considering multiple performance dimensions: capitalization, efficiency, profitability, and risk. Specifically, our purpose is twofold: (a) to analyse the direct impact of the 2016 reform on the abnormal wave of M&As among CCBs observed over 2015–2018 (Figure 1) and (b) to assess its indirect impact in terms of M&A outcomes for the involved CCBs.

In line with previous studies on CCBs, our analysis is country-specific and focuses on Italy (e.g. Barra and Ruggiero, 2023; Coccorese and Ferri, 2020; Huhtilainen, Saastamoinen and Suhonen, 2022; Yamori and Harimaya, 2022). Investigating the relationship between bank reforms and M&As at a country level is crucial given the peculiar characteristics of CCBs in each specific geographical context (Altintas, Ferrari and Girardone, 2022; Blanco-Oliver, 2021; Blankson *et al.*, 2022). Italy represents an interesting case study for several reasons. First, it is one of the European countries with the longest tradition of cooperative banks. Second, the values underlying the cooperative lending activity are well rooted in the Italian context since its constitution, which officially recognizes the social mission of cooperation (Catturani and Stefani, 2016; Crovini, Ossola and Giovando, 2018). Third, CCBs have played a crucial role in supporting small and medium enterprises (Agostino, Ruberto and Trivieri, 2023), and have proved to be more stable than commercial banks, even in times of crises (Hesse and Cihak, 2007). Fourth, the 2016 reform altered the Italian financial landscape, leading to unforeseen market dynamics that raised concerns about its efficacy and requiring further in-depth investigation.

Our study employs a novel dataset consisting of 3933 bank-year observations from 2008 to 2020, with detailed financial information on 594 Italian banks. To investigate the overall efficacy of the CCB reform with a multidimensional performance framework, we employ a difference-in-differences (DID) approach in combination with a propensity score matching (PSM) method. In line with the expectations of policymakers, our findings show a positive and significant impact of the 2016 reform on M&As. However, all that glitters is not gold. Contrary to the legislator's intentions, our results highlight a puzzling deterioration in the stability of merged CCBs, with no significant improvement in their capitalization and performance, further reinforcing the findings of Coccorese and Ferri (2020). Our findings remain robust across a range of additional tests, confirming the validity of our main results.

This paper is organized as follows. The next two sections discuss the institutional and theoretical background. Thereafter, we describe our sample and research design, followed by a discussion of the 2016 reform's effects on M&As and their impact on bank performance. The last two sections present additional robustness tests and provide concluding remarks.

Panel A: M&As across Bank Types (in terms of No. of deals): 2008-2020



Panel B: Annual Percentage Change in the Number of CCBs over time: 2008-2020

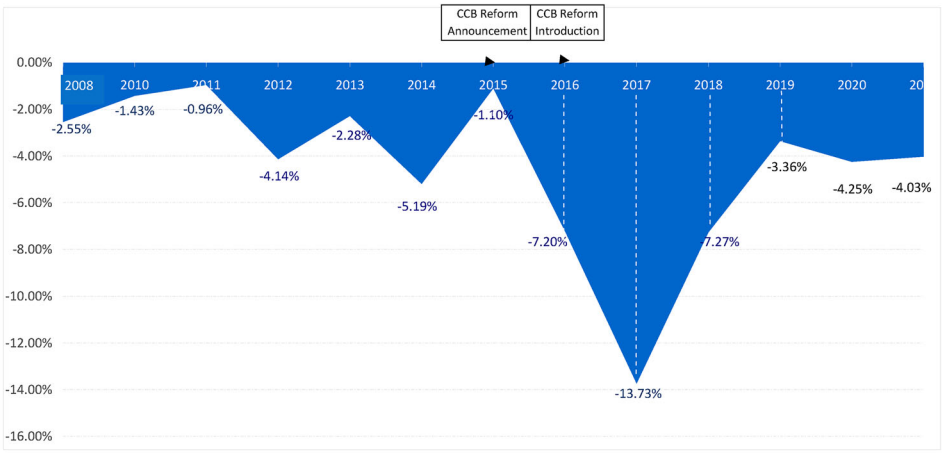


Figure 1. M&A dynamics and cooperative banks in Italy. Panel A shows the distribution of M&A activities across different types of banks (cooperative, savings, and commercial banks) before and after the announcement and issuance of the 2016 reform of CCBs. Prior to its announcement in 2015, the number of M&As exhibited similar patterns across all types of banks. Afterwards, the bank industry experienced an abnormal and unprecedented wave of M&As among CCBs, especially condensed over the 2015–2018 period. Panel B shows the evolution of the CCB number over time, in terms of annual percentage change, before and after the announcement of the CCB regulatory change. Consistent with the exceptional increase of M&As among CCBs seen from 2015 to 2018, the number of such types of banks decreased dramatically during the same periods (reaching a 13.73% reduction in 2017), highlighting an exceptional and condensed consolidation process of CCBs, never seen before. Sources*: Panel A, our dataset; Panel B, Bank of Italy.*

Italian cooperative banks and institutional setting: A literature review

CCBs are well rooted in many countries around the world, especially in Europe (Castellò, Trias and Arribas, 2018; Migliorelli and Lamarque, 2022). CCBs are member-owned, not-for-profit financial intermediaries, primarily aimed at achieving mutualistic and social objectives for the benefit of their customers, who can become members of the cooperative and play an active role in its governance (Barra and Ruggiero, 2022; Coccorese and Shaffer, 2021). Differently from shareholder-based commercial banks, CCBs are usually small-scale banks (Algeri, Forgione and Migliardo, 2022; Coccorese and Ferri, 2020) aimed at maximizing the value-added for their local stakeholders by serving the financing needs of the area in which they operate (Barone, 2018; Butzbach and Rotondo, 2020; Karafolas, 2016; Marchionne *et al.*, 2022; McKillop *et al.*, 2020; Migliorelli, 2018).

Within this context, the Italian CCB model is recognized as one of the most representative in Europe as its original foundational principles have remained unchanged over time, since its establishment in the late nineteenth century (Castellò, Trias and Arribas, 2018). The unique operating model of CCBs, based on mutualism and localism, has promoted the financial inclusion of marginal borrowers and helped local firms access financial resources to support their growth, ultimately reducing credit rationing towards local communities (Agostino, Ruberto and Trivieri, 2023).

The literature has highlighted numerous unique characteristics of CCBs. First, they adopt an operating model based on local focus, a long-lasting relationship lending approach (due to their geographical proximity

to customers) and a prevailing service activity (mutualistic purpose) towards members (Algeri, Forgione and Migliardo, 2022; Angelini, Di Salvo and Ferri, 1998; Coccorese and Ferri, 2020; Fiordelisi *et al.*, 2023; Migliorelli, 2018).[1] Such an operating model has proved to facilitate the flow of soft information helping CCBs better handle adverse selection problems (Barboni and Rossi, 2019; Barra, Papaccio and Ruggiero, 2022). Second, CCBs must allocate at least 70% of their profits to legal reserves, which by law cannot be distributed. This rule has helped CCBs increase their capitalization levels over time (Coccorese *et al.*, 2016). Third, the CCB governance model is based on the democratic participation of members in the decision-making process: each member has only one vote regardless of the shares held (Bruno and Iacoviello, 2020; Crovini, Ossola and Giovando, 2018).

Historically, Italian CCBs have played a crucial role in supporting small industries, promoting innovation of local businesses (Barra and Ruggiero, 2022), and facilitating lending to households and small to medium enterprises (SMEs) even during the most challenging periods of the global financial crisis (Agostino, Ruberto and Trivieri, 2023; Algeri, Forgione and Migliardo, 2022; Barone, 2018; Becchetti, Ciciretti and Paolantonio, 2016; Coccorese and Santucci, 2020; McKillop *et al.*, 2020). During times of crisis, CCBs proved to be more resilient than conventional banks and outperformed them (Barboni and Rossi, 2019; Catturani and Stefani, 2016).

Despite such evidence, policymakers have raised concerns about their localism, small size, simplified operations, and high fragmentation (the 'too many-too little' view), which could limit cooperative banks' capacity to properly handle the risks of new systemic shocks and increased competition, potentially destabilizing the entire financial system (Coccorese and Ferri, 2020; Coccorese and Santucci, 2020; Gobbi and Lotti, 2004). Furthermore, the distinctive governance model of CCBs (based on the 'one head-one vote' principle), was criticized for its potential to increase agency costs by weakening member control, thereby reducing their incentives for rigorous monitoring. This, in turn, could increase the opportunities for managers to engage in discretionary spending and opportunistic behaviours (Catturani and Stefani, 2016; McKillop *et al.*, 2020). For these reasons, in 2016 the Italian legislator intervened with a radical reform of CCBs to promote greater stability, as well as minimize cases of mismanagement and opaque lending (Cecchini Manara and Sacconi, 2019; Marchionne *et al.*, 2022).

Starting from 2015, the Italian CCB industry has experienced an unprecedented surge in M&As, unlike other types of banks. While the number of M&As involving other types of banks has remained relatively stable over time, the number of M&As among CCBs has increased dramatically over a short time period (Figure 1). This trend peaked in 2017 and may be connected to the recent legal reform of CCBs, which was announced in 2015 and enacted in 2016. Although the reform did not explicitly require CCBs to merge, it may have indirectly influenced industry dynamics by pushing CCBs to consolidate, as a means to increase their size and hopefully become more efficient and financially stronger.

As depicted in Figure, the 2016 reform marked an important turning point for the Italian banking industry by imposing a drastic change in the organizational model of CCBs (Barone, 2018). Previously, CCBs operated under a network structure model, which was based on the 'cooperation among cooperatives' principle (McKillop *et al.*, 2020). This model involved the establishment of dense networks of branches, allowing individual CCBs to receive support, assistance and advisory services from local and national federations while maintaining their full independence. Subsequent to the 2016 reform, a new vertically integrated organizational model was introduced (Beccalli, Rossi and Viola, 2023; Viola, 2023), by requesting CCBs to choose between two options: either (a) join a larger cooperative banking group, whose parent company operates as a joint-stock company with various coordination and control powers over the participating CCBs (by virtue of a 'cohesion contract') or (b) convert into a stock company (way-out option). Membership with a larger banking group became mandatory to maintain cooperative status. Those CCBs that did not intend to adhere to a cooperative group were forced to change their nature, giving up their cooperative model. Following the reform, almost all CCBs joined a banking group, choosing between the BCC ICCREA Group and the Cassa Centrale Group.

Theoretical background and hypotheses

Various studies show that the regulatory pressure to increase stability can act as a powerful driver for M&A activities (e.g. Cumming and Zambelli, 2013; Harada, 2018; Lang and Welzel, 1999; McAlevey, Sibbald and Tripe, 2010; Sibbald and Mcalevey, 2003). The 2016 reform reduced the independence of CCBs due to their obligation to join a cooperative banking group. Subsequent to the reform, the independence of CCBs was made contingent on their risk and performance levels. Once they joined a cooperative group, participating CCBs became subject to periodical assessments by

[1] By law, 51% of the risk activities must be devoted to members and 95% of loans must be granted within the local catchment area (Catturani and Stefani, 2016).

the holding company (Marchionne *et al.*, 2022). It is plausible that the 2016 reform pushed banks to merge to improve their performance before joining a cooperative group, thereby avoiding an excessive reduction in their autonomy. Considering the above evidence and the governance implications underlying cooperative banking groups, we expect that the 2016 reform would significantly encourage a consolidation process within the cooperative system, spurring M&As – especially among weaker banks – in an effort to reduce risks and preserve a higher level of autonomy. Therefore, we conjecture the following:

H1: The 2016 reform increases the number of M&A deals among CCBs.

Despite the mixed evidence on M&As and bank performance (see e.g. Beccalli and Frantz, 2009; Cartwright and Schoenberg, 2006; Papadakis and Thanos, 2010), higher consolidation processes can lead to greater economies of scale and scope, which could be beneficial for CCB performance as it would reduce costs and increase efficiency (Beccalli, Rossi and Viola, 2023; Focarelli and Panetta, 2003). M&As also lead to greater diversification, which in turn reduces risk and improves risk-adjusted performance (see e.g. Cumming *et al.*, 2023). From this perspective, M&As could help weaker banks increase their profitability thanks to the exploitation of higher network externalities and economies of scale, as well as higher market power, which would lead to significant cost savings and revenue increases. Furthermore, M&As have been specifically recommended by supervisory authorities as a means to increase the capitalization of the banks involved (International Monetary Fund, 2010). As shown in Beccalli and Frantz (2013), banks with lower capitalization are more likely to be involved in M&As, as the desire to improve capital levels is one of the main drivers motivating merger transactions in banking. This can be particularly beneficial for CCBs. In case of capital shortage, CCBs have limited possibilities of improving capitalization compared to larger and listed banks: they can either increase the number of members or retain earnings. From this perspective, consolidation activities among CCBs could help them increase their capital through larger synergies and economies of scale (Bai, Jin and Serfling, 2022; Wheelock and Wilson, 2011). This, in turn, could lead to higher efficiency, with a positive impact on their profitability (Goddard, McKillop and Wilson, 2014; McKillop *et al.*, 2020). Driven by the above literature, we assume the following:

H2: M&As among CCBs produce a positive impact on their capitalization and economic performance.

Previous studies have shown that size and market share matter for bank stability and risk management activities (e.g. Berger *et al.*, 1998; Goddard, McKillop and Wilson, 2014). With reference to the Italian cooperative banking system, Maggiolini and Mistrulli (2005) highlight the existence of an inverse relationship between the market share of CCBs and the probability of failure. Other studies show that smaller banks appear to be more exposed to default risk (Goddard, McKillop and Wilson, 2014). From this perspective, consolidation measures could provide a solution to improve the stability of financial systems (Castellò, Trias and Arribas, 2018), increasing opportunities for business diversification and enhancing bank capabilities to better absorb potential shocks, thereby improving their survival likelihood (Fonteyne, 2007). Consolidation processes via M&As can also help the newly combined entities spread fixed costs over a larger output, reducing excessive expenditure and increasing bank survival (Bindal *et al.*, 2020). For small CCBs, this can be particularly beneficial, given the existence of high compliance costs tied to regulatory requirements (Hughes *et al.*, 2019).

M&As can enhance survival probabilities and strengthen bank stability in at least three ways: (a) by increasing market share and market power, potentially resulting in higher revenues (Maggiolini and Mistrulli, 2005); (b) by enhancing efficiency through economies of scale and scope, which in turn can reduce costs and increase profitability (Beccalli, Rossi and Viola, 2023); and (c) by reducing bank risk through the 'clean-up' activity of riskier assets on the balance sheets, often undertaken before the completion of M&As, resulting in a decrease in impaired loans for the acquired banks (Bruno *et al.*, 2018; Focarelli and Panetta, 2003). Driven by the above evidence, we conjecture the following:

H3: M&As among CCBs produce a positive impact on their risk and stability.

Data and research design

To test our hypotheses, we collected a novel dataset by employing various primary sources. First, we considered all Italian banks included in Orbis Bank Focus by Bureau van Dijk, which is a worldwide database of banks with information collected from various sources (annual reports, information providers and regulatory sources). From this first step, we collected detailed information on 594 banks, for a total of 6338 bank-year observations, over the 2008–2020 period. Second, we integrated our database with information on the M&A deals that occurred in Italy over the above period from Orbis M&A (previously named Zephyr). This database, sourced by Bureau van Dijk, includes information on M&As, initial public offerings, as well as venture capital deals around the world. From this second step, we

collected information on 438 M&As. Third, from Bank Focus we collected the financial statements of all banks included in our sample, limiting it to the bank-year observations for which financial statements were available from 2008 to 2020. Fourth, we integrated our dataset with macroeconomic data collected from the World Bank Data Warehouse (GDP, Bank Assets Concentration and Domestic Credit to Private Sector over GDP).[2]

Our ultimate dataset consists of 3933 bank-year observations from 2008 to 2020, and includes 594 Italian banks: 114 commercial banks, 39 savings banks and 441 CCBs.[3] Our dataset also includes detailed information on 214 M&A transactions and 161 acquirers.

Table 1 describes our dataset and provides summary statistics for the main variables employed in our analyses. Panel A shows the distribution of the different types of banks in our dataset. Panel B provides summary statistics for the key variables, while Panel C focuses specifically on the subset of CCBs.

The main variables are described in Online Appendix SA1 and summarized as follows, in line with Coccorese and Ferri (2020), Ayadi *et al.* (2021), Coccorese and Shaffer (2021), Beccalli, Rossi and Viola (2023) and Viola (2023): *bank capitalization*, measured as the ratio between equity and total assets (EQUITY/TA); *capital adequacy*, measured as the ratio between the Tier 1 capital and risk-weighted assets (RWA); *bank stability*, captured by the winsorized Z-score, measured as the sum of bank capitalization (EQUITY/TA) and return on assets (ROA), over the standard deviation of ROA, computed by considering the entire sample period, in line with Barra and Ruggiero (2023); *bank risk appetite*, captured by the risk-weighted asset density (RWA_DENSITY), measured as the ratio between RWA and total assets; *return on assets* (ROA), measured as the ratio between income before taxes and total assets; *risk-adjusted profitability*, or return on risk-weighted assets (RO_RWA), measured as the ratio between income before taxes and RWA; *cost-to-income ratio*, measured as the winsorized ratio between operating expenses and operating income (COST/INCOME); *bank's capacity to absorb loan losses*, in terms of loan loss provisions ratio (LLP ratio), measured as loan loss provisions (LLP) over gross loans (GL); *bank business model*, measured as GL over total assets (TA); *credit portfolio quality*, captured by the proportion of non-performing loan (NPL) over GL; *credit expansion*, captured by the growth in GL (GROWTH_GROSS_LOANS), measured as the annual percentage change of customer loans; *bank size*, measured as the natural logarithm of total assets.

We also considered other control variables: type of bank (commercial, cooperative, or savings bank); M&A dummy; M&A involvement as acquirer; listed banks; bank asset concentration; bank system development; 2016 reform dummy.

Comparison of means and medians

In Table 2 we focus on M&As and compare banks involved in M&As with banks not involved in M&As over the 2008–2020 period. Part 1 shows the difference in means tests for the total sample (Panel A) and the CCB subsample (Panel B). Part 2 shows the difference in medians tests for the entire sample of banks (Panel C) and the CCB subsample (Panel D).

Banks involved in M&As show a bigger size (in line with the European Central Bank, 2021) and, surprisingly, a lower capitalization, in terms of regulatory capital (TIER 1) and equity-to-assets ratios, both in terms of mean and median differences, which are highly significant at the 1% level (Table 2). Moreover, banks involved in M&As show a significantly lower Z-score, suggesting lower bank stability and higher riskiness. By looking at the medians, banks involved in M&As show lower profitability in terms of ROA and risk-adjusted return (this puzzling evidence is especially relevant for the CCB subsample in Panel D). Furthermore, banks involved in M&As are more oriented to lending activities (in terms of higher gross loans-over-assets ratio and gross loans growth) compared to other banks not involved in M&As.

Overall, the increase in the riskiness of CCBs involved in M&As is puzzling as it highlights the exact opposite of what the regulator would have expected with the introduction of the 2016 reform. This surprising result requires further investigation in a multivariate context, as described in the following sections.

Methodology

Our study focuses on two closely related research objectives: (a) evaluating the direct impact of the 2016 reform on M&A activities and (b) evaluating the indirect impact of such reform by assessing the outcomes of the M&As that occurred among CCBs.

To evaluate the impact of the 2016 reform on M&As, we adopt a DID methodology applied to our entire sample of banks, in line with Srivastav and Vallascas (2022), Beccalli, Rossi and Viola (2023) and Potì

[2]See https://databank.worldbank.org/home.aspx.

[3]Classifications are taken from Orbis Bank Focus. Consistent with Beccalli, Rossi and Viola (2023), our dataset excludes the period from 2021 to 2023 to avoid confounding effects driven by recent market events (i.e. the COVID-19 pandemic; the increase in inflation and interest rates) and other regulatory changes outside the scope of our study, which would introduce noise into our analyses due to their inevitable impact on bank balance sheets, as highlighted by Claessens, Coleman and Donnelly (2018), Molyneux *et al.* (2022) and Bats, Giuliodori and Houben (2023). See also Marchionne *et al.* (2022).

Table 1. Descriptive statistics

Panel A: Distribution by types of banks (in terms of number of banks included in our total sample)

	Commercial	Savings	CCBs	TOTAL
N. banks	114	39	441	594
N. bank-year observations	763	218	2952	3933

Panel B: Total sample focus

	N	Mean	Median	SD	Min	Max	p25	p75
EQUITY/TA	3932	0.106	0.089	0.086	−0.104	0.992	0.070	0.121
TIER 1 RATIO	3821	0.190	0.164	0.114	−0.081	2.590	0.130	0.216
Z-SCORE_W	3889	66.339	45.245	60.371	6.808	194.15	16.708	96.684
RWA_DENSITY	3702	0.527	0.512	0.160	0.000	2.018	0.428	0.612
ROA	3932	0.001	0.002	0.021	−0.447	0.579	0.001	0.005
RO_RWA	3702	0.006	0.005	0.271	−0.600	16.381	0.001	0.009
COST/INCOME_W	3924	0.680	0.678	0.112	0.504	0.869	0.596	0.759
LL_PROVISION	3893	0.013	0.009	0.018	−0.260	0.442	0.004	0.016
GROSS LOANS/TA	3911	0.652	0.666	0.177	0.000	1.147	0.557	0.775
NPL RATIO	3844	0.139	0.119	0.102	0.000	2.336	0.066	0.196
GROWTH GROSS LOANS	2882	0.062	0.041	0.377	−15.599	0.949	−0.009	0.123
SIZE	3933	13.569	13.337	1.787	7.583	20.768	12.367	14.448
BANK ASSET CONCENTRATION	3933	0.661	0.700	0.076	0.516	0.738	0.571	0.726
PRIVATE CREDIT TO GDP	3933	0.849	0.849	0.058	0.743	0.941	0.808	0.886
GDP GROWTH	2908	0.002	0.008	0.015	−0.053	0.017	0.000	0.013

Panel C: CCBs focus

	N	Mean	Median	SD	Min	Max	p25	p75
EQUITY/TA	2951	0.105	0.091	0.066	−0.064	0.983	0.074	0.122
TIER 1 RATIO	2872	0.191	0.170	0.102	−0.081	2.590	0.138	0.218
Z-SCORE_W	2920	74.186	54.293	62.776	6.808	194.15	21.184	110.993
RWA_DENSITY	2797	0.533	0.516	0.137	0.046	1.121	0.438	0.614
ROA	2951	0.001	0.002	0.013	−0.138	0.448	0.001	0.005
RO_RWA	2797	0.003	0.005	0.017	−0.353	0.064	0.002	0.009
COST/INCOME_W	2949	0.674	0.675	0.106	0.504	0.869	0.595	0.749
LL_PROVISION	2927	0.013	0.009	0.014	−0.009	0.223	0.004	0.016
GROSS LOANS/TA	2938	0.654	0.663	0.147	0.000	0.987	0.566	0.764
NPL RATIO	2906	0.139	0.123	0.085	0.000	0.548	0.072	0.197
GROWTH GROSS LOANS	2157	0.077	0.044	0.133	−1.030	0.845	−0.004	0.126
SIZE	2952	13.183	13.131	1.432	7.583	18.947	12.266	13.889
BANK ASSET CONCENTRATION	2952	0.661	0.700	0.077	0.516	0.738	0.571	0.726
PRIVATE CREDIT TO GDP	2952	0.847	0.849	0.057	0.743	0.941	0.808	0.886
GDP GROWTH	2175	0.003	0.008	0.015	−0.053	0.017	0.004	0.013

Note: This table reports the descriptive statistics of our main variables. Panel A shows the bank distribution in terms of type. Panel B describes the total sample of banks. Panel C focuses on the subsample of CCBs. EQUITY/TA is the ratio between equity and total assets; TIER-1 RATIO is the ratio between the Tier 1 capital and risk-weighted assets; Z-SCORE_W is the winsorized ratio between the sum of bank capitalization (EQUITY/TA) plus return on assets (ROA), divided by the standard deviation of ROA; RWA_DENSITY is the ratio between risk-weighted assets and total assets; ROA is the return over total assets ratio; RO_RWA is the return on risk-weighted assets; COST/INCOME is the winsorized ratio between operating expenses and operating income; LL_PROVISIONS is the ratio between loan loss provisions and gross loans; GROSS LOANS/TA is the ratio between gross customer loans over total assets; NPL RATIO is the ratio between non-performing loans and gross customer loans; GROWTH_GROSS LOANS is the annual percentage change of customer loans; SIZE is the natural logarithm of total assets. The table also includes various country-level controls, as defined in Online Appendix SA1.

and Wang (2023). To this end, the DID methodology is appropriate as it compares outcome changes, before and after a specific treatment (the CCB reform), between a treated group (CCBs) and a control group. Thereafter, to evaluate the outcome of M&As on bank performance, we focus on CCBs and employ a PSM methodology, in line with Abadie and Imbens (2006), Caliendo and Kopeinig (2008), Casu *et al.* (2013) and Ayadi *et al.* (2021).[4] Specifically, we proceed in two main steps.

[4]For our second objective, we focus on CCBs, as they are the only type of bank specifically targeted by the 2016 reform. PSM is more suitable in this case as it matches treated and control groups based on covariates, which helps to control for confounding factors and allows us to properly consider the effect of multiple M&As implemented by the same banks. Specifically,

Table 2. Comparison of means and medians tests

Part 1: Difference in means (split sample)					
Panel A: Total sample focus					
	No M&A		M&A		T-test
	N	Mean	N	Mean	Sign
EQUITY/TA	3718	0.107	214	0.087	***
TIER 1 RATIO	3608	0.192	213	0.146	***
Z-SCORE_W	3676	67.415	213	47.765	***
RWA DENSITY	3528	0.528	174	0.515	
ROA	3718	0.001	214	−0.001	
RO_RWA	3528	0.007	174	−0.002	
COST/INCOME_W	3711	0.680	213	0.673	
LL_PROVISIONS	3681	0.013	212	0.012	
GROSS LOANS/TA	3698	0.649	213	0.701	***
NPL RATIO	3632	0.138	212	0.155	**
GROWTH GROSS LOANS	2704	0.054	178	0.184	***
SIZE	3719	13.458	214	15.493	***
Panel B: CCBs focus					
	No M&A		M&A		T-test
	N	Mean	N	Mean	Sign
EQUITY/TA	2802	0.105	149	0.087	***
TIER 1 RATIO	2724	0.193	148	0.149	***
Z-SCORE_W	2771	75.247	149	54.445	***
RWA DENSITY	2674	0.534	123	0.506	**
ROA	2802	0.001	149	0.00	*
RO_RWA	2674	0.003	123	0.00	*
COST/INCOME_W	2801	0.687	148	0.679	
LL_PROVISIONS	2779	0.013	148	0.012	
GROSS LOANS/TA	2790	0.651	148	0.705	***
NPL RATIO	2758	0.138	148	0.156	**
GROWTH GROSS LOANS	2030	0.067	127	0.243	***
SIZE	2803	13.09	149	14.928	***
Part 2: Difference in medians (split sample)					
Panel C: Total sample focus					
	No M&A		M&A		
	N	Median	N	Median	Wilcoxon Mann−Whitney
EQUITY_TA	3718	0.090	214	0.078	***
TIER 1 RATIO	3608	0.166	213	0.144	***
Z-SCORE_W	3676	46.029	213	30.348	***
RWA DENSITY	3528	0.513	174	0.506	
ROA	3718	0.002	214	0.002	***
RO RWA	3528	0.005	174	0.004	**
COST/INCOME_W	3711	0.679	213	0.666	
LL PROVISIONS	3681	0.009	212	0.009	
GROSS LOANS/TA	3698	0.663	213	0.709	***
NPL RATIO	3632	0.117	212	0.143	***
GROWTH GROSS LOANS	2704	0.040	178	0.157	***
SIZE	3719	13.268	214	14.823	***

Table 2. (Continued)

Panel D: CCBs focus

	No M&A		M&A		
	N	Median	N	Median	Wilcoxon Mann−Whitney
EQUITY_TA	2802	0.092	149	0.079	***
TIER 1 RATIO	2724	0.171	148	0.149	***
Z-SCORE_W	2771	55.483	149	34.081	***
RWA DENSITY	2674	0.517	123	0.502	*
ROA	2802	0.002	149	0.002	***
RO RWA	2674	0.005	123	0.003	***
COST/INCOME_W	2801	0.676	148	0.672	
LL PROVISIONS	2779	0.009	148	0.009	
GROSS LOANS/TA	2790	0.659	148	0.714	***
NPL RATIO	2758	0.121	148	0.147	***
GROWTH GROSS LOANS	2030	0.041	127	0.257	***
SIZE	2803	13.063	149	14.314	***

Note: This table reports the differences in means and medians tests, comparing the group of bank-year observations without M&As with the group of bank-year observations with M&As, with reference to the entire sample period. Part 1 shows the difference in means tests. Part 2 shows the difference in medians tests. Panels A and C focus on the total sample of commercial, savings and cooperative banks. Panels B and D focus only on CCBs. Variables: EQUITY/TA is the ratio between equity and total assets; TIER-1 RATIO is the ratio between the Tier 1 capital and risk-weighted assets; Z-SCORE_W is the winsorized ratio between the sum of bank capitalization (EQUITY/TA) plus return on assets (ROA), divided by the standard deviation of ROA; RWA_DENSITY is the ratio between risk-weighted assets and total assets; ROA is the return over total assets ratio; RO_RWA is the return on risk-weighted assets; COST/INCOME_W is the winsorized ratio between operating expenses and operating income; LL PPROVISIONS is the ratio between loan loss provisions and gross loans; GROSS LOANS/TA is the ratio between gross customer loans over total assets; NPL RATIO is non-performing loans over gross customer loans; GROWTH_GROSS_LOANS is the annual percentage change of customer loans; SIZE is the natural logarithm of total assets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

As a first step, we focus on our entire sample of banks and employ a DID method to evaluate the effects of the reform on M&As, before and after the 2016 regulatory change (the treatment). Given that only CCBs have been targeted by this reform, the treated group is represented by the CCBs sample, while the other banks in our dataset (commercial and savings banks) serve as a control group, as they have not been impacted by the 2016 reform. To implement the DID method, we consider two time periods: the period before the CCB reform and the period after. The regression model used in this first step estimates the M&A involvement according to the following equation:

$$Y_{i,t} = a_i + \beta(TIME)t + \tau(TREATED)_{i,t} + \delta(TIME_t * TREATED_{i,t}) + \sum_{k=1}^{k} \lambda(\Omega)_{\mathrm{ki,t-1}} + \varepsilon_{i,t} \quad (1)$$

where: i refers to our main unit of observation and t represents time; $Y_{i,t}$ indicates the M&A dummy variable, which equals 1 when the bank is involved in an M&A and 0 otherwise; $TIME_t$ is a dummy variable related to the post-treatment period (in our case, TIME represents the period subsequent to the introduction of the 2016 reform, from 2017 to 2020); $TREATED_{i,t}$ is a dummy variable indicating whether a bank was hit by the regulatory change (in our sample, the treated group is represented by CCBs); TIME * TREATED is the interaction term, which takes value 1 for the CCB observations after the regulatory change, and 0 otherwise. Moreover, Ω is the vector of control variables related to banks and macroeconomic variables, as described in the previous section. The bank variables and macroeconomic variables are taken at time t–1.[5]

After the completion of the DID analysis applied to our entire sample of banks, as a second step, we focus on our subsample of CCBs, as they represent the only type of bank specifically targeted by the 2016 reform, and employ a PSM method to investigate the impact of M&As on the performance of the CCBs involved. In this second step, the treatment is represented by the M&A involvement in a certain year, and the treated group is composed of the CCBs engaged in an M&A

in this second part, for each year we compare CCBs that are involved in an M&A deal with those that are not. Since some CCBs have been involved in more than one M&A (as shown by Coccorese and Ferri, 2020), PSM allows us to capture this aspect, as the M&A dummy (treatment) is equal to 1 only in the year of the M&A involvement (and not in other years). Instead, the DID methodology, while robust, would not fully account for this complexity, as it would treat all banks involved in M&As the same, whether they had one or multiple deals, and would not allow us to appropriately differentiate between banks involved in more than one M&A deal.

[5]We implemented the DID approach using a linear probability model (LPM), logit, and probit. For the logit and probit, we applied a non-linear transformation (ϕ) to the right-hand side of Equation (1).

in the same year. Given that the M&A implementation generally derives from a strategic decision taken by the board of directors, in our analyses, the M&A involvement may suffer from endogenous problems. To address such endogeneity issues and the underlying potential sample selection bias, we use the PSM method, in line with Ayadi *et al.* (2021). The PSM approach helps us reduce the selection bias that may be present in non-experimental data, as its ultimate goal is to create a 'pseudo' randomized controlled trial from observational data by matching treated and control units with a similar propensity to receive a treatment (or propensity score). To apply PSM to our case, we first estimate the probability of being treated (i.e. being involved in an M&A deal in a certain year), given a set of observed characteristics taken at time t–1. Afterwards, we evaluate the related outcomes in terms of CCB performance: capitalization, efficiency, risk, and stability.[6] Furthermore, driven by the evidence of Antón *et al.* (2022), we consider the role of acquirers and analyse consolidated balance sheets to evaluate the impact of M&As on the performance of banks involved as acquirers. This analysis allows us to better distinguish the post-merger effects, reinforcing the robustness of our results.

Multivariate analyses

Impact of the 2016 reform

In Table 3, we report the results related to the determinants of M&As in Italy, with the aim of highlighting the impact of the 2016 CCB reform (i.e. the treatment) on M&A deals. In particular, in Table 3 we consider the entire sample and employ a DID method (Equation (1)) by comparing the cooperative banks (treated group) with commercial and savings banks (control group), before and after the 2016 regulatory change. Specifically, we consider three types of models with various specifications: LPM (Models 1–3); probit (Models 4–6); and logit (Models 7–9). For each type of model, we include specifications with bank-specific variables only (Models 1, 4, 7), as well as specifications with additional macroeconomic variables (Models 2, 5, 8). Furthermore, in Models 3, 6, and 9 we have included region dummies. In all models, the dependent variable is the M&A implementation and the key explanatory variables are: TIME (dummy variable representing the period after the introduction of the CCB reform); TREATED (dummy variable representing CCBs); TIME * TREATED (interaction term, representing CCBs after the 2016 reform).[7]

As shown in Table 3, the 2016 reform (TIME) is positively associated with the M&A involvement, and this effect is highly significant in all models, suggesting that the 2016 reform significantly spurred the consolidation process among banks (from 4.7% in Model 4 to 7.6% in Model 6). As expected, the impact on M&As is significantly stronger for cooperative banks (TREATED group), in line with H1. For example, in Models 4–9, CCBs have around a 6% higher probability of being involved in an M&A, relative to the other types of banks. Similarly, our key variable of interest (TIME * TREATED) always shows a highly significant and positive association with M&A involvement, highlighting that the 2016 reform significantly increased the M&As among CCBs, from 6.1% (in Model 4) to 9.8% (in Model 9), compared to the control group. The LPM results (Models 1–3) further confirm the significant increase in the M&As among CCBs after the regulatory reform. Overall, our findings in Table 3 suggest that the 2016 reform produced a substantial change in the merger behaviour of CCBs.[8]

Regarding the other control variables, our results show that banks with higher lending activity, in terms of GL, tend to be more involved in M&As. Similarly, banks with higher NPLs implement more M&As, probably due to the credit portfolio restructuring that usually occurs before completing these types of deal, as shown by Bruno *et al.* (2018). Also, bigger banks tend to be more involved in M&As, probably because of their desire to reduce competition while increasing economies of scale and market power, in line with the evidence of Hannan and Pilloff (2009) and the European Central Bank (2021).[9] Furthermore, our results show that M&As are more likely to occur when the banking systems are less concentrated and more developed, consistent with Cumming *et al.* (2023).

CCB focus

In this section, we focus on CCBs, as they are the only type of bank directly targeted by the 2016 reform, as shown in Table 3. Given the substantial impact of this

[6]In experimental studies, the potential sample selection bias is addressed by using a random assignment of individuals to the treated group (Jalan and Ravallion, 2003), while in non-experimental studies, as is our case, such bias is addressed by employing the PSM method, consistent with Caliendo and Kopeinig (2008). One of the main advantages of using PSM is that the underlying propensity scores can reduce the problem of estimating the treatment effects with multiple covariates to a single-dimensional problem, in which the set of covariates is summarized in a single score. This greatly simplifies the matching process used to estimate treatment effects (Jalan and Ravallion, 2003). For details on the application of the PSM procedure to our case, see the Online Appendix (2).

[7]The correlation matrix is reported in Online Appendix SA2.

[8]As shown in Figure 1, following the CCB reform, the number of M&As increased significantly more among CCBs than other types of banks, especially after its announcement in 2015. Conversely, before 2015 the number of M&As exhibited similar patterns (parallel trends) across all types of banks.

[9]See Huhtilainen, Saastamoinen and Suhonen (2022) for a recent review of studies on the link between size and M&As.

Table 3. Impact of CCB reform on M&As (focus: total sample)

Dependent variable: M&A involvement (Focus: Total sample)	(1) LPM	(2) LPM	(3) LPM	(4) PROBIT	(5) PROBIT	(6) PROBIT	(7) LOGIT	(8) LOGIT	(9) LOGIT
TIME (2016 reform)	0.0320***	0.0750***	0.0746***	0.047***	0.072***	0.076***	0.047***	0.071***	0.075***
	(0.0110)	(0.0211)	(0.0211)	(0.005)	(0.014)	(0.014)	(0.005)	(0.015)	(0.015)
TREATED (CCBs)	0.0667***	0.0654***	0.0611***	0.060***	0.060***	0.061**	0.065***	0.064***	0.066***
	(0.0145)	(0.0144)	(0.0152)	(0.006)	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)
TIME * TREATED	0.0611***	0.0589***	0.0582***	0.061***	0.091**	0.093***	0.064***	0.096***	0.098***
(CCBs after 2016 reform)	(0.0199)	(0.0200)	(0.0201)	(0.006)	(0.015)	(0.016)	(0.007)	(0.018)	(0.018)
EQUITY/TA	0.322***	0.316***	0.307***	0.038	0.060	0.045	0.031	0.053	0.038
	(0.0997)	(0.100)	(0.104)	(0.099)	(0.094)	(0.108)	(0.099)	(0.091)	(0.111)
RWA_DENSITY	−0.0478	−0.0512	−0.0687**	−0.046	−0.053*	−0.055*	−0.041	−0.044	−0.045
	(0.0317)	(0.0319)	(0.0348)	(0.029)	(0.030)	(0.032)	(0.030)	(0.030)	(0.034)
GROSS LOANS/TA	0.0297	0.0412	0.0435	0.097***	0.108***	0.123***	0.113***	0.117***	0.129***
	(0.0294)	(0.0291)	(0.0307)	(0.028)	(0.028)	(0.031)	(0.223)	(0.029)	(0.033)
NPL RATIO	0.233***	0.219***	0.227***	0.247***	0.230***	0.235***	0.223***	0.206***	0.216***
	(0.0481)	(0.0481)	(0.0549)	(0.044)	(0.046)	(0.048)	(0.042)	(0.044)	(0.047)
GROWTH_GROSS LOANS	0.0525	0.0529	0.0518	0.265***	0.270***	0.287***	0.292***	0.289***	0.307***
	(0.0355)	(0.0363)	(0.0368)	(0.035)	(0.034)	(0.035)	(0.032)	(0.031)	(0.033)
SIZE	0.0315***	0.0309***	0.0313***	0.026***	0.025***	0.026***	0.027***	0.026***	0.027***
	(0.00434)	(0.00433)	(0.00461)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
BANK ASSET_ CONCENTRATION		−0.234***	−0.219**		−0.269***	−0.287***		−0.283**	−0.283*
		(0.0895)	(0.0881)		(0.097)	(0.098)		(0.110)	(0.110)
DOMESTIC CREDIT_GDP		0.349***	0.358***		0.410***	0.452***		0.433***	0.463**
		(0.135)	(0.138)		(0.141)	(0.146)		(0.160)	(0.165)
GDP_GROWTH		−0.263	−0.239		.0.388	−0.408		−0.346	−0.377
		(0.344)	(0.344)		(0.330)	(0.348)		(0.322)	(0.347)
LISTED	0.0130	0.0132	0.0246	−0.005	−0.004	0.008	−0.012	−0.011	0.001
	(0.0306)	(0.0306)	(0.0318)	(0.018)	(0.018)	(0.020)	(0.449)	(0.018)	(0.021)
Constant	−0.514***	−0.663***	−0.669***	−8.061***	−10.36***	−10.67***	−17.06***	−21.92***	−22.35***
	(0.0657)	(0.130)	(0.130)	(0.790)	(1.550)	(1.567)	(1.645)	(3.292)	(3.388)
REGION FE	No	No	Yes	No	No	Yes	No	No	Yes
Observations	2691	2691	2691	2691	2691	2554	2691	2691	2554
R-squared/pseudo R-squared	0.065	0.068	0.073	0.2555	0.2669	0.2777	0.264	0.2756	0.2858

Note: This table reports the impact of the CCB reform (introduced in 2016) on M&A deals by adopting the difference-in-differences methodology. The dependent variable in all models is M&A involvement. Models 1–3 employ a linear probability model (LPM); Models 4–6 employ a probit model, while Models 7–9 use a logit model (probit and logit models show marginal effects). Models 1, 4, and 7 include only bank-specific variables. Models 2, 5, and 8 add macroeconomic variables. Models 3, 6, and 9 add region fixed effects. The key variables are: TIME, a dummy variable representing the post-reform period (i.e. after the enactment of the 2016 CCB reform), taking value 1 over the period after the regulatory change, and 0 otherwise; TREATED, a dummy variable equalling 1 if the bank is a cooperative bank (CCB), and 0 otherwise; (TIME * TREATED), the related interaction term, which takes value 1 for CCBs after the 2016 reform, and 0 otherwise. The other explanatory variables are: bank capitalization, as the ratio between equity and total assets (EQUITY/TA); bank risk appetite, proxied by the risk-weighted assets over total assets ratio (RWA DENSITY); bank business model, proxied by the ratio between the gross loans and total assets (GROSS LOANS/TA); credit portfolio quality, measured as the ratio between the non-performing loans over gross loans (NPL RATIO); bank lending activity, measured as the annual percentage change of gross loans (GROWTH GROSS LOANS); bank size, measured as the natural logarithm of total assets (SIZE); LISTED status of banks, proxied by a dummy variable equalling 1 if the bank is listed, and 0 otherwise. We also controlled for macroeconomic indicators: bank asset concentration, measured as a share of the assets of the five largest banks, over total commercial banking assets (BANK ASSET CONCENTRATION); bank system development, measured as the ratio between domestic credit to the private sector and GDP (DOMESTIC CREDIT_GDP); economic growth, measured as the annual growth of GDP (GDP_GROWTH). All bank-specific variables and macroeconomic variables are considered at time t−1. Robust standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. For Models 1–3, the mean VIF is 1.66, 2.33, and 2.23, respectively, while the max VIF is 2.41, 5.78, and 5.80, respectively.

regulatory change on the merger behaviour of CCBs, we now assess the outcomes of the M&As among them by employing a PSM approach to estimate the effects of M&A involvement (treatment) on the performance of the involved CCBs with reference to various outcomes (capitalization, stability, profitability, efficiency, and cost of risk) and different time periods (from the year before the M&A up to 2 years after, in line with Ayadi *et al.*, 2021).[10] The results are reported in Table 4, in terms of average effect on the treated (ATET). Specif-

[10]Specifically, we considered the year preceding the M&As (t–1), as board decisions and preparatory changes often occur the year before the merger, as shown by Bruno *et al.* (2018). We also considered 1 year (t+1) and 2 years post-deal (t+2) to capture both immediate and medium-term effects, following Ayadi *et al.* (2021), since M&As often take up to 2 years to fully mani-

Table 4. Effects of M&As on capitalization, stability, risk, and performance (focus: CCB sample)

ATET: M&A involvement (focus: CCB sample)								
Panel A: Capitalization								
Propensity score matching	ΔTIER 1 ratio				ΔEQUITY/TA			
Model specifications	Model 1 TIER 1 (t; t+1)	Model 2 TIER 1 (t; t+2)	Model 3 TIER 1 (t–1; t+1)	Model 4 TIER 1 (t–1; t+2)	Model 5 E/A (t; t+1)	Model 6 E/A (t; t+2)	Model 7 E/A (t–1; t+1)	Model 8 E/A (t–1; t+2)
M&A	−0.002	−0.001	0.007	0.022	−0.001	−0.012	0.009	0.001
(ATET)	[0.003]	[0.008]	[0.011]	[0.021]	[0.002]	[0.008]	[0.09]	[0.017]
No. observations	1345	974	1346	976	1365	994	1365	994
Panel B: Stability and risk								
Propensity score matching	ΔZ-SCORE_winsorized				ΔRWA_DENSITY			
Model specifications	Model 9 ZSCORE_W (t; t+1)	Model 10 ZSCORE_W (t; t+2)	Model 11 ZSCORE_W (t−1; t+1)	Model 12 ZSCORE_W (t−1; t+2)	Model 13 RWA (t; t+1)	Model 14 RWA (t; t+2)	Model 15 RWA (t−1; t+1)	Model 16 RWA (t−1; t+2)
M&A	−3.334***	−5.181***	−4.936***	−5.435***	0.003	0.024	−0.012	0.017
(ATET)	[1.121]	[1.513]	[1.554]	[1.942]	[0.009]	[0.026]	[0.017]	[0.039]
No. observations	1365	994	1365	994	1286	1301	910	926
Panel C: Profitability								
Propensity score matching	ΔROA				ΔRO_RWA			
Model specifications	Model 17 ROA (t; t+1)	Model 18 ROA (t; t+2)	Model 19 ROA (t−1; t+1)	Model 20 ROA (t−1; t+2)	Model 21 RO_RWA (t; t+1)	Model 22 RO_RWA (t; t+2)	Model 23 RO_RWA (t−1; t+1)	Model 24 RO_RWA (t−1; t+2)
M&A	−0.002*	−0.005	−0.002	−0.003	−0.005***	−0.009	−0.007	−0.003**
(ATET)	[0.001]	[0.004]	[0.001]	[0.003]	[0.001]	[0.009]	[0.006]	[0.001]
No. observations	1345	994	1365	994	1286	910	1301	926
Panel D: Cost-to-income ratio and cost of risk								
Propensity score matching	ΔCOST/INCOME_winsorized				ΔLLP ratio			
Model specifications	Model 25 C/I_W (t; t+1)	Model 26 C/I_W (t; t+2)	Model 27 C/I_W (t−1; t+1)	Model 28 C/I_W (t−1; t+2)	Model 29 LLP (t; t+1)	Model 30 LLP (t; t+2)	Model 31 LLP (t−1; t+1)	Model 32 LLP (t−1; t+2)
M&A	0.002	0.030***	−0.009	0.011	−0.003**	−0.004***	−0.002	−0.004
(ATET)	[0.009]	[0.010]	[0.017]	[0.018]	[0.001]	[0.001]	[0.002]	[0.003]
No. observations	1365	993	1365	993	1362	989	1361	988

Note: This table reports the outcomes of the M&A involvement (treatment) by employing a propensity score matching (PSM) methodology and focusing on the cooperative banks (CCBs) subsample. In particular, the table reports the results of the average effect on the treated (ATET) of the M&A involvement on the CCBs involved in the M&A transaction in a given year (TREATED group), in comparison to CCBs not involved in M&As in the same given year (CONTROL group), with reference to various types of outcomes (capitalization, stability, risk, and performance) and different time periods, from the year before the M&A (t–1), up to 2 years after (t+2). Specifically: Panel A refers to the impact on capitalization in terms of TIER 1 (Models 1–4) and EQUITY_TA (Models 5–8); Panel B refers to the impact on risk and stability in terms of winsorized Z-SCORE (Models 9–12) and RWA DENSITY (Models 13–16); Panel C reports the impact on profitability in terms of ROA (Models 17–20) and RO_RWA (Models 21–24); Panel D focuses on the winsorized COST/INCOME ratio (Models 25–28) as well as on the cost of risk in terms of LLP (Models 29–32). Within each panel, we consider the variation in the above outcomes over four different periods of time, reported in separate columns. Observable matching characteristics: E/TA; RWA ratio; GL/TA; NPL ratio; growth GL; SIZE; LISTED; bank assets concentration; domestic credit to GDP; GDP growth. As robustness tests, we also run the same regression specifications on the total capital ratio (TCR). Results remain materially unchanged and are available upon request. Robust standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

ically, for each year, we evaluate the outcomes of M&As carried out by the involved CCBs (treated group) compared to the outcomes of CCBs not involved in such transactions (control group).

One of the most important reasons underlying the 2016 reform was the improvement of capitalization and resilience of the banking system. Surprisingly, the results in Table 4 show that the CCBs involved in M&As did not significantly increase their capitalization, both in terms of the Tier 1 ratio and the equity-to-assets ratio (Panel A), showing no significant improvement across all time windows.

Even more surprising is the effect of M&As on bank stability, captured by the winsorized Z-score (Panel B). Contrary to the expectations of regulators, the CCBs involved in M&As show a significant deterioration of Z-score, suggesting a substantial increase in their default risk. This decrease in bank stability is significant at the 1% level for all the considered periods and is particularly relevant 2 years after the merger (Models 10, 12), resulting in a reduced Z-score of approximately 7% relative to the average Z-score of the CCBs sample.[11] Moreover, contrary to the legislator's intention, M&As did not translate into any significant improvement in the ROA of the involved CCBs (Models 17–20), and even had a relevant detrimental impact on their risk-adjusted profitability (RO_RWA), both in the short and long run (Models 21, 24), reflecting a reduced profitability of at least 100% relative to the average RO_RWA of the CCB sample (Model 24). A possible explanation for such reduction may be related to the significant increase in the COST/INCOME ratio observed 2 years after the merger (Panel D, Model 26), suggesting a surprising deterioration in the medium-term efficiency of the CCBs involved in M&As, probably due to higher post-merger integration costs, as shown in Harp and Barnes (2018). The findings in Panel D (Models 29, 30) also show an interesting reduction of 23%–31% in the cost of risk (loan loss provisions over gross loans) for merged CCBs, relative to the average LLP ratio, suggesting a relevant improvement in their credit portfolio quality. However, this improvement could also derive from balance sheet embellishment strategies, or 'cleaning activities' of the credit portfolio, which have been observed in the banking sector prior to the completion of M&As. For example, Bruno *et al.* (2018) show a significant reduction in NPLs of banks involved in M&As, highlighting a tendency for banks to optimize their financial statements before completing the merger by offloading problematic loans to specialized intermediaries, in order to show a healthier asset portfolio.

Additional analyses

To further investigate the effects of M&As on cooperative banks' performance, we now focus on acquirers. Since the acquirer's consolidated financial statements include the target's data, focusing on acquirers allows us to observe clearer post-merger effects. Specifically, we now limit our treated group to CCBs engaged *as acquirers* in M&As and, for each year, we compare them to the CCBs not involved in M&As or not involved *as acquirers* in M&As.

The results are reported in Table 5 and confirm our previous findings. First, acquirer CCBs do not show significant increases in capitalization levels, both in terms of Tier 1 ratio and equity-to-assets ratio (Panel A), compared to CCBs not involved in M&As (apart from one exception in Model 3). Second, acquirer banks show a significant decrease in their Z-score across all time windows, highlighting a substantial deterioration in their resilience and stability relative to the other banks not engaged in M&As (Panel B). Acquirers also display a highly significant decrease in their risk-adjusted profitability in the first year after the merger (Panel C, Model 21), as well as a significant increase in the cost-to-income ratio 2 years later, suggesting increased inefficiency (Model 26). Furthermore, the significant drop in the LLP ratio is confirmed for acquirers as well (Panel D, Models 29, 30 and 31).

Disentangling the Z-score

Given the surprising negative impact of M&As on bank stability, we proceed by disentangling the Z-score into its subcomponents, rerunning the PSM regressions on:

- the first component (ROA over standard deviation of ROA);
- the second component (bank capitalization over standard deviation of ROA).

The results are reported in Table 6. In Panel A, we focus on the overall effects of M&A involvement, while in Panel B we analyse the effects for acquirers. While there are no significant differences in terms of the first component of the Z-score, we observe a relevant and statistically significant decrease in the second component, especially in the long run (Models 6–8 in Panels A and B). Overall, our results reinforce the detrimental impact of M&As on the capitalization levels of involved CCBs.[12]

fest their impacts (see e.g. Ayadi *et al.*, 2021; Beccalli, Rossi and Viola, 2023; Bianconi and Tan, 2019; Cumming and Zambelli, 2017).

[11]For example, given that in Model 10 the ATET coefficient is −5.181 and the mean value of the winsorized Z-score for CCBs is 74.186, this translates into a decreased Z-score of 6.98% (–5.181/74.186).

[12]In Table 6, the denominator of the Z-score is computed by considering the entire sample period. As robustness checks, we

Table 5. Effects of M&As on capitalization, stability, risk, and performance of banks involved as acquirers *(focus: CCB sample)*

ATET: M&A involvement (CCB sample) as acquirers								
Panel A: Capitalization								
PSM	ΔTIER 1 ratio				ΔEQUITY/TA			
Model specifications	Model 1 TIER 1 (t; t+1)	Model 2 TIER 1 (t; t+2)	Model 3 TIER 1 (t−1; t+1)	Model 4 TIER 1 (t−1; t+2)	Model 5 E/A (t; t+1)	Model 6 E/A (t; t+2)	Model 7 E/A (t−1; t+1)	Model 8 E/A (t−1; t+2)
M&A (ATET)	0.000	−0.000	0.014**	0.011	−0.005	−0.005	0.005	0.007
	[0.003]	[0.009]	[0.006]	[0.019]	[0.005]	[0.003]	[0.004]	[0.015]
No. observations	1345	974	1346	976	1365	994	1365	994
Panel B: Stability and risk								
PSM	ΔZ-SCORE_winsorized				ΔRWA density			
Model specifications	Model 9 ZSCORE_W (t; t+1)	Model 10 ZSCORE_W (t; t+2)	Model 11 ZSCORE_W (t−1; t+1)	Model 12 ZSCORE_W (t−1; t+2)	Model 13 RWA (t; t+1)	Model 14 RWA (t; t+2)	Model 15 RWA (t−1; t+1)	Model 16 RWA (t−1; t+2)
M&A (ATET)	−3.523***	−4.416***	−5.070***	−5.142**	0.002	0.022	−0.019	0.003
	[1.156]	[1.608]	[1.952]	[2.308]	[0.009]	[0.025]	[0.018]	[0.035]
No. observations	1365	994	1365	994	1286	1301	910	926
Panel C: Profitability								
PSM	ΔROA				ΔRO_RWA			
Model specifications	Model 17 ROA (t; t+1)	Model 18 ROA (t; t+2)	Model 19 ROA (t−1; t+1)	Model 20 ROA (t−1; t+2)	Model 21 RO_RWA (t; t+1)	Model 22 RO_RWA (t; t+2)	Model 23 RO_RWA (t−1; t+1)	Model 24 RO_RWA (t−1; t+2)
M&A (ATET)	−0.001	−0.005	−0.001	−0.004	−0.005***	−0.009	−0.007	−0.003
	[0.002]	[0.004]	[0.002]	[0.003]	[0.001]	[0.009]	[0.006]	[0.002]
No. observations	1365	994	1365	994	1286	910	1301	926
Panel D: Cost-to-income ratio and cost of risk								
PSM	ΔCOST/INCOME_winsorized				ΔLLP ratio			
Model specifications	Model 25 C/I_W (t; t+1)	Model 26 C/I_W (t; t+2)	Model 27 C/I_W (t−1; t+1)	Model 28 C/I_W (t−1; t+2)	Model 29 LLP (t; t+1)	Model 30 LLP (t; t+2)	Model 31 LLP (t−1; t+1)	Model 32 LLP (t−1; t+2)
M&A (ATET)	−0.002	0.032***	−0.010	0.021	−0.003***	−0.004***	−0.002**	−0.004
	[0.012]	[0.011]	[0.019]	[0.021]	[0.001]	[0.001]	[0.001]	[0.003]
No. observations	1365	993	1365	993	1362	989	1361	!988

Note: This table reports the outcomes of the M&A involvement *as acquirers* (treatment), by employing a propensity score matching (PSM) methodology and focusing on the CCBs sample. In particular, the table reports the average effect on the treated (ATET) of M&As on the CCBs involved in the transaction *as acquirers* in a given year (TREATED group), in comparison to other CCBs not involved *as acquirers* or not involved in any M&As in the specific given year (CONTROL group), with reference to various types of outcomes (capitalization, stability, risk, and performance), as well as different time periods (windows), from the year before the M&A involvement (t–1), up to 2 years after (t+2). Specifically: Panel A refers to the impact on capitalization in terms of TIER 1 ratio (Models 1–4) and EQUITY_TA (Models 5–8); Panel B refers to the impact on risk and stability in terms of winsorized Z-SCORE (Models 9–12) and RWA DENSITY (Models 13–16); Panel C reports the impact on profitability in terms of ROA (Models 17–20) and RO_RWA (Models 21–24); Panel D focuses on the winsorized COST/INCOME ratio (Models 25–28) as well as on the cost of risk, in terms of LLP (Models 29–32). Within each panel, we consider the variation in the above outcomes over four different periods of time, reported in separate columns. Observable matching characteristics: E/TA; RWA ratio; GL/TA; NPL ratio; growth GL; SIZE; LISTED; bank assets concentration; domestic credit to GDP; GDP growth. Robust standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

also considered different computations of the Z-score denominator, including rolling windows of 4 and 5 years. Our main results (available upon request) remain confirmed.

Anticipation effects

To evaluate potential pre-trend effects and check the robustness of our main results, in Table 7 we assess the impact of the reform announcement on M&As by

Table 6. Disentangling the Z-score in its components: Effects of being involved in M&As (focus: CCB sample)

Panel A: ATET: M&A involvement (CCB sample)								
Propensity score matching	ΔZ-score first component				ΔZ-score second component			
	ROA_sdROA				EQUITY/TA_sdROA			
Model specifications	Model 1 ROA_sdROA (t; t+1)	Model 2 ROA_sdROA (t; t+2)	Model 3 ROA_sdROA (t–1; t+1)	Model 4 ROA_sdROA (t–1; t+2)	Model 5 EQUITY/TA_sdROA (t; t+1)	Model 6 EQUITY/TA_sdROA (t; t+2)	Model 7 EQUITY/TA_sdROA (t–1; t+1)	Model 8 EQUITY/TA_sdROA (t–1; t+2)
M&A	0.298	0.001	0.138	−0.025	−2.324*	−15.809**	−2.816	−14.926**
(ATET)	[0.220]	[0.174]	[0.209]	[0.234]	[1.392]	[7.661]	[2.004]	[7.552]
No. observations	1365	994	1365	994	1365	994	1365	994
Panel B: ATET: M&A involvement as acquirers (CCB sample)								
Propensity score matching	ΔZ-score first component: ROA_sdROA				ΔZ-score second component: EQUITY/TA_sdROA			
Model specifications	Model 1 ROA_sdROA (t; t+1)	Model 2 ROA_sdROA (t; t+2)	Model 3 ROA_sdROA (t−1; t+1)	Model 4 ROA_sdROA (t−1; t+2)	Model 5 EQUITY/TA_sdROA (t; t+1)	Model 6 EQUITY/TA_sdROA (t; t+2)	Model 7 EQUITY/TA_sdROA (t−1; t+1)	Model 8 EQUITY/TA_sdROA (t−1; t+2)
M&A	0.312*	0.050	0.192	−0.043	−7.093	−7.109***	−7.116	−6.452***
(ATET)	[0.156]	[0.190]	[0.186]	[0.159]	[5.559]	[2.694]	[5.890]	[2.256]
No. observations	1365	994	1365	994	1365	994	1365	994

Note: This table disentangles the Z-score ratio in its subcomponents (ROA over the standard deviation of ROA; equity/assets ratio over the standard deviation of ROA). The denominator is computed by considering the entire sample period. The table is composed of two panels. Panel A shows the impact of M&A involvement (treatment) on subcomponents of the Z-score by considering the PSM approach applied to the CCB sample. It reports the average effects of M&As on the CCBs involved in the transaction in a given year (TREATED group), in comparison to CCBs not involved in M&A deals in the specific year (CONTROL group), with reference to various types of outcomes, and different time periods, from the year before the M&A involvement (t–1), up to 2 years after (t+2). Panel B shows the impact of M&A involvement *as acquirers* (treatment) on the subcomponents of the Z-score by considering the PSM methodology applied to the CCB sample. It reports the average effects of M&As on the CCBs involved in the transaction *as acquirers* (TREATED group), in comparison to CCBs not involved *as acquirers* or not involved in M&As in the specific year (CONTROL group), with reference to various types of outcomes, and different time periods. For both panels: Models 1–4 report results about the first component of the Z-score (ROA_sdROA), while Models 5–8 report results about the second component of the Z-score (EQUITY/TA_sdROA). Robust standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 7. Announcement impact of CCB reform on M&As (in 2015): Total sample

Dependent variable: M&A Involvement (total sample)	(1) PROBIT (margins)	(2) PROBIT (margins)	(3) LOGIT (margins)	(4) LPM (no region FE)	(5) LPM (region FE)
TIME 2 (2015 announcement)	0.048***	0.048***	0.049***	0.018	0.016
	(0.004)	(0.005)	(0.004)	(0.021)	(0.021)
TREATED (CCBs)	0.060***	0.060***	0.064***	0.066***	0.062***
	(0.006)	(0.005)	(0.006)	(0.013)	(0.013)
TIME 2 * TREATED (CCBs after announcement)	0.065***	0.064***	0.069***	0.090***	0.089***
	(0.006)	(0.007)	(0.007)	(0.022)	(0.022)
EQUITY_TA	0.019	0.038	0.033	0.320***	0.314***
	(0.100)	(0.098)	(0.099)	(0.10)	(0.105)
RWA_DENSITY	−0.030	−0.039	−0.032	−0.052	−0.070*
	(0.029)	(0.029)	(0.030)	(0.033)	(0.037)
GROSS LOANS_TA	0.092***	0.112***	0.125***	0.045	0.048
	(0.026)	(0.028)	(0.029)	(0.031)	(0.033)
NPL_RATIO	0.251***	0.228***	0.200***	0.220***	0.228***
	(0.044)	(0.047)	(0.045)	(0.048)	(0.055)
GROWTH_GROSS LOANS	0.261***	0.273***	0.298***	0.055	0.054
	(0.033)	(0.034)	(0.031)	(0.036)	(0.037)
SIZE	0.027***	0.026***	0.027***	0.032***	0.032***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)
LISTED	−0.005	−0.003	−0.009	0.012	0.024
	(0.018)	(0.018)	(0.017)	(0.031)	(0.032)
BANK ASSET CONCENTRATION	–	−0.138*	−0.165**	−0.036	−0.027
		(0.081)	(0.077)	(0.093)	(0.095)
DOMESTIC CREDIT_GDP	–	0.127	0.145	6.98e-05	0.003
		(0.111)	(0.113)	(0.131)	(0.133)
GDP_GROWTH	–	0.266	0.179	0.532	0.563
		(0.365)	(0.352)	(0.345)	(0.351)
Constant				−0.49**	−0.49***
				(0.177)	(0.176)
REGION FE	NO	NO	NO	NO	YES
Observations	2691	2691	2691	2691	2691
Pseudo R-squared/R-squared	0.273	0.273	0.283	0.068	0.073

Note: This table reports the impact of the announcement of the CCB reform (made in 2015) on M&As, by adopting the difference-in-differences method with reference to the total sample. The dependent variable is M&A involvement. Model 1 uses probit and includes only bank-specific variables. Models 2, 3, and 4 add macroeconomic variables and use probit, logit, and linear probability models (LPM), respectively. Model 5 adds region fixed effects with LPM. The key variables are: TIME 2 considers the announcement year of the CCB reform and is a dummy variable equalling 1 from 2015 onwards, and 0 before; TREATED is a dummy variable equalling 1 if the bank is a CCB, and 0 otherwise; TIME 2 * TREATED is the related interaction term, which takes value 1 in case of CCBs from 2015 onward, and 0 otherwise. The other explanatory variables are: bank capitalization, measured as the ratio between equity and total assets (EQUITY/TA); bank risk appetite, proxied by the risk-weighted assets over total assets ratio (RWA DENSITY); bank business model, proxied by the ratio between the gross loans and total assets (GROSS LOANS/TA); credit portfolio quality, measured as the ratio between the non-performing loans over gross loans (NPL RATIO); bank lending activity, measured as the annual percentage change of gross loans (GROWTH GROSS LOANS); bank size, measured as the natural logarithm of total assets (SIZE); LISTED status of banks, proxied by a dummy variable equalling 1 if the bank is listed, and 0 otherwise. We also controlled for macroeconomic indicators: bank asset concentration, measured as a share of the assets of the five largest banks over total commercial banking assets; banking system development, measured as the ratio between the domestic credit and the private sector over GDP; economic growth, measured as the annual growth of GDP. All bank-specific and macroeconomic variables are considered at time t–1. Robust standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. For Models 4 and 5 the mean VIF is 2.29 and 2.22, respectively, while the max VIF is 6.52 and 6.60, respectively.

employing probit, logit and LPM models. Specifically, we rerun the main DID models reported in Table 3 with a different temporal dummy (TIME 2) to account for the year in which the reform was announced (2015). Our variable of interest is now represented by the interaction term (TIME 2 * TREATED), highlighting the CCBs (TREATED group) after the reform announcement. The results reported in Table 7 show a significant impact of such announcement on M&As. Both dummies (TIME 2 and its interaction term TIME 2 * TREATED), are positive and highly significant across all specifications, confirming that the 2016 reform substantially spurred M&A activities among CCBs, starting from its announcement (as also depicted in Figure 1).

Regional macroeconomic controls

To evaluate potential local differences, in Table 8 we reran our main DID models reported in Tables 3 and 7 by including regional macroeconomic indicators (i.e. *Regional GDP growth*, *Regional credit-to-GDP ratio,*

Table 8. Impact of CCB reform with regional macroeconomic controls (focus: total sample)

Panel A: Impact of 2016 reform

Dependent variable: M&A involvement (Focus: Total sample)	(1) LPM	(2) LPM	(3) PROBIT	(4) PROBIT	(5) LOGIT	(6) LOGIT
TIME (2016 reform)	0.037***	0.036***	0.048***	0.052***	0.048***	0.051***
	(0.012)	(0.013)	(0.005)	(0.006)	(0.005)	(0.006)
TREATED (CCBs)	0.069***	0.062***	0.062***	0.063**	0.067***	0.068***
	(0.015)	(0.015)	(0.006)	(0.005)	(0.006)	(0.006)
TIME * TREATED(CCBs after 2016 reform)	0.059***	0.058***	0.065***	0.065***	0.068***	0.069***
	(0.020)	(0.020)	(0.007)	(0.008)	(0.007)	(0.008)
EQUITY/TA	0.36***	0.331***	0.083	0.049	0.096	0.071
	(0.101)	(0.104)	(0.098)	(0.109)	(0.095)	(0.114)
RWA_DENSITY	−0.068**	−0.080**	−0.055*	−0.061*	−0.053*	−0.061*
	(0.034)	(0.036)	(0.030)	(0.032)	(0.031)	(0.036)
GROSS LOANS/TA	0.046	0.054	0.113***	0.136***	0.133***	0.155***
	(0.031)	(0.033)	(0.030)	(0.033)	(0.032)	(0.037)
NPL RATIO	0.225***	0.226***	0.224***	0.237***	0.197***	0.212***
	(0.051)	(0.057)	(0.046)	(0.051)	(0.045)	(0.052)
GROWTH_GROSS LOANS	0.053	0.051	0.269***	0.290***	0.295***	0.315***
	(0.036)	(0.036)	(0.035)	(0.036)	(0.033)	(0.033)
SIZE	0.031***	0.032***	0.027***	0.028***	0.028***	0.029***
	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)
REGIONAL MKT CONCENTRATION	−0.019**	−0.031**	−0.022*	−0.037***	−0.024*	−0.038**
	(0.009)	(0.012)	(0.009)	(0.012)	(0.010)	(0.014)
REGIONAL CREDIT/GDP	5.27e-05	3.00e-05	0.000	0.000	0.000	0.000
	(4.10e-05)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
REGIONAL GDP GROWTH	0.254*	0.229	0.275*	0.318*	0.298*	0.325*
	(0.131)	(0.143)	(0.123)	(0.136)	(0.126)	(0.140)
LISTED	0.014	0.025	−0.005	0.007	−0.013	0.001
	(0.031)	(0.032)	(0.018)	(0.020)	(0.018)	(0.021)
Constant	−0.529***	−0.521***	−8.445***	−8.860***	−18.040***	−18.607***
	(0.066)	(0.084)	(0.831)	(0.996)	(1.769)	(2.147)
REGION FE	NO	YES	NO	YES	NO	YES
Observations	2691	2691	2691	2554	2691	2554
R-squared/pseudo R-squared	0.067	0.074	0.264	0.2793	0.2747	0.2889

Panel B: Impact of the reform announcement (in 2015)

Dependent variable: M&A Involvement (total sample)	(1) LPM (no region FE)	(2) LPM (region FE)	(3) PROBIT (margins)	(4) LOGIT (margins)
TIME 2 (2015 announcement)	0.039***	0.026**	0.030***	0.049***
	(0.010)	(0.013)	(0.006)	(0.004)
TREATED (CCBs)	0.069***	0.063***	0.063***	0.067***
	(0.013)	(0.013)	(0.006)	(0.006)
TIME 2 * TREATED(CCBs after announcement)	0.092***	0.096***	0.068***	0.072***
	(0.022)	(0.023)	(0.006)	(0.006)
EQUITY_TA	0.347***	0.324***	0.065	0.080
	(0.100)	(0.104)	(0.098)	(0.097)
RWA_DENSITY	−0.059*	−0.069*	−0.036	−0.034
	(0.034)	(0.036)	(0.030)	(0.031)
GROSS LOANS_TA	0.055*	0.059*	0.109***	0.127***
	(0.031)	(0.032)	(0.028)	(0.030)
NPL_RATIO	0.207***	0.209***	0.222***	0.195***
	(0.050)	(0.055)	(0.046)	(0.044)
GROWTH_GROSS LOANS	0.056	0.054	0.265***	0.290***
	(0.036)	(0.036)	(0.033)	(0.031)
SIZE	0.032***	0.033***	0.028***	0.029***
	(0.004)	(0.005)	(0.004)	(0.004)
LISTED	0.012	0.023	−0.005	−0.011
	(0.031)	(0.032)	(0.018)	(0.018)
REGIONAL MKT CONCENTRATION	−0.019**	−0.032**	−0.022*	−0.024**
	(0.009)	(0.013)	(0.010)	(0.010)

Table 8. (Continued)

Panel B: Impact of the reform announcement (in 2015)				
Dependent variable: M&A Involvement (total sample)	(1) LPM (no region FE)	(2) LPM (region FE)	(3) PROBIT (margins)	(4) LOGIT (margins)
REGIONAL CREDIT/GDP	3.33e-05	−0.000	0.000	0.000
	(4.02e-05)	(0.000)	(0.000)	(0.000)
REGIONAL GDP GROWTH	0.227*	0.145	0.298**	0.331**
	(0.130)	(0.136)	(0.122)	(0.125)
Constant	−0.542***	−0.473***	−9.068***	−19.231***
	(0.066)	(0.091)	(0.872)	(1.782)
REGION FE	NO	YES	NO	NO
Observations	2691	2691	2691	2691
Pseudo R-squared/R-squared	0.069	0.076	0.277	0.287

Note: This table reports additional analyses on the impact of the 2016 reform (Panel A) and its announcement in 2015 (Panel B) on M&As, by adopting the difference-in-differences method and including regional macroeconomic variables (regional GDP annual growth, regional market concentration, regional credit to private sector). The dependent variable in both panels is M&A involvement. In Panel A, Models 1 and 2 employ a linear probability model (LPM); Models 3 and 4 employ a probit model, while Models 5 and 6 use a logit model (probit and logit models show marginal effects). Models 2, 4 and 6 also include region fixed effects. The key variables in Panel A are: TIME, a dummy variable representing the post-reform period (i.e. after the enactment of the 2016 CCB reform), taking value 1 over the period after the regulatory change, and 0 otherwise; TREATED, a dummy variable equalling 1 if the bank is a cooperative bank (CCB), and 0 otherwise; TIME * TREATED, the related interaction term, which takes value 1 for CCBs after the 2016 reform, and 0 otherwise. In Panel B, Models 1 and 2 use LPM, Models 3 and 4 employ probit and logit, respectively. Model 2 also adds region fixed effects. The key variables in Panel B are: TIME 2 considers the announcement year of the CCB reform and is a dummy variable equalling 1 from 2015 onwards, and 0 before; TREATED is a dummy variable equalling 1 if the bank is a CCB, and 0 otherwise; TIME 2 * TREATED is the related interaction term, which takes value 1 in case of CCBs from 2015 onwards, and 0 otherwise. For both panels, the other explanatory variables are: bank capitalization, as the ratio between equity and total assets (EQUITY/TA); bank risk appetite, proxied by the risk-weighted assets over total assets ratio (RWA DENSITY); bank business model, proxied by the ratio between the gross loans and total assets (GROSS LOANS/TA); credit portfolio quality, measured as the ratio between the non-performing loans over gross loans (NPL RATIO); bank lending activity, measured as the annual percentage change of gross loans (GROWTH GROSS LOANS); bank size, measured as the natural logarithm of total assets (SIZE); LISTED status of banks, proxied by a dummy variable equalling 1 if the bank is listed, and 0 otherwise. Regional macroeconomic indicators include: regional market concentration, measured by the Herfindahl Hirshmen Index considering the share of cooperative bank loans over total bank loans, both computed at the regional level (REGIONAL MKT CONCENTRATION); bank system development, proxied by the regional credit-to-GDP ratio, measured as the ratio between regional bank loans and regional GDP (REGIONAL CREDIT/GDP); economic growth, measured as the regional GDP annual growth (REGIONAL GDP GROWTH). All bank-specific variables and macroeconomic variables are considered at time t−1. For both Panels, Robust standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. For Panel A: In Models 1 and 2, the mean VIF is 1.66 and 1.67, respectively, while the max VIF is 2.41 and 2.42, respectively. For Panel B: In Models 1 and 2, the mean VIF is 1.62 and 2.12, respectively, while the max VIF is 2.04 and 11.98, respectively.

and *Regional market concentration*), considering specifications with and without region fixed effects (definitions are reported in Online Appendix SA1). The results in Table 8 further confirm the significant impact of the 2016 reform (Panel A) and its announcement (Panel B) in spurring M&As among CCBs.

Robustness tests

To further evaluate the robustness of our main results, we implement various additional tests. Within our main DID model, we first conduct two placebo tests. Second, we implement a dynamic DID analysis to evaluate the evolution of the treatment effect over time. Third, we consider further LPM specifications, including two-way fixed effects. Fourth, we consider a triple DID approach combined with a PSM method. The results are reported in Online Appendices SA3–SA5 and confirm the robustness of our main findings, as briefly discussed below.[13]

As highlighted by Mehta, Srinivasan and Zhao (2020), the placebo analysis allows controlling for possible anticipatory effects to make sure that our findings are not driven purely by our underlying research design. To this end, we imagine a fake introduction of the CCB reform two and three years before its actual issuance and consider two hypothetical treatment dates (placebo years): 2013 and 2014. Results are shown in Appendix SA3. In Models 1–4, we include PLACEBO 1, taking value 1 from 2014 to 2020 and 0 otherwise, while in Models 5–8, we include PLACEBO 2, which equals 1 from 2013 to 2020 and 0 otherwise. Furthermore, in Models 9–12, we employ a dynamic treatment

[13]To control for potential sample selection biases, we also considered the Heckman selection model. The results (available upon request) are not materially different from those reported in our main findings.

effect analysis by including multiple periods, before and after treatment, in line with Bertrand and Mullainathan (2003). Specifically, in Models 9–12 we include both placebo dummies and the actual reform period (TIME) to reduce potential misspecification biases of exogenous shocks. Models 2, 4, 6, 8, 10, and 12 also add region fixed effects. Overall, both PLACEBO dummies and their respective interactions with CCBs are never statistically significant, further reinforcing H1 on the impact of the 2016 reform on M&As among CCBs. The non-significance of the interaction terms with the placebo years suggests that the effects on M&A activities did not exist two and three years before but are attributable to the actual implementation of the 2016 reform (see Table SA3). Additional LPM specifications with two-way fixed effects (Appendix SA4, Models 1 and 2) and other placebo tests (Appendix SA4, Models 3 and 4) further confirm our main findings, showing a significant increase in M&As due to the CCB reform, especially after its announcement (TIME 2), with no impact from the placebo years.

To re-evaluate the impact of M&As on the performance of the involved banks, in Appendix SA5 we also implement a triple DID combined with a PSM method (following Abadie and Imbens, 2006; Beccalli, Rossi and Viola, 2023). Our main findings on the detrimental impact of M&As on the involved CCBs post-reform are further reinforced, showing decreased capitalization, as well as increased inefficiency and riskiness post-merger. There are some signs of improved operating profitability in the short run, but these gains may be due to the confirmed drop in LLPs post-merger.[14]

Conclusions

This study empirically investigates the impact of M&As on bank performance, before and after the introduction of a relevant regulatory reform of the Italian CCB system (Law 49/2016). Such legal change forced Italian CCBs to either: (a) accept a reduction of independence by joining a larger, vertically integrated banking group or (b) lose their cooperative status by converting into joint-stock companies. With the 2016 reform, the Italian legislator hoped to reinforce the capitalization, liquidity, financial solidity, and performance of CCBs. Following the reform, most CCBs chose option (a) and joined a cooperative banking group, leading to an unprecedented wave of M&As.

Our results show a significant positive impact of the 2016 reform on M&As. However, our findings highlight a substantial deterioration in efficiency, risk-adjusted profitability, and financial stability of the CCBs involved in M&As. This puzzling evidence disproves the expectations of Italian regulators, suggesting that bigger is not always better, at least for CCBs. Focusing on the cost of risk, we find a significant decrease in the LLPs within merged CCBs. This drop, combined with the subsequent surge of M&As, could however be the result of mere balance sheet embellishment activities implemented before mergers. Our findings remain robust across numerous checks and various econometric techniques to limit endogeneity concerns. However, we cannot rule out potential endogeneity issues.

In terms of policy implications, the evidence from our study reveals a puzzling picture where the anticipated benefits from a bank reform have not materialized. The unexpected deterioration in key post-merger performance indicators suggests a need for regulatory recalibration, with more targeted policies for small and medium CCBs, allowing them to expand and become more competitive without facing the adverse outcomes of a massive consolidation process. Researchers and policymakers should explore alternative growth models for CCBs that can provide the advantages associated with a larger size without the downsides. This may include strengthening network arrangements, promoting inter-bank collaborations and establishing multi-level associations to help CCBs remain competitive while preserving their unique operating model (Fonteyne, 2007; Jones and Kalmi, 2012; Ralston, Wright and Garden, 2001). Policymakers could also establish a 'regulatory sandbox' to develop and test new organizational models in a controlled and safe environment, ensuring a better alignment with CCB principles and local economic development. Given that local banks often have a better understanding of local market needs, new policies could focus on supporting these institutions by reducing their regulatory burdens or fostering technological innovation, allowing them to compete more effectively without needing to merge. Also, a more stringent long-term monitoring of the merged banks is crucial to ensure a better alignment of legal reforms with intended goals. From a managerial perspective, the directors of banks engaged in M&As should conduct a comprehensive pre-merger due diligence of their targets (in line with Cumming and Zambelli, 2017) and regularly monitor long-term bank performance after the merger. Given the potential for bank stability deterioration, it becomes crucial for bank managers to implement more sophisticated risk management mechanisms to properly account for the higher organizational complexity introduced by the merger process. Managers should also explore new strategic alliances and consider successful cooperative banking models from other countries.

Aside from the M&A increase and the LLP drop, our findings do not highlight the positive effects on bank

[14]To ensure the robustness of our findings, in our PSM analyses we also considered different matching procedures, as well as a logarithmic transformation of the Z-score. The results (available upon request) confirm our main findings.

performance expected by Italian regulators. Future research could explore the impact of bank reforms and consolidation processes on other performance indicators not considered in our study, such as digital innovation and cost-technical efficiency post-reform. Such indicators are becoming increasingly important due to the expansion of FinTech and artificial intelligence, providing local banks with new challenges and opportunities.

Overall, our evidence sheds light on the perils of massive consolidation processes of local banks, calling for regulatory recalibration and new studies investigating growth models capable of preserving bank diversity, rather than eroding it with a 'one-size-fits-all' approach.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section at the end of the article.

APPENDICES (Tables SA1-SA5): VARIABLE DEFINITIONS, CORRELATION MATRIX AND ROBUSTNESS TESTS

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ORIGINAL ARTICLE

All that Glitters is Not Gold! Could M&As Post-Bank Reforms be Just a Tool for Balance Sheet Embellishment?

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Table SA1 – Variable Descriptions

Table reports the description, the measurement and the source for all the variables considered in our study, grouped in various categories according to their type.

Variable name	Variable Definition	Measure	Source
	TRANSACTION CHARACTERISTICS		
M&A dummy	Dummy variable representing whether the bank has been involved in an M&A transaction.	Dummy equals 1 if bank has been involved in a M&A transaction, 0 otherwise.	Orbis Bank Focus
ACQUIRER dummy	Dummy variable representing whether the bank has been involved *as acquirer* in an M&A transaction.	Dummy equals 1 if bank has been involved in a M&A operation as acquirer, 0 otherwise.	Orbis Bank Focus
	REFORM DUMMY & OTHER PERIOD DUMMIES		
2016 REFORM (TIME)	Post-reform dummy, capturing the period subsequent to the introduction of the Reform of Credit Cooperative banks (CCBs), which entered into force in April 2016 (*in accordance with the Bill of Law No. 18 of 14/02/2016, converted into Law No. 49 of 08/04/2016*).	Dummy equals 1 over the period after2016, 0 before.	Author's definition
ENTRANCE of CCB REFORM	Dummy variable capturing the period from the year of entrance of the CCB Reform (2016) onwards.	Dummy equals 1 over the period from 2016 onwards, 0 before.	Author's definition
ANNOUNCEMENT of CCB REFORM (TIME 2)	Dummy variable related to the announcement in 2015 of the CCB Reform, capturing the period from 2015 onwards.	Dummy equals 1 over the period from 2015 onwards, 0 before.	Author's definition
PLACEBO 1 (2014)	Dummy variable representing a fake introduction of the CCB Reform, considering 2 years before its actual issuance.	Dummy equals 1 over the period from 2014 onwards, 0 otherwise.	Author's definition
PLACEBO 2 (2013)	Dummy variable representing a fake introduction of the CCB Reform, considering 3 years before its actual issuance.	Dummy equals 1 over the period from 2013 onwards, 0 otherwise.	Author's definition
	BANK TYPE		
COMMERCIAL dummy	Dummy variable representing the commercial bank type. This variable also includes Popular banks as "other types of banks".	Dummy equals 1 in case of commercial bank, 0 otherwise.	Orbis Bank Focus
COOPERATIVE (CCB) dummy	Dummy variable representing the status of credit cooperative banks.	Dummy equals 1 in case of credit cooperative bank,0 otherwise.	Orbis Bank Focus

SAVINGS dummy	Dummy variable representing the savings banks (in Italy, they are called "Casse di Risparmio").	Dummy equals 1 in case of saving banks, 0 otherwise.	Orbis Bank Focus
	BANK CHARACTERISTICS		
SIZE	Bank size in terms of logarithmic transformation of total assets (TA).	Natural logarithm of total asset (ln TA).	Orbis Bank Focus
LISTED	Dummy variable representing whether a bank is quoted in the stock market.	Dummy equals 1 if bank is listed, 0 otherwise.	Orbis Bank Focus
	BANK ECONOMIC PERFORMANCE		
ROA	Return on Assets.	Income before taxes over Total Assets.	Orbis Bank Focus
RO_RWA	Risk-adjusted profitability, in terms of Return on risk weighted asset.	Income before taxes over Total Risk Weighted Assets (RWA).	Orbis Bank Focus
COST/INCOME Ratio	The cost-to-income ratio is a proxy of bank operating performance and measures how efficiently the bank is run. The lower the ratio, the higher the efficiency of the bank and the higher its operating profitability. To minimize the effect of outliers, in our main analyses we have used the winsorized ratio at 0.1.	Operating Expenses over the Operating Income (OE/OI).	Orbis Bank Focus
	BANK CAPITALIZATION, CAPITAL ADEQUACY, RISK & STABILITY		
CAPITALIZATION (EQUITY/TA)	Proportion of Equity in relation to the Total Assets of the bank.	Total Equity over Total Asset $= \frac{E}{TA}$	Orbis Bank Focus
TIER-1 RATIO	TIER-1 RATIO is the ratio between the TIER 1 Capital (TIER 1), as defined by regulators, over risk-weighted assets (RWA). *Tier 1* capital is the sum of Common Equity *Tier 1* (CET_1) and *Additional Tier 1* Capital (AT_1), net of the regulatory adjustments.	$TIER\_1 \quad CAPIT\_RATIO = \frac{TIER\_1}{RWA}$	Orbis Bank Focus
RWA_DENSITY	Risk-weighted assets density is a proxy of a bank's risk appetite and risk exposure. The higher the ratio, the more risky the bank's assets become. A higher RWA density implies a deterioration in the risk quality profile.	Risk weighted assets (RWA) over total asset $= \frac{RWA}{TA}$	Orbis Bank Focus
GROSS LOANS/TA	Gross loans ratio as a proxy of bank business model.	Gross customer loans (GL) over total asset (TA) $= \frac{GL}{TA}$	Orbis Bank Focus
GROSS LOANS GROWTH	It is a measure of the credit lending activity expansion.	Year-Percentage Growth of gross loans (GL).	Orbis Bank Focus

LLP RATIO	It is a measure of the capacity of a bank to absorb potential losses on loans.	Loan loss provisions (LLP) over gross loans (GL) $=\frac{LLP}{GL}$	Orbis Bank Focus
NON PERFORMING LOANS RATIO (NPL)	It is a measure of credit portfolio quality.	Non performing loans (NPL) over gross loans (GL) $=\frac{NPL}{GL}$	Orbis Bank Focus
Z-SCORE–winsorized	Z-score is a proxy for bank stability, and it is measured as the ratio between the Return on Asset (ROA) plus bank Capitalization over the standard deviation of ROA (Barra and Ruggiero, 2023). The lower the Z-score, the lower is the bank's stability and the higher is the related default risk, and vice versa (see, e.g., Ayadi et al, 2021). In our main analyses, the denominator of the Z-score is computed by considering the entire sample period. To minimize the effects of outliers, we have winsorized the Z-score results at 0.1.	$Z=\frac{ROA+CAPITALIZATION}{SD_{ROA}}=\frac{ROA+(\frac{EQUITY}{TA})}{SD_{ROA}}$	Own elaboration on Orbis Bank Focus data
Z-score First Component (ROA over sdROA)	It is the first component of the Z-score ratio.	$1st\_component = \frac{ROA}{SD_{ROA}}$	Own elaboration on Orbis Bank Focus data
Z-score Second Component (Equity to Total Asset over_sdROA)	It is the second component of the Z-score ratio.	$2nd\_component = \frac{\frac{EQUITY}{TA}}{SD_{ROA}}$	Own elaboration on Orbis Bank Focus data
	TIME-WINDOW VARIABLES		
	ECONOMIC PERFORMANCE WINDOWS		
Δ ROA	It is a time-window variable related to the return on asset (ROA) over a certain time period (t—t+1; t— t+2; t-1 — t+1; t-1 — t+2).	Bank profitability window	Own elaboration on Orbis Bank Focus data
Δ RO RWA	It is a time-window variable related to the return on risk weighted asset (RWA) over a certain time period (t—t+1; t— t+2; t-1 — t+1; t-1 — t+2).		
Δ COST/INCOME – winsorized	It is a time-window variable related to the winsorized cost-to-income ratio over a certain time period (t—t+1; t— t+2; t-1 — t+1; t-1 — t+2).	Bank operating efficiency window	Own elaboration on Orbis Bank Focus data
	RISK & STABILITY WINDOWS		
Δ ZSCORE –winsorized	It is a time-window variable related to the winsorized Z-score over a certain time period (t—t+1; t— t+2; t-1 — t+1; t-1 — t+2).		Own elaboration on Orbis Bank Focus data

Δ RWA_DENSITY	It is a time-window variable related to the risk-weighted assets density over a certain time period (t—t+1; t— t+2; t-1 — t+1; t-1 — t+2).	Bank risk and stability window	
Δ ROA over sdROA	It is a time-window variable related to the first component of Z-score over a certain time period (t—t+1; t— t+2; t-1 — t+1; t-1 — t+2).		
Δ Equity to Total Asset over_sdROA	It is a time-window variable related to the second component of Z-score over a certain time period (t—t+1; t— t+2; t-1 — t+1; t-1 — t+2).		
Δ LLP RATIO	It is a time-window variable related to the loan loss provisions ratio over a certain time period (t—t+1; t— t+2; t-1 — t+1; t-1 — t+2).	Cost of risk window	Own elaboration on Orbis Bank Focus data
	CAPITAL & ADEQUACY WINDOWS		
Δ_EQUITY/TA	It is a time-window variable related to the equity over total assets over a certain time period (t—t+1; t — t+2; t-1 — t+1; t-1 — t+2).	Bank capitalization and capital requirements window variables	
Δ_TIER 1 RATIO	It is a time-window variable relatedto the Tier1 ratio over a certain time period (t—t+1; t— t+2; t-1— t+1; t-1 — t+2).		Own elaboration on Orbis Bank Focus data
	OTHER CONTROLS: MACROECONOMIC VARIABLES		
BANK ASSET CONCENTRATION	Degree of concentration in the Italian banking industry, calculated as a share of assets held by the 5 largest banks.	Share of assets of a country's 5 largest banks	World Bank Database
DOMESTIC CREDIT_GDP	It is a measure of the banking system development. It considers financial resources provided to the private sector (through loans, purchases of non-equity securities, and trade credits and other accounts receivable, that establish a claim for repayment). https://tradingeconomics.com/.	Domestic credit to private sector (% GDP)	World Bank Database
GDP_GROWTH	Annual growth of Gross Domestic Product	Annual percentage growth rate of GDP, computed at market prices based on constant local currency.	World Bank Database
	REGIONAL MACROECONOMIC VARIABLES		

REGIONAL GDP_ GROWTH	Regional Annual growth of Gross Domestic Product. It is a measure of regional economic expansion.	Annual percentage change in regional gross domestic product.	Author's elaboration on ISTAT data
REGIONAL CREDIT/GDP	It represents the regional credit-to-GDP ratio.	It is computed as the ratio between regional bank loans (*R.Loans*, or regional credit to private sector) and regional GDP (*R.GDP*). $\frac{R.Loans}{R.GDP}$	Author's elaboration on Bank of Italy data combined with ISTAT data (for regional bank loans –*R.Loans*–) and ISTAT data (for regional GDP – *R.GDP*–).* *Data on regional bank loans (*R.Loans*) are available from Bank of Italy from 2012 onward; previous data are available at "*Annuario statistico italiano*" by ISTAT.
REGIONAL MKT CONCENTRATION	It is a proxy of regional loans' market concentration of CCBs, measured by the *Herfindahl Hirshmen Index (HHI).*	$HHI = S1^2 + S2^2 + S3^2 + \ldots + Sn^2$ where: $S_n$represents the market share percentage of the single CCB in a given Region, expressed as a whole number. $S_n$is calculated as ratio between the loans of the single CCB in a given Region (*CCB Loans*) over the total bank loans provided in the same Region (*R.Loans*). $S_n = \frac{CCB\ Loans}{R.Loans} * 100$ n = is the number of the CCBs in a given Region	Author's elaboration on Orbis dataset (for *CCB Loans*), and Bank of Italy data combined with ISTAT data (for regional bank loans –*R.Loans*–).* * Data on regional bank loans (*R.Loans*) are available from Bank of Italy from 2012 onward; previous data are available at "*Annuario statistico italiano*" by ISTAT.

Table SA2 – Correlation matrix

This Table reports the correlations across the main variables used in our multivariate analyses (descriptions are reported in Appendix A1). Correlations statistically significant at the 5 % level are highlighted in bold.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
(1) MA	1.000																		
(2) E/TA	**-0.053**	1.000																	
(3) TIER_1 ratio	**-0.094**	**0.693**	1.000																
(4) RWA_DENS.	-0.017	**0.343**	**-0.234**	1.000															
(5) GL/TA	**0.066**	**-0.291**	**-0.366**	**0.262**	1.000														
(6) NPL ratio	**0.037**	-0.009	**-0.134**	**0.219**	**-0.045**	1.000													
(7) GROW_GL	**0.083**	**-0.164**	**-0.139**	**-0.071**	**0.061**	**-0.352**	1.000												
(8) ROA	-0.020	**0.093**	**0.043**	**-0.041**	**-0.059**	**-0.222**	**0.280**	1.000											
(9) RO RWA	-0.007	-0.003	-0.003	**-0.065**	-0.008	**-0.049**	0.036	**0.120**	1.000										
(10) C/I ratio_w	-0.014	**0.062**	0.029	-0.009	**0.089**	**-0.040**	-0.017	**-0.226**	**-0.051**	1.000									
(11) Z-SCORE_w	**-0.074**	**0.100**	**0.148**	**-0.054**	**-0.097**	**0.126**	0.022	**0.114**	0.017	**-0.214**	1.000								
(12) LLP RATIO	-0.005	0.028	**-0.094**	**0.213**	-0.029	**0.590**	**-0.225**	**-0.228**	**-0.046**	-0.004	-0.002	1.000							
(13) SIZE	**0.258**	**-0.375**	**-0.354**	**-0.155**	**0.219**	**-0.044**	0.013	0.012	0.024	-0.031	**-0.034**	**-0.038**	1.000						
(14) BANK ASSET CONCENTRAT.	0.009	-0.019	-0.002	-0.013	**0.154**	**-0.251**	0.009	**0.054**	0.024	-0.013	**0.045**	**-0.065**	**0.034**	1.000					
(15) DOMESTIC CREDIT_GDP	-0.017	0.004	**-0.095**	**0.227**	**-0.201**	**0.193**	**-0.140**	**-0.074**	-0.013	-0.013	**0.046**	**0.195**	-0.001	-0.012	1.000				
(16) GDP_GROW	0.015	-0.012	**0.057**	**-0.114**	**0.153**	**-0.103**	**0.126**	0.016	0.004	0.023	**-0.061**	**-0.186**	**-0.050**	**-0.383**	**-0.626**	1.000			
(17) LISTED	**0.214**	**-0.068**	**-0.092**	**-0.112**	**-0.078**	**-0.084**	0.010	0.031	0.009	0.003	-0.020	**-0.060**	**0.520**	0.021	**0.047**	**-0.084**	1.000		
(18) CCB DUMMY	-0.030	**-0.038**	0.017	**0.063**	0.021	-0.009	**0.069**	**0.050**	-0.024	**-0.037**	**0.033**	-0.016	**-0.374**	-0.018	**-0.065**	**0.049**	**-0.272**	1.000	
(19) 2016 CCB REFORM	**0.036**	-0.016	**0.094**	**-0.232**	**0.245**	**-0.286**	**0.159**	**0.070**	0.030	0.026	**-0.046**	**-0.218**	0.023	**0.301**	**-0.837**	**0.595**	**-0.034**	**0.041**	1.000

Table SA3 – Placebo Tests and Dynamic DID Impact on M&As (Focus: Total sample)

This Table reports the results of placebo tests and dynamic difference-in-differences analyses on M&As, considering our total sample and using various fake treatment dates as placebo tests (2013 and 2014). The dependent variable is the M&A involvement. In Models 1-4, we conduct the first placebo test (PLACEBO 1), considering the period from 2014 onward. In Models 5-8, we conduct the second placebo test (PLACEBO 2), considering the period from 2013 onward. In Models 9-12, we use a dynamic DID method, including multiple periods (both fake treatment years and the actual post-reform period). For each test, we consider specifications with and without region fixed effects. The key variables are the following: TREATED is a dummy variable equals 1 if bank is a CCB, 0 otherwise; TIME is the dummy variable related to the actual CCB reform period, taking the value of 1 after 2016, and zero otherwise; PLACEBO 1 (2014) is a dummy variable equals 1 from 2014 onwards, 0 otherwise; PLACEBO 2 is a dummy variable equals 1 from 2013 onwards, 0 otherwise; (TIME * TREATED), is the related interaction term, which takes the value 1, in case of CCBs after the 2016 Reform, and 0 otherwise; (PLACEBO 1 * TREATED), is the related interaction term, which takes the value of 1, in case of CCBs from 2014 onward, 0 otherwise; (PLACEBO 2 * TREATED), equals 1 in case of CCBs from 2013 onward, 0 otherwise. The other variables are: bank capitalization, measured as the ratio between equity and total assets (EQUITY/TA); bank risk appetite, proxied by the risk-weighted assets over total assets ratio (RWA DENSITY); bank business model, proxied by the ratio between the gross loans and total assets (GROSS LOANS/TA); credit portfolio quality, measured by the ratio between the non-performing loans over gross loans (NPL RATIO); bank lending activity, measured by the annual percentage change of gross loans (GROWTH GROSS LOANS); bank size, measured by the natural logarithm of total assets (SIZE); LISTED status of banks, proxied by a dummy variable equals 1 if the bank is listed, 0 otherwise. We also controlled for other macroeconomic indicators: bank asset concentration, measured as a share of the assets of the 5 largest banks, over total commercial banking assets (BANK ASSET CONCENTRATION); banking system development, measured by the ratio between the domestic credit to the private sector over GDP (DOMESTIC CREDIT_GDP); economic growth as the annual growth of GDP (GDP_GROWTH). All bank-specific and macroeconomic variables are considered at time t-1.

	PLACEBO TEST 1				**PLACEBO TEST 2**				**DYNAMIC DID**			
Dependent Variable: M&A involvement *(Focus: Total sample)*	**(1) PROBIT**	**(2) PROBIT**	**(3) LOGIT**	**(4) LOGIT**	**(5) PROBIT**	**(6) PROBIT**	**(7) LOGIT**	**(8) LOGIT**	**(9) PROBIT**	**(10) PROBIT**	**(11) LOGIT**	**(12) LOGIT**
TREATED (CCBs)	2.18e-05	-0.005	0.008	0.000	-0.008	-0.011	0.0029	-0.003	-0.012	-0.014	-0.003	-0.007
	(0.026)	(0.027)	(0.028)	(0.030)	(0.031)	(0.032)	(0.032)	(0.035)	(0.032)	(0.032)	(0.034)	(0.035)
TIME (2016 REFORM)	-	-	-	-	-	-	-	-	0.013	0.016	0.008	0.009
									(0.024)	(0.025)	(0.026)	(0.027)
PLACEBO 1 (2014)	0.015	0.011	0.011	0.005	-	-	-	-	0.051	0.046	0.039	0.032
	(0.025)	(0.026)	(0.025)	(0.027)					(0.035)	(0.038)	(0.041)	(0.044)
PLACEBO 2 (2013)	-	-	-	-	0.008	0.006	0.009	0.003	-0.032	-0.028	-0.017	-0.015
					(0.032)	(0.032)	(0.030)	(0.032)	(0.040)	(0.041)	(0.043)	(0.045)
TIME * TREATED (CCBs after 2016 Reform)	-	-	-	-	-	-	-	-	0.042**	0.041**	0.045**	0.044*
									(0.020)	(0.021)	(0.022)	(0.023)
PLACEBO 1 * TREATED (CCBs after 2014)	0.029	0.030	0.033	0.039	-	-	-	-	-0.020	-0.014	-0.011	0.001
	(0.028)	(0.029)	(0.029)	(0.032)					(0.048)	(0.051)	(0.054)	(0.059)
PLACEBO 2 * TREATED (CCBs after 2013)	-	-	-	-	0.036	0.036	0.037	0.041	0.034	0.028	0.025	0.017

					(0.032)	(0.033)	(0.034)	(0.036)	(0.055)	(0.057)	(0.061)	(0.065)
EQUITY_TA	0.044	0.027	0.035	0.016	0.047	0.030	0.035	0.016	0.049	0.033	0.042	0.026
	(0.095)	(0.110)	(0.093)	(0.113)	(0.095)	(0.109)	(0.092)	(0.113)	(0.093)	(0.107)	(0.093)	(0.112)
RWA_DENSITY	-0.054*	-0.055*	-0.045	-0.045	-0.056*	-0.058*	-0.047	-0.048	-0.042	-0.042	-0.032	-0.032
	(0.029)	(0.032)	(0.030)	(0.035)	(0.030)	(0.033)	(0.031)	(0.036)	(0.029)	(0.032)	(0.030)	(0.034)
GROSS LOANS_TA	0.116***	0.131***	0.128***	0.142***	0.118***	0.133***	0.130***	0.144***	0.103***	0.117***	0.110***	0.122***
	(0.028)	(0.031)	(0.029)	(0.033)	(0.028)	(0.031)	(0.029)	(0.033)	(0.027)	(0.031)	(0.029)	(0.033)
NPL RATIO	0.217***	0.225***	0.196***	0.205***	0.220***	0.228***	0.197***	0.207***	0.215***	0.219***	0.190***	0.199***
	(0.047)	(0.051)	(0.044)	(0.050)	(0.047)	(0.051)	(0.044)	(0.050)	(0.046)	(0.050)	(0.044)	(0.049)
GROWTH_GROSS LOANS	0.283***	0.300***	0.304***	0.323***	0.283***	0.300***	0.304***	0.323***	0.271***	0.288***	0.290***	0.308***
	(0.035)	(0.036)	(0.032)	(0.033)	(0.035)	(0.036)	(0.032)	(0.033)	(0.034)	(0.035)	(0.032)	(0.033)
SIZE	0.025***	0.026***	0.026***	0.027***	0.025***	0.026***	0.026***	0.027***	0.026***	0.026***	0.026***	0.027***
	(0.004)	(0.0039)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
BANK ASSET CONCENTRATION	-0.081	-0.092	-0.103	-0.107	-0.079	-0.089	-0.098	-0.103	-0.259***	-0.277***	-0.263**	-0.268**
	(0.068)	(0.070)	(0.066)	(0.069)	(0.073)	(0.073)	(0.068)	(0.071)	(0.094)	(0.094)	(0.105)	(0.105)
DOMESTIC CREDIT_GDP	0.332***	0.352***	0.343***	0.358***	0.329**	0.352***	0.353***	0.364***	0.498***	0.534***	0.521***	0.541***
	(0.115)	(0.119)	(0.118)	(0.122)	(0.132)	(0.130)	(0.129)	(0.131)	(0.163)	(0.165)	(0.179)	(0.183)
GDP_GROWTH	0.291	0.291	0.216	0.184	0.440	0.433	0.400	0.343	-0.473	-0.474	-0.368	-0.404
	(0.426)	(0.439)	(0.435)	(0.452)	(0.504)	(0.501)	(0.477)	(0.490)	(0.388)	(0.383)	(0.382)	(0.387)
LISTED	-0.006	0.006	-0.014	-0.002	-0.005	0.007	-0.013	-0.001	-0.004	0.007	-0.011	0.000
	(0.018)	(0.020)	(0.018)	(0.021)	(0.018)	(0.020)	(0.018)	(0.021)	(0.018)	(0.020)	(0.018)	(0.021)
REGION FE	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES
Pseudo R-square	0.2613	0.2719	0.2705	0.2806	0.2606	0.2713	0.2700	0.2799	0.2703	0.2803	0.2784	0.2879
Observations	2,691	2,554	2,691	2,554	2,691	2,554	2,691	2,554	2,691	2,554	2,691	2,554

Note: *Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table SA4 – Further Robustness Checks with LPM: Two-way Fixed Effects and Placebo Tests (Focus: Total sample)

This Table presents the results of additional difference-in-differences analyses evaluating the impact of the CCB Reform and its announcement on M&As, by employing a two-way fixed effects method and further placebo tests with LPM. Specifically, Models 1-2 include both bank and year fixed effects (TWO-WAY FE), to estimate the impact of the 2016 Reform (Model 1) and its announcement in 2015 (Model 2) on M&As. Models 3-6 conduct additional placebo tests with LPM. Models 7-8 add Dynamic DID specifications, including multiple periods (both fake treatment years and the actual post-reform period). Models 4, 6, and 8 add Region fixed effect. In these Models, the key explanatory variables are defined as follows: TREATED is a dummy variable equals 1 if the bank is a CCB, 0 otherwise; TIME is a dummy variable taking the value of 1 after the 2016 Reform, and 0 otherwise; PLACEBO 1 (2014) is a dummy variable equals 1 from 2014 onwards, 0 otherwise; PLACEBO 2 is a dummy variable equals 1 from 2013 onwards, 0 otherwise; TIME * TREATEDis the interaction term taking the value of 1, in case of CCBs after the 2016 Reform, 0 otherwise; TIME 2 * TREATED is the interaction term taking the value of 1, in case of CCBs after 2015 (announcement of CCB Reform); 0 otherwise; PLACEBO 1 * TREATED is the related interaction term, which takes the value of 1, in case of CCBs from 2014 onwards, 0 otherwise; PLACEBO 2 * TREATED equals 1 in case of CCBs from 2013 onward, 0 otherwise. The other explanatory variables are: equity over total assets (EQUITY/TA); risk weighted assets over total assets ratio (RWA DENSITY); gross loans over total assets (GROSS LOANS/TA); non-performing loans over gross loans (NPL RATIO); annual percentage change of gross loans (GROWTH GROSS LOANS); natural logarithm of total assets (SIZE); LISTED dummy. We also controlled for other macroeconomic indicators: bank asset concentration; domestic credit to private sector over GDP (DOMESTIC CREDIT_GDP); annual growth of GDP (GDP_GROWTH). All bank-specific and macroeconomic variables are considered at time t-1.

Dependent Variable: M&A involvement	**TWO-WAY FE**		**PLACEBO TEST 1**		**PLACEBO TEST 2**		**DYNAMIC DID**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
	LPM	**LPM**	**LPM**	**LPM**	**LPM**	**LPM**	**LPM**	**LPM**
TREATED (CCBs)	-	-	0.024	0.021	0.028	0.025	0.024	0.022
			(0.022)	(0.023)	(0.026)	(0.027)	(0.027)	(0.027)
TIME (2016 REFORM)	-	-	-	-	-	-	0.007	0.007
							(0.028)	(0.028)
PLACEBO 1 (2014)	-	-	0.002	0.000	-	-	0.025	0.022
			(0.025)	(0.026)			(0.041)	(0.041)
PLACEBO 2 (2013)	-	-	-		0.018	0.018	0.020	0.023
					(0.028)	(0.029)	(0.042)	(0.042)
TIME * TREATED (CCBs after 2016)	0.042*	-	-	-	-	-	0.070***	0.069***
	(0.024)						(0.024)	(0.024)
TIME 2 * TREATED (CCBs after 2015 Announcement)	-	0.088***	-	-	-	-	-	-
		(0.028)						
PLACEBO 1 * TREATED (CCBs after 2014)	-	-	0.015	0.014	-	-	-0.019	-0.015
			(0.024)	(0.024)			(0.042)	(0.042)
PLACEBO 2 * TREATED (CCBs after 2013)	-	-	-	-	0.011	0.008	-0.010	-0.014

					(0.027)	(0.027)	(0.044)	(0.044)
EQUITY/TA	0.426	0.381	0.337***	0.325***	0.333***	0.321***	0.310***	0.300***
	(0.327)	(0.320)	(0.100)	(0.103)	(0.100)	(0.103)	(0.100)	(0.104)
RWA_DENSITY	-0.109	-0.084	-0.068**	-0.086**	-0.066**	-0.083**	-0.043	-0.060*
	(0.088)	(0.087)	(0.032)	(0.035)	(0.032)	(0.036)	(0.032)	(0.036)
GROSS LOANS/TA	0.0839	0.091	0.052*	0.055*	0.051*	0.054*	0.037	0.039
	(0.0822)	(0.081)	(0.029)	(0.031)	(0.029)	(0.031)	(0.029)	(0.030)
NPL RATIO	0.0518	0.057	0.201***	0.211***	0.196***	0.204***	0.205***	0.213***
	(0.121)	(0.121)	(0.049)	(0.056)	(0.048)	(0.056)	(0.049)	(0.057)
GROWTH_GROSS LOANS	0.192**	0.190**	0.054	0.053	0.054	0.053	0.054	0.052
	(0.088)	(0.087)	(0.038)	(0.038)	(0.038)	(0.038)	(0.037)	(0.037)
SIZE	0.157***	0.159***	0.032***	0.032***	0.032***	0.032***	0.031***	0.031***
	(0.034)	(0.0334)	(0.004)	(0.005)	(0.004)	(0.005)	(0.004)	(0.005)
BANK ASSET CONCENTRATION	-	-	-0.018	-0.006	0.000	0.011	-0.205**	-0.192**
			(0.070)	(0.072)	(0.069)	(0.071)	(0.085)	(0.083)
DOMESTIC CREDIT_GDP	-	-	0.109	0.111	0.167	0.168	0.451***	0.450***
			(0.100)	(0.101)	(0.105)	(0.105)	(0.156)	(0.156)
GDP_GROWTH	-	-	0.606*	0.615*	0.843**	0.838**	-0.047	-0.032
			(0.326)	(0.331)	(0.332)	(0.337)	(0.305)	(0.305)
LISTED	-	-	0.012	0.023	0.012	0.023	0.015	0.026
			(0.031)	(0.032)	(0.031)	(0.032)	(0.031)	(0.032)
Constant	-2.158***	-2.233***	-0.551***	-0.553***	-0.626***	-0.628***	-0.744***	-0.742***
	(0.473)	(0.468)	(0.134)	(0.135)	(0.145)	(0.147)	(0.159)	(0.159)
YEAR FE	YES	YES	-	-	-	-	-	-
BANK ID FE	YES	YES	-	-	-	-	-	-
REGION FE	NO	NO	NO	YES	NO	YES	NO	YES
Observations	2,614	2,614	2691	2691	2691	2691	2691	2691
R-squared	0.308	0.311	0.062	0.067	0.062	0.067	0.069	0.074

Note: *Robust standard errors are in parentheses*. **** p<0.01, ** p<0.05, * p<0.1.*

Table SA5– TRIPLE DID with PSM: Effects on capitalization, stability, risk and performance (Focus: Total Sample)

This Table presents the second-stage estimates for various types of outcomes using a triple difference-in-differences approach in conjunction with a linear probability model (subsequent to the implementation of a PSM approach in the first stage). In particular, this Table reports the outcomes in terms of capitalization, risk, stability, profitability, and efficiency of banks involved in M&As (TREATED group), compared to banks not involved in M&As (CONTROL group) across different time periods, ranging from the year before the M&A (t-1) to 2 years after (t+2). Specifically, Panel A refers to the impact on capitalization in terms of TIER1 ratio (Models 1-4) and EQUITY_TA (Models 5-8); Panel B refers to the impact on risk and stability in terms of Z-SCORE (Models 9-12) and RWA DENSITY (Models 13-16); Panel C reports the impact on profitability in terms of ROA (Models 17-20) and RO_RWA (Models 21-24); Panel D focuses on the impact on cost efficiency in terms of COST/INCOME ratio (Models 25-28) and on cost of risk, in terms of LLP ratio (Models 29-32). Within each Panel, we consider the variation in the above outcomes over 4 different time periods, reported in separate columns (from t-1 to t+2). In this Table the interaction terms are defined as follows: (CCB REFORM#M&A) refers to the interaction between the 2016 Reform (CCB Reform) and M&As; (CCB#M&A) refers to the interaction between cooperative banks (CCBs) and M&As; (CCB#CCB REFORM) refers to the interaction between CCBs and the 2016 Reform; (CCB#M&A#CCB REFORM) represents our key variable of interest, i.e., the triple interaction among CCBs, M&As, and the 2016 Reform, showing the outcomes of the CCBs involved in M&As after the 2016 Reform, compared to the other banks. Observable matching characteristics: E/TA; RWA ratio; GL/TA; NPL ratio; Growth GL; SIZE; LISTED; Bank Assets concentration; Domestic credit to GDP; GDP growth.

Panel A –Capitalization

Triple DID-PSM	**ΔTIER1 ratio**				**ΔEQUITY/TA**			
Model specifications	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**
	TIER1	**TIER1**	**TIER1**	**TIER1**	**E/A**	**E/A**	**E/A**	**E/A**
	(t ; t+1)	**(t ; t+2)**	**(t-1; t+1)**	**(t-1; t+2)**	**(t ; t+1)**	**(t ; t+2)**	**(t-1; t+1)**	**(t-1; t+2)**
M&A	-0.005	0.020	-0.011	0.020	0.001	-0.002	0.010	0.007
	(0.010)	(0.016)	(0.018)	(0.026)	(0.009)	(0.015)	(0.012)	(0.021)
CCB REFORM	-0.029***	-0.016	-0.046***	-0.018	-0.014***	-0.006	-0.010*	0.005
	(0.010)	(0.016)	(0.012)	(0.019)	(0.005)	(0.011)	(0.006)	(0.011)
CCB REFORM#M&A	0.006	-0.013	-0.015	-0.019	0.010	0.022	0.023	0.043***
	(0.029)	(0.018)	(0.035)	(0.028)	(0.025)	(0.018)	(0.023)	(0.016)
CCB	-0.015**	-0.016**	-0.023***	-0.021**	-0.002	-0.008	-0.002	-0.008
	(0.006)	(0.007)	(0.009)	(0.010)	(0.005)	(0.011)	(0.006)	(0.011)
CCB#M&A	-0.006	0.008	-0.023***	-0.002	-0.003	-0.004	-0.003	
	(0.007)	(0.009)	(0.009)	(0.011)	(0.005)	(0.010)	(0.005)	(0.010)
CCB#CCB REFORM	-0.032***	-0.027*	-0.056***	-0.039**	-0.019***	-0.020*	-0.019***	-0.012
	(0.010)	(0.016)	(0.013)	(0.017)	(0.005)	(0.011)	(0.006)	(0.011)
CCB#M&A#CCB REFORM	-0.024***	-0.003	-0.053***	-0.014	-0.015***	-0.007	-0.014*	0.000
	(0.009)	(0.013)	(0.015)	(0.017)	(0.006)	(0.011)	(0.008)	(0.010)

BANK CONTROLS	YES	YES	YES	YES	YES	YES	YES	YES
COUNTRY CONTROLS	YES	YES	YES	YES	YES	YES	YES	YES
REGION FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	1,761	1,263	1,763	1,264	1,791	1,291	1,791	1,291
R-squared	0.064	0.119	0.109	0.178	0.034	0.055	0.089	0.084

Panel B –Stability and Risk

Triple DID-PSM	**ΔZ-SCORE_winsorized**				**ΔRWA_DENSITY**			
Model	**Model 9**	**Model 10**	**Model 11**	**Model 12**	**Model 13**	**Model 14**	**Model 15**	**Model 16**
Specification	**ZSCORE_W (t ; t+1)**	**ZSCORE_W (t ; t+2)**	**ZSCORE_W (t-1; t+1)**	**ZSCORE_W (t-1; t+2)**	**RWA (t ; t+1)**	**RWA (t ; t+2)**	**RWA (t-1; t+1)**	**RWA (t-1; t+2)**
M&A	-2.411	-4.996	-8.264*	-12.780	0.020	0.101**	0.018	0.100***
	(1.678)	(4.645)	(5.007)	(9.683)	(0.025)	(0.040)	(0.022)	(0.024)
CCB REFORM	-5.54***	-1.657	-5.157***	7.010***	0.056***	0.089***	0.052***	0.105***
	(1.46)	(2.192)	(1.660)	(2.543)	(0.010)	(0.014)	(0.020)	(0.021)
CCB REFORM#M&A	-4.334**	0.748	-2.303	11.06***	0.126**	0.132**	0.204***	0.252***
	(1.949)	(1.782)	(2.432)	(2.461)	(0.052)	(0.064)	(0.073)	(0.084)
CCB	-0.288	-1.620	0.229	-1.143	0.005	0.017	0.005	0.014
	(0.795)	(1.273)	(0.998)	(1.535)	(0.008)	(0.011)	(0.012)	(0.014)
CCB#M&A	-1.426	-2.025	0.271	-0.382	-0.007	0.024	-0.013	0.009
	(1.032)	(2.553)	(1.304)	(2.947)	(0.013)	(0.017)	(0.018)	(0.021)
CCB#CCB REFORM	-7.235***	-3.999**	-8.015***	2.554	0.055***	0.084***	0.053***	0.100***
	(1.272)	(1.942)	(1.488)	(2.320)	(0.010)	(0.013)	(0.020)	(0.021)
CCB#M&A#CCB REFORM	-9.205***	-3.379	-10.69***	2.555	0.049***	0.082***	0.061***	0.107***
	(1.644)	(2.254)	(2.256)	(3.046)	(0.011)	(0.015)	(0.020)	(0.022)
BANK CONTROLS	YES	YES	YES	YES	YES	YES	YES	YES
COUNTRY CONTROLS	YES	YES	YES	YES	YES	YES	YES	YES
REGION FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	1,791	1,291	1,791	1,291	1,694	1,712	1,189	1,208
R-squared	0.086	0.069	0.135	0.153	0.204	0.261	0.255	0.341

Panel C –Profitability

Triple DID-PSM	**ΔROA**				**ΔRO_RWA**			
Model	**Model 17**	**Model 18**	**Model 19**	**Model 20**	**Model 21**	**Model 22**	**Model 23**	**Model 24**
Specification	**ROA (t ; t+1)**	**ROA (t ; t+2)**	**ROA (t-1; t+1)**	**ROA (t-1; t+2)**	**RO_RWA (t ; t+1)**	**RO_RWA (t ; t+2)**	**RO_RWA (t-1; t+1)**	**RO_RWA (t-1; t+2)**
M&A	0.012	-0.006*	0.014**	-0.004	-0.099	-0.304	-0.095	-0.299
	(0.007)	(0.003)	(0.006)	(0.008)	(0.212)	(0.424)	(0.208)	(0.422)
CCB REFORM	0.007**	0.007	0.007**	0.006	0.016	0.041	0.015	0.036
	(0.003)	(0.006)	(0.003)	(0.007)	(0.026)	(0.048)	(0.026)	(0.049)
CCB REFORM#M&A	0.001	-0.000	0.002	0.002	-0.022	0.019	-0.028	0.030

	(0.007)	(0.006)	(0.014)	(0.016)	(0.029)	(0.049)	(0.030)	(0.060)
CCB	0.004	-0.003	0.003	-0.004	0.040	0.057	0.039	0.0560
	(0.003)	(0.003)	(0.003)	(0.003)	(0.040)	(0.060)	(0.039)	(0.060)
CCB#M&A	0.008**	0.000	0.005	-0.004	0.057	0.077	0.051	0.068
	(0.004)	(0.004)	(0.004)	(0.004)	(0.046)	(0.072)	(0.045)	(0.072)
CCB#CCB REFORM	0.008	0.001	0.005	0.003	-0.032	-0.058	-0.038	-0.055
	(0.005)	(0.003)	(0.004)	(0.004)	(0.043)	(0.066)	(0.043)	(0.065)
CCB#M&A#CCB REFORM	0.014**	0.002	0.008**	-0.000	-0.001	-0.030	-0.013	-0.035
	(0.007)	(0.004)	(0.004)	(0.007)	(0.029)	(0.044)	(0.027)	(0.045)
BANK CONTROLS	YES	YES	YES	YES	YES	YES	YES	YES
COUNTRY CONTROLS	YES	YES	YES	YES	YES	YES	YES	YES
REGION FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	1,791	1,291	1,791	1,291	1,694	1,189	1,712	1,208
R-squared	0.026	0.043	0.035	0.064	0.072	0.101	0.073	0.100

Panel D – Cost/Income ratio and Cost of Risk

Triple DID-PSM	**Δ COST/INCOME_winsorized**				**Δ LLP ratio**			
Model	**Model 25**	**Model 26**	**Model 27**	**Model 28**	**Model 29**	**Model 30**	**Model 31**	**Model 32**
Specification	**C/I_W (t ; t+1)**	**C/I_W (t ; t+2)**	**C/I_W (t-1; t+1)**	**C/I_W (t-1; t+2)**	**LLP (t ; t+1)**	**LLP (t ; t+2)**	**LLP (t-1; t+1)**	**LLP (t-1; t+2)**
M&A	-0.011	-0.033**	-0.053	-0.045	-0.001	0.006	-0.001	0.004
	(0.027)	(0.013)	(0.050)	(0.069)	(0.004)	(0.004)	(0.003)	(0.004)
CCB REFORM	0.056***	0.005	0.027*	-0.060***	-0.007**	-7.68e-05	-0.002	0.002
	(0.013)	(0.022)	(0.014)	(0.020)	(0.003)	(0.003)	(0.003)	(0.003)
CCB REFORM#M&A	0.171***	0.176***	0.054	-0.017	-0.009*	-0.009*	-0.007	-0.011*
	(0.036)	(0.044)	(0.057)	(0.079)	(0.005)	(0.005)	(0.006)	(0.006)
CCB	0.011	0.016	0.023**	0.026**	0.001	0.001	0.002	0.001
	(0.009)	(0.011)	(0.010)	(0.011)	(0.002)	(0.001)	(0.002)	(0.001)
CCB#M&A	-0.014	-0.009	0.024	0.027	-0.004	-0.004	-0.001	-0.003
	(0.019)	(0.021)	(0.022)	(0.023)	(0.003)	(0.003)	(0.003)	(0.003)
CCB#CCB REFORM	0.065***	0.025	0.050***	-0.032	-0.007**	-0.001	-0.003	-0.001
	(0.012)	(0.022)	(0.013)	(0.020)	(0.003)	(0.003)	(0.004)	(0.003)
CCB#M&A#CCB REFORM	0.073***	0.063***	0.035*	-0.013	-0.010***	-0.006**	-0.002	-0.003
	(0.015)	(0.022)	(0.020)	(0.022)	(0.003)	(0.003)	(0.004)	(0.003)
BANK CONTROLS	YES	YES	YES	YES	YES	YES	YES	YES
COUNTRY CONTROLS	YES	YES	YES	YES	YES	YES	YES	YES
REGION FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	1,790	1,290	1,790	1,290	1,785	1,284	1,784	1,283
R-squared	0.057	0.106	0.174	0.263	0.056	0.137	0.170	0.239

Note: *Robust standard errors are in parentheses.*** p<0.01, ** p<0.05, * p<0.1.*

Online Appendix (2)

PSM METHODOLOGY APPLIED TO THE M&A INVOLVEMENT OF CCBs

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ORIGINAL ARTICLE

All that Glitters is Not Gold! Could M&As Post-Bank Reforms be Just a Tool for Balance Sheet Embellishment?

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PSM METHODOLOGY APPLIED TO THE M&A INVOLVEMENT OF CCBs

The PSM method allows economists to measure the effect of a treatment (e.g., a regulatory change) on a series of outcomes, assuming unconfoundedness and common support conditions (Rosenbaum and Rubin 1983). Over the last decades, PSM approaches have become a popular nonparametric technique in the field of finance to estimate causal treatment effects in observational (non-randomized) studies, especially adopted to evaluate policy and regulatory impacts (see, e.g., Ayadi et al., 2021; Casu et al., 2013; Cumming and Zambelli, 2017; Caliendo and Kopeinig, 2008; Beccalli and Franz, 2009; Jalan and Ravallion, 2003). PSM can be applied in any study where we can identify: (a) a treatment; (b) a group of treated subjects and; (c) a control sample of non-treated subjects (Casu et al., 2013; Caliendo and Kopeinig, 2008). In our case, the treatment is represented by the M&A involvement, and the treated group is composed of the CCBs involved in M&As. Given that the M&A is a decision taken by the Board of Directors, it may suffer from endogeneity and selection biases. To address this issue, we employ PSM by following four steps, in line with the above literature: (1) propensity score estimation; (2) matching of units; (3) control for balance; and (4) estimation of the final impact of M&A involvement in terms of Average Treatment Effect on the Treated (ATET).

(1) First, we estimate the propensity scores *p(x),* defined as the conditional probability of receiving a treatment or being assigned to a particular treatment (i.e., M&A involvement), given a set of observed pre-treatment characteristics or confounders (Rosenbaum and Rubin, 1983; Caliendo and Kopeinig, 2008).

$$p(x) = P\,(T=1|X=x) \qquad (1)$$

where: p(x) is the propensity score, conditional on a set of observed characteristics; P is the probability of receiving the treatment; T is the treatment (M&A); Xs are the observed covariates. Given that M&As are captured by a binary time-variant variable, to estimate the probability of being involved in an M&A, conditional on a set of observed characteristics (X_{it-1}) taken at time t-1, we adopt a probit model according to the following binary response, in line with Casu et al. (2013) and Ayadi et al. (2021):

$$P\,(T_{it} = 1) = P\,(\alpha_0 + \sum_{k=1}^{k} \beta_k X_{ki,t-1} + Y_{kt} + \varepsilon_{it} > 0) \qquad (2)$$

where: (T_{it}) is a dummy variable indicating the treatment, taking the value of 1 if bank *(i)* is involved in an M&A at time *t,* and 0 otherwise; α_0 is a constant; K represents the number of explanatory variables ($X_{ki,t-1}$) in the selection equation, taken at the time *t-1,* as the variables included in the PSM should not be affected by the treatment (Casu et al., 2013; Caliendo and Kopeinig, 2008); Y_t are the year dummies and ε_{it} represents the identically and independently distributed error term.

(2) Once the propensity scores are estimated, as a second step, for each year we proceed by matching the CCBs involved in the M&A deals (treat group) with the banks not involved in M&As (control group). To this end, we employ a matching algorithm based on the nearest-neighbor procedure (Abadie and Imbens, 2002) with multiple neighbor matching (considering 3 matches, in line with Ayadi et al., 2021). In this way, for each treated unit, the method will identify and match the three untreated units with the closest propensity scores to the treated unit. By matching on the propensity score, it is possible to create comparable treatment and control groups that are similar with respect to the distribution of observed characteristics. If this similarity is ensured, we can estimate the effect of M&As on CCB performance more accurately. In the matching procedure, we control for bank-specific characteristics, taken at year t-1. Such a procedure allows us to compare banks that share the same cluster and are very similar in terms of performance, differing only in the decision to implement the M&A.[1]

(3) Once the matching procedure is completed, as a third step, we proceed by checking the balance of the created groups to make sure that the characteristics of the treated and control groups are statistically comparable. The main purpose of the propensity score estimation is not only to predict the conditional probability of a certain treatment but also to balance the covariates between the two groups (Caliendo and Kopeinig 2008).[2] In our case, the matched units in the treated and control groups do not show significant differences for all the covariates included in the propensity score (results of our matching procedure are reported in this Online Appendix, Figure A1; Tables A1-A2).

[1] More specifically, the covariates included in the matching procedure are reported in the Appendix of this Author's Response, in Table A1 (EQUITY/TA; RWA_DENSITY; GROSS LOANS/TA; NPL; GROWTH GL; SIZE; LISTED; BANK ASSET CONCENTRATION; DOMESTIC CREDIT_GDP; GDP_GROWTH). Table A2 reports the differences in means, before and after the matching. For brevity reasons, we do not report these Tables and Figures in the paper, but are available upon request.

[2] Given the difficulties of implementing a direct matching on covariates, PSM can be very helpful in cases of highly dimensional vector of covariates (see, Casu et al., 2013; Rosenbaum and Rubin, 1983).

(4) As a last step, we proceed by evaluating the effects of M&As on the bank performance, by considering the average treatment effect on the treated (ATET), which in theory represents the difference between the outcome of the treated group in the case of treatment (Y^1) and the outcome of the same treated group in the absence of treatment (Y^0):

$$ATET = E[Y^1 - Y^0 \mid T=1] \quad (3)$$

$$ATET = E[\Delta Y^1_{i,t+1} \mid T_{i,t}=1] - E[\Delta Y^0_{i,t+1} \mid T_{i,t}=1] \quad (4)$$

where, in our case: T is the treatment (i.e., the M&A involvement); Y represents the outcome (e.g., capitalization, risk, stability, cost efficiency); E[.] is taken from the distribution of observed characteristics (X) among the treated (T=1); $\Delta Y^1_{i,t+1}$ is the performance change of the cooperative $bank_i$ (treat group) after the M&A in the period t+1 in case of treatment; $\Delta Y^0_{i,t+1}$ is the potential performance change that the same treat units (CCBs) would have obtained at time t+1, if they were not treated (i.e., not involved in M&As). The second part of equation (4) represents the counterfactual components (Egger and Hahn, 2010), which is the outcome of the treated units in case they were not treated. In summary:

$$Y = \begin{cases} Y^1 & \text{if } T=1 \quad \text{(outcome of treat group, with treatment)} \\ Y^0 & \text{if } T=1 \quad \text{(outcome of treat group, with no treatment)} \end{cases}$$

As well known, $\Delta Y^0_{i,t+1}$ is only hypothetical because the counterfactual component is not observable in practice (Splawa-Neyman et al., 1990; Rubin, 1973), as it is not possible to observe both outcomes (Y^1) and (Y^0) for the same treated group (T=1). As such, we need to identify a proxy for it. In experimental studies, this underlying potential sample selection bias is addressed by using a random assignment of individuals to the treated group, in order to ensure that every individual has the same probability of receiving a treatment (Jyotsna and Ravallion, 2003). This is not possible in the non-experimental studies, as is our case, and we need to approximate the counterfactual term $\{E[Y^0 \mid T=1]\}$ with a close match $\{E[Y^0 \mid T=0, p(x)]\}$, by considering comparable control units not exposed to the treatment (T=0), matched upon their propensity scores p(x). With this assumption, banks not involved in M&As (T=0) can serve as an adequate control group.

$$Y = \begin{cases} Y^1 & \text{if } T=1 \quad \text{(treat group)} \\ Y^0 & \text{if } T=0 \quad \text{(control group)} \end{cases}$$

In this way, by matching on the propensity scores, we can reduce the potential selection biases in the estimation of treatment effects in observational studies. We can then estimate the final impact of the treatment (M&A involvement) on the treated group (CCBs), as the average difference in outcomes between the results (Y^1) observed in the treat units (T=1) and the results (Y^0) observed in the matched group not treated (T=0), both matched on the propensity scores (p), conditional on a set of covariates (x). As such:

$$\text{ATET} = E[\Delta Y^1_{i,t+1} \mid T_{i,t}=1, p(x)] - E[\Delta Y^0_{i,t+1} \mid T_{i,t}=0, p(x)] \qquad (5)$$

where:

$$\Delta \begin{cases} E[Y_1 \mid T=1, p(x)] \text{ is the outcome of created treat group (CCBs)} \\ E[Y_0 \mid T=0, p(x)] \text{ is the outcome of the matched control group} \end{cases}$$

As anticipated, the PSM requires two key assumptions: (a) the assignment to treat group must be independent of the outcomes (*conditional independence assumption*, or unconfoundness),[3] and (b) the probability of assignment is bounded away from 0 to 1 (*overlap condition* or common support).[4] In other terms, the PSM technique requires that the function generating balancing scores is independent of the assignment of firm *i* into the treatment group in year *t*. Given the above key assumptions, for the purpose of our study, we can identify the average treatment effects on the treated (CCBs), as follows:

$$\text{ATET} = E[\Delta Y^1_{i,t+1} \mid T_{i,t}=1, p(X_{i,t-1})] - E[\Delta Y^0_{i,t+1} \mid T_{i,t}=0, p(X_{i,t-1})] \qquad (6)$$

where: $E(\Delta y^1_{i,t+1} \mid w_{i,t} = 1, p(X_{i,t-1})$ represents the average performance change at time *t+1* of banks involved in an M&A at time t; $E(\Delta y^0_{i,t+1} \mid w_{i,t} = 0, p(X_{i,t-1}))$ represents the average performance change at time t+1 of banks not involved in an M&A deal at time t (control group); and $X_{i,t-1}$ is a vector of conditioning covariates observed at time *t-1*.

[3] This implies that, after controlling for observed characteristics, there is no systematic difference between the treated and control groups that could affect the outcome variable (see Table A2).

[4] This implies that, for every level of the observed characteristics, there is a positive probability of being either in the treated or in the control group and, as such, for each treated unit, it is possible to find a similar unit in the control group (and vice versa). See Figures A1 and Tables A1-A2 for more details.

Online Appendix - **References**

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Figure A1 - Propensity score matching before and after matching

Figure shows the distribution of the propensity score before and after the matching procedure. Treated refers to the cooperative banks involved in M&As and Untreated to banks not involved in any M&As.

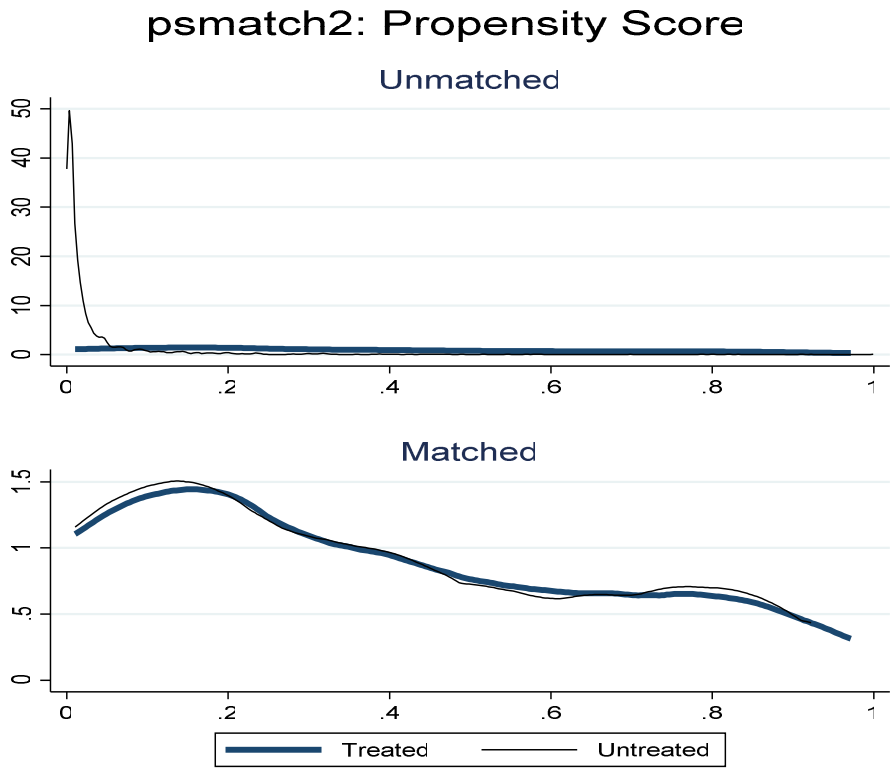

Table A1 - Propensity score matching on cooperative banks – CCB focus

This Table describes the probability of M&A involvement (depending on a series of observable matching characteristics: E/TA; RWA density ratio; GL/TA; NPL ratio; Growth GL; SIZE; LISTED; Bank Assets concentration; Domestic credit to GDP; GDP growth). The dependent variable is the probability of being involved in an M&A (dummy variable equals 1 if cooperative bank is involved in a M&A in a specific year and 0 otherwise).

M&A	Coefficient	Std. err.	P>z
EQUITY/TA	2.513	4.556	0.581
RWA DENSITY	-1.937	1.440	0.179
GROSS LOANS_TA	4.558	1.302	0.000
NPL RATIO	6.400	1.950	0.001
GROWTH GL	11.421	0.966	0.000
SIZE	0.836	0.117	0.000
LISTED	-7.507	2.984	0.012
BANK ASSET CONCENTRATION	10.441	3.618	0.004
DOMESTIC CREDIT_GDP	19.254	17.423	0.269
GDP GROWTH	-1.211	0.669	0.070
Constant	-23.176	4.291	0.000
Obs	2,043		
R-squared	0.403		

Table A2 - Differences in means before and after matching

The table reports the difference in means for each variable used in the PSM method before and after the matching. "U" refers to the *unmatched* group (i.e., before the matching procedure), "M" refers to the *matched* group (i.e., after the matching procedure). The "Treated" group refers to the banks involved in the M&A in a specific year; "Control" group refers to the banks not involved in a M&A in a specific year. P-value shows the significance of the difference in means. V(T)/V(C) is the variance ratio given by the variance of treated on variance of control.

		Mean			
	Groups	Treated group	Control group	P-value	V(T)/V(C)
EQUITY_TA $_{t-1}$	U	0.0919	0.10328	0.004	0.45*
	M	0.09262	0.09781	0.613	0.22*
RWA_DENSITY $_{t-1}$	U	0.50887	0.5465	0.006	0.55*
	M	0.51012	0.48612	0.356	0.61*
GROSS LOANS_TA $_{t-1}$	U	0.65165	0.64778	0.091	0.59*
	M	0.6494	0.65075	0.972	0.31*
NPL $_{t-1}$	U	0.16686	0.13767	0.000	0.81
	M	0.16645	0.17742	0.993	0.37*
GROWTH_GL $_{t-1}$	U	0.28694	0.06757	0.000	2.54*
	M	0.28537	0.27252	0.366	0.64*
SIZE $_{t-1}$	U	14.45	13.163	0.000	1.2
	M	14.424	14.525	0.671	0.54*
LISTED $_{t-1}$	U	0.0588	0.0029	0.000	.
	M	0.0594	0.0097	1.000	.
BANK ASSET_CONCENTRATION $_{t-1}$	U	0.65811	0.67566	0.001	0.71
	M	0.65843	0.65964	0.982	0.7
DOMESTIC CREDIT GDP $_{t-1}$	U	0.81237	0.83092	0.000	0.57*
	M	0.81188	0.81359	0.851	0.92
GDP_GROWTH $_{t-1}$	U	0.0099	0.0029	0.000	0.27*
	M	0.00988	0.00988	0.995	1.05