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By *Elena* Beccalli, *Ludovico* Rossi, *Andrea Viola*

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Network vs Integrated Organizational Structure of Cooperative Banks: Evidence on the Italian Reform

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Keywords: Cooperative Banks; Banking Efficiency; Organizational Structure; Regulatory Reform
JEL classification: G21; L25

1. Introduction

Two types of organizational structures prevail in European cooperative banking. The *network* organizational structure consists of small individual stand-alone cooperative banks belonging to a network in which they share protection in terms of liquidity and solvency. The *integrated* organizational structure consists of a group of banks in which most of the functions are centralized to the point that some of these entities are among the largest European financial institutions. The functions that are centralized in the *integrated* organizational structure vary from country to country.

Historically, Italian cooperative banks adopted a *network* organizational structure comprised of hundreds of small stand-alone banks. In 2016, the Italian regulator reformed the organizational structure of cooperative banks toward an *integrated* one by creating Cooperative Banking Groups (CBGs).[1] Since the full implementation of the reform in 2018, two CBGs were created by aggregating hundreds of local cooperative banks at the national level.[2] This mandatory shift prompts empirical investigation of the efficiency status of Italian cooperative banks post *versus* pre-reform, by specifically considering four distinctive features: economies of scale, economies of scope, X-inefficiency, and market power. This study is meant to compare cooperative banks against commercial banks (used as an entropy balanced control group) to investigate whether the *integrated* organizational structure improves the efficiency of cooperative banking.

The supervisory authority stated in several addresses that there are two main reasons for adopting an *integrated* organizational structure (Draghi, 2008; Visco, 2015; Visco, 2017; Visco,

[1] The Italian Parliament approved the law 49/2016 to change the Italian banking law (Testo Unico Bancario, TUB), creating a new regulation for cooperative banks.

[2] The two Cooperative Banking Groups (CBGs) are Iccrea Banca and Cassa Centrale Banca.

2018; Visco, 2019). The first reason is to strengthen scale and scope economies by centralizing production and control functions, introducing standardized mechanisms for risk control and liquidity, and strengthening solvency protection. The second reason is to allow cooperative banks to access market financing. Indeed, before the 2007 global financial crisis, Italian cooperative banks relied heavily on self-financing. After the global financial crisis, the self-financing ability of Italian cooperative banks came into question.

Provided that cooperative banks rely primarily on relationship lending (Berger and Udell, 2006) and have a smaller size than the average commercial bank, they are better able to serve small and medium enterprises (SMEs) and families in local areas (Hasan et al., 2017). This is particularly relevant in Italy, where 65% of corporate loans of cooperative banks worth less than €2.5 million in 2021.[3] The conventional paradigm therefore clearly matters: banks with strong relationships with the territory use soft information gathered through relationship lending so that they can be more informed about customers' businesses to make better lending decisions (Berger and Udell, 2006). Thus, small banks should be better able to have less risky and more profitable relationships with small (and opaque) firms by relying on soft information. By contrast, large banks, which operate in multiple markets, tend to be non-local institutions. They rely more on hard information and, therefore, focus less on small businesses (Berger and Udell, 2002 Mudd, 2013; Hasan et al., 2017; Mkhaiber and Werner, 2021).

However prior literature on cooperative banks has not investigated the efficiency of their (heterogeneous) organizational structures, that indeed represents a crucial area (Migliorelli and Lamarque, 2022). This paper aims to fill this gap in the literature. Because the 2016 Italian reform moved from the prior *network* to the new *integrated* organizational structure, an investigation of

[3] We thank Federcasse for providing this statistic.

the effects of the shift becomes relevant. The research questions addressed in this paper are as follows: (i) Does the shift to the *integrated* organizational structure increase economies of scale? (ii) Does it increase economies of scope? (iii) Does it decrease X-inefficiency? And (iv) Does it change the market power of cooperative banks?

We test these hypotheses by matching a sample of 452 Italian cooperative banks (the treated sample) and 223 Italian commercial banks (the control sample) over the period 2006-2019 and performing difference-in-differences regressions. To avoid the effects of the Covid-19 pandemic, we stop the analysis in 2019. Our findings show that before the reform cooperative banks had economies of scale on costs and diseconomies of scale on profits. Due to the change from a *network* organizational structure to an *integrated* one, cooperative banks were better able to exploit scale economies on cost. Indeed, the reform forced cooperative banks to join into CBGs. Each CBG centralizes the management of capital, liquidity, and compliance functions. This allows cooperative banks to exploit costs scale economies, since the centralization of these functions results in a reduction of costs for each single cooperative bank.

Regarding diseconomies of scale on profit, we find an increase after the reform, suggesting that the larger size determined lower marginal profits. Although sharing functions helps cooperative banks in lowering costs, their revenues are often generated thanks to personal relationships among bank managers, local entrepreneurs, and borrowers. This suggests that the change in organizational structure does not imply an improvement in profitability in the first years of the reform implementation.

Also, after the reform, we find an increase in profit economies of scope for cooperative banks, suggesting that cooperative banks experience more advantage from diversification. However, in the same period commercial banks experienced even a larger increase in profit

economies of scope suggesting that, in comparative terms, the reform did not determine a positive effect on profit economies of scope for cooperative banks. Finally, we find no effect of the reform on banks' efficiency and market power. Overall, the reform achieved, although still partially, the aims of the regulator by enabling cooperative banks to exploit cost economies of scale without hurting competition in the banking industry.

The rest of the paper is organized as follows. Section 2 outlines cooperative banks in Europe and Italy, Section 3 develops our model specification concerning the existing literature regarding scale economies, scope economies, X-inefficiency, and estimation of market power for cooperative banks. It also depicts the sample, the matching procedure, and the difference-in-differences strategy. Section 4 discusses the empirical results and provides robustness checks, and Section 5 concludes the paper.

2. Organizational Structures of Cooperative Banks in Europe and Italy

Two different types of organizational structure prevail in Europe: *network* and *integrated* (Cornee et al., 2018). In a *network* organizational structure, cooperative banks work as a group of small individual stand-alone cooperative banks that belongs to a network to share protection in terms of liquidity and solvency.[4] Local banks remain independent in their daily activities and functions are almost entirely decentralized (McKillop et al., 2020).[5] Examples of the *network* organizational structure are, in addition to the former Italian model, Polish and Hungarian cooperative banks (Cornèe et al., 2018).

[4] Articles 400(2)(d) and 422(8) of the Capital Requirements Regulation (CRR).

[5] A central institution (not an Institutional Protection Scheme), owned by local banks, is meant at guaranteeing centralized liquidity management and provide services.

The *integrated* organizational structure is the most common in European countries. Three different *integrated* models are operating in Europe based on the degree of integration. Firstly, the Institutional Protection Scheme (IPS) in which cooperative banks are still largely independent but are tied by arrangements that ensure liquidity and solvency in case of bankruptcy.[6] Local institutions are individually supervised at national levels. Germany, Austria and Spain embrace this model. In Germany, the Bundesverband der Deutschen Volksbanken und Raiffeisenbanken is the IPS with 814 stand-alone cooperative banks, in Austria the Fachverband der Raiffeisenbanken is the IPS with 366 cooperative banks. In Spain, Grupo Caja Rural is the IPS with 29 stand-alone cooperative banks.

Secondly, the Integrated Cooperative Networks (ICN) is a parent-subsidiary relationship between a central institution and local banks.[7] The central institution chooses the managing directors of local entities. The board members of the central institution are chosen by the local banks. Since the size of the conglomerate may be significant, ICNs are mainly supervised by the European Central Bank. This is the case of the French model (Crédit Agricole, Crédit Mutuel, Groupe des Banques Populaires et des Caisses d'Epargne) and the new Italian model made by CBGs.

Thirdly, Consolidated Cooperative Groups (CCG) is the most integrated model.[8] It consists of a consolidated cooperative group where local banks and central bodies are a single entity (even for prudential requirements). In practice, local banks act as if they were branches of the overall

[6] Article 133(7) of the CRR.

[7] Article 113(6) of the CRR.

[8] Article 10 of the CRR.

bank. This model is adopted in Finland (OP-Pohjola), Portugal (Credito Agricola), and Luxemburg (Raiffeisen Luxembourg).

Focusing on Italy, cooperative banks have always played an important role in the banking system. As of 2021, there are around 250 cooperative banks in Italy (representing 52.8% of total banks operating in Italy), around 4,200 branches (18% of total branches) and 1.3 million members. They are mainly focused on providing credit to SMEs (with a loan market share of 25% for small enterprises) and families (10% of loan market share).[9] Their articles of association and the law itself impose them to operate mainly where they are located, serving especially members (50% of credit has to be allocated to members).[10]

Pre-reform (until June 2018), the Italian cooperative banks adopted a *network* organizational structure with three levels. Firstly, at the local level, every individual bank was autonomous in managerial decisions. Secondly, at the regional level, individual banks aggregate in 15 regional or interregional federations. Banks could join federations voluntarily. These federations played an important role in the regional strategies for some fundamental functions, such as transmitting information from national bodies to single banks and providing consulting services. Thirdly, at the national level, all banks aggregate in a single federation (Federcasse). Federcasse offered individual banks legal, fiscal and organizational assistance. It also sets overall strategy and policy guidelines. Moreover, three service providers (Gruppo Bancario Iccrea, Cassa Centrale Banca of Trento, and Cassa Centrale Raiffeisen of Alto Adige) supported cooperative banks with specific services and products such as IT services and payment systems.

[9] https://www.creditocooperativo.it/page/il-credito-cooperativo.

[10] Article 34 of the TUB and Article 35 of the TUB.

The 2007 great financial crisis hit cooperative banks as well as the entire Italian banking system. Whilst the Tier 1 ratio remained at a good level (16.7%), other quality indicators got worse. For example, the gross non-performing loans ratio increased from 10% to 17.5% over the period 2011-2014. This raised concerns regarding the viability of the Italian cooperative system which led to the reform in 2016. The main goals of the reform were first to strengthen scale and scope economies by centralizing production functions and providing stronger liquidity and solvency protection and, secondly, to allow cooperative banks to access financial markets (Visco, 2015; Visco, 2017; Visco, 2018; Visco, 2019). Since July 2018, the vast majority of Italian cooperative banks were integrated into two CBGs, and just few cooperative banks (representing 11% of the population) were aggregated in IPSs.[11]

3. Research Design

3.1 Hypothesis Development

Cooperative banks play a relevant role, especially for families and SMEs that tend to experience more difficulties getting access to traditional commercial banks (Hasan et al., 2017). Many pieces of research show that small local banks are better able to form strong relationships with informationally opaque small businesses, while large non-local banks tend to serve more transparent firms (Berger et al., 2017; Hasan et al., 2017; Mkhaiber and Werner, 2021; Nitani and Legendre, 2021). This is commonly referred to as the "conventional paradigm" (Cole et al., 2004; Berger et al., 2005).

[11] Article 37-bis(1-bis) of TUB specifies that cooperative banks located in provinces of Trento and Bolzano can aggregate in IPSs. Some banks located in Bolzano province created one IPS called "Raiffeisen Sudtirol IPS".

Berger et al. (2017) show that small businesses based in areas with more small banks faced fewer financial constraints. Hasan et al. (2017) find that local cooperative banks contribute to the growth of SMEs by providing credit at a lower cost. Mkhaiber and Werner (2021) find a negative relationship between bank size and the propensity to lend to small businesses. Nitani and Legendre (2021) report that loans advanced by cooperative lenders to small businesses have a significantly lower probability of default than those disbursed by mainstream banks. By contrast, Berger et al. (2014) show that changes in lending technologies and deregulation of the banking industry might change the relationship between small banks and SMEs.

Different pieces of research have investigated the performance (Goddard et al., 2008a; Kontolaimou and Tsekouras, 2010; Becchetti et al., 2016), the ownership structure (Gorton and Schmid, 1999; Ferri et al., 2014), the level of competition and financial soundness (Fiordelisi and Mare, 2014), and the diversification (Mercieca et al., 2007; Goddard et al., 2008b; Lepetit et al., 2008; Mckillop and Wilson, 2011) of cooperative banks. Regarding the efficiency of Italian cooperative banks, Girardone et al. (2004) study cost technical inefficiency and economies of scale over the period 1993-1996, whilst Battaglia et al. (2010) measure technical inefficiency employing cost functions for the period 2000-2005. Moreover, Fiordelisi and Mare (2013) focus on how banks' efficiency impacts their default probabilities. Finally, Coccorese et al. (2016) investigate cooperative banks' network with regard to inner and outer competition, and Coccorese et al. (2020) analyze the impact on cost efficiency of mergers among local cooperative banks over the period 1993-2013 (for about 16 mergers per year).

We expand the existing literature in different dimensions. First, we investigate how a change in the organizational structure of cooperative banks, driven by a regulatory reform, impacts their efficiency. A massive consolidation process occurred, involving 452 cooperative banks in year

2018. Second, prior pieces of research focus on cost efficiency only, while we expand the study by measuring profit efficiency as well. Furthermore, while prior literature focuses on one aspect of bank efficiency at the time, we study economies of scale, economies of scope, technical inefficiency, and the Lerner index at the same time, to have a more complete picture of how the regulation have impacted on bank efficiency.

To fill this gap in the literature, we formulate four hypotheses regarding how the change from the *network* to the *integrated* organizational structure impacts economies of scale (on the cost and the profit side), economies of scope (on the cost and the profit side), X-inefficiency (on the cost and the profit side), and market power of cooperative banks.

Firstly, the shift from a *network* to an *integrated* organizational structure might allow cooperative banks to centralize administrative and compliance costs (Masera, 2019; Poshakwale et al., 2020), thus determining an effect on economies of scale. The literature on scale economies has focused especially on large banks in the US (Gambacorta and van Rixtel, 2013; Mester, 2010; DeYoung, 2010; Inanoglu et al., 2012; DeYoung and Jiang, 2013; Hughes and Mester, 2013; Davies and Tracey, 2014) and in Europe (Beccalli et al., 2015). To our knowledge, just two studies investigate economies of scale on the cost side (Lang and Welzel, 1996; Girardone et al., 2004), both documenting moderate economies of scale for cooperative banks (adopting network organizational structures) over the eighties and nineties, respectively in Germany and Italy. The creation of larger units via the *integrated* organizational structure aims predominantly to influence the cost of banking. The argument is that cooperative banks need to become bigger to exploit economies of scale on the cost side, assuming revenues remain constant. Our first hypothesis relates to how the shift to the *integrated* organizational structure impacts economies of scale:

H_A (hypothesis 1.a): the shift from a *network* to an *integrated* organizational structure allows banks to exploit benefits in terms of scale economies on the cost side for cooperative banks,

H_A (hypothesis 1.b): the shift from a *network* to an *integrated* organizational structure allows banks to exploit benefits in terms of scale economies on the profit side for cooperative banks.

Secondly, the shift from a *network* to an *integrated* organizational structure might allow cooperative banks to diversify their set of activities. Regarding economies of scope, a large body of literature focuses on large US banks providing mixed evidence as to whether the potential benefits of diversification are greater than the costs (Gambacorta and Van Rixtel, 2013).[12] Similarly, for Europe, early studies (Altunbas and Molyneux, 1996; Vander Vennet, 2002) document mixed evidence on cost scope economies. More recently, Beccalli and Rossi (2020) analyze scope economies and document the presence of cost economies of scope and revenue diseconomies of scope for non-cooperative European banks (resulting in overall profit diseconomies of scope), highlighting that both revenue and cost economies of scope tend to increase with bank size. Thus, adapting the evidence on non-cooperative banking to cooperative banking, our second hypothesis relates to how the shift to the *integrated* organizational structure impacts economies of scope:

H_A (hypothesis 2.a): the shift from a *network* to an *integrated* organizational structure leads to a reduction of cost scope diseconomies for cooperative banks,

[12] Early studies found mixed evidence when detecting economies of scope: while, for instance, Clark (1996), Mester (1993), and Pulley & Humphrey (1993) find cost scope economies. Ferrier et al. (1993) and Mitchell and Onvural (1996) find cost diseconomies of scope. Berger et al. (1996) find no evidence of economies or diseconomies of scope. More recently, empirical studies have difficulties in establishing significant and substantial economies of scope in banking (Boot, 2011; Hoenig and Morris, 2012).

H_A (hypothesis 2.b): the shift from a *network* to an *integrated* organizational structure leads to a reduction of profit scope diseconomies for cooperative banks.

Thirdly, the shift from a *network* to an *integrated* organizational structure might allow cooperative banks to implement better managerial practices. Our third hypothesis relates to how the shift to the *integrated* organizational structure impacts X-inefficiency:

H_A (hypothesis 3.a): the shift from a *network* to an *integrated* organizational structure leads to a reduction of cost X-inefficiency for cooperative banks,

H_A (hypothesis 3.b): the shift from a *network* to an *integrated* organizational structure leads to a reduction in profit X-inefficiency for cooperative banks.

Finally, concerning market power, typically proxied by the Lerner index (that is the mark-up that banks can charge on their customers), an *integrated* organizational structure increases the incentives of cooperative banking groups to compete among themselves. Presbitero and Zazzaro (2011) suggest that in Italian provinces where there are more cooperative banks, the increase in competition leads to higher investment in building long-lasting relationships with customers. Thus, the increase in competition allows cooperative banks to exploit more the soft information acquired through relationship lending (Berger et al., 2017; Hasan et al., 2017; Mkhaiber and Werner, 2021; Nitani and Legendre, 2021). Moreover, Beccalli and Rossi (2020) show that a higher level of scope economies is related to a lower level of market power. Since the supervisor set an increase in scope economies as one of the goals of the reform, we can infer that this may happen at the expense of market power as a side effect. Thus, our fourth hypothesis relates to how the shift to the *integrated* organizational structure impacts market power:

H_A (hypothesis 4): the shift from a *network* to an *integrated* organizational structure leads to a decrease in market power for cooperative banks.

3.2 Sample, Variables and Entropy Matching

We collect financial information from 675 Italian banks. Specifically, our database consists of 452 cooperative banks (the treatment group) and 223 commercial banks (the control group). The sample period ranges from 2006 to 2019. Banks' balance sheets data are provided by Federcasse, which is the Italian Cooperative Banks Federation. We include commercial banks as a non-treated group to control for changes in the Italian banking industry that are not caused by the Cooperative banks' reform. Table 1 reports the number of observations of the two groups each year.

Dependent variables capture economies of scale (ES), economies of scope (SCOPE), X-inefficiency (XINEF) and market power (LERNER). We calculate cost (profit) economies of scale as the inverse of the sum of the elasticities of cost (profit) to outputs. We compute cost (profit) economies of scope by calculating whether costs (profits) decrease (increase) when producing many outputs jointly rather than separately (Mester et al. 1993). We measure cost (profit) technical inefficiency by estimating the X-inefficiency term of cost (profit) fixed-effects stochastic frontier models (Greene, 2005). To compute the Lerner Index we measure the difference between marginal revenues and marginal cost, following Shaffer and Spierdijk (2020). Appendix A reports the construction of these measures.

Controls variables include the liquidity ratio calculated as the ratio of cash and cash equivalents to total assets (LR), the ratio of non-performing loans to gross loans (NPL), the cost to income ratio calculated as the ratio of operating cost to operating income (CIR), the equity to asset ratio calculated as the ratio of total equity to total assets (EAR), and the net interest margin calculated as the ratio of the difference between interest income and interest expenses to total assets (NIM). Variables are winsorized at their 1^{st} and 99^{th} percentiles. Panels A and B of Table 2 report summary statistics separately for the two groups of banks.

Cooperative and commercial banks differ over many observable characteristics, both before and after the passage of the reform. For this reason, following Hainmueller (2012), before the regression analysis, we perform an entropy balancing procedure on all control variables (LR, NPL, CIR, EAR, and NIM). The entropy balancing method creates weights so that the average and variance of the control variables in the pre-treatment period are the same between the treated and non-treated sample. The weights obtained in this way are then employed in the regression analysis. Panel C of Table 2 reports summary statistics for the group of commercial banks after entropy balancing. As a robustness test, we match the two samples using a propensity scoring matching (PSM) technique. Specifically, the weights are obtained employing a kernel matching procedure, implementing the default probit framework to estimate the propensity score.

3.3 Difference-in-Differences

To identify the impact of the reform on cooperative banks, we employ the following two-way fixed effects regression (TWFE):

$$Y_{i,t} = \delta Cooperative_i \cdot Reform_t + \beta X_{i,t} + \alpha_i + \alpha_t + \varepsilon_{i,t}\,, \qquad (1)$$

where $Y_{i,t}$ is the dependent variable that varies over banks (i) and years (t). Depending on the hypothesis to be tested, the dependent variable is either ES (hypotheses 1.a and 1.b), SCOPE (hypotheses 2.a and 2.b), XINEF (hypotheses 3.a and 3.b), or LERNER (hypothesis 4).

$Cooperative_i$ is a dummy variable that takes a value of 1 if the bank is a cooperative bank and 0 otherwise, $Reform_t$ is a categorical variable that takes a value of 1 for the years 2016 and 2017, 2 for years 2018 and 2019, and 0 otherwise (the reform was promulgated in year 2016, and became effective in 2018), $X_{i,t}$ is a vector of control variables, α_i is bank fixed effects and α_t is year fixed effects, β is a vector of parameters and δ is the coefficient of interest. When performing

the regression analysis, we apply the weights obtained from the entropy balancing method. We cluster standard errors at the bank level because $Cooperative$ varies at such level.

4. Empirical Findings

4.1 Preliminary Evidence

Table 3 reports the average of ES^C, ES^π, $SCOPE^C$, $SCOPE^\pi$, $XINEF^C$, $XINEF^{\boldsymbol{\pi}}$, and LERNER in three different periods (before the passage of the reform, after the passage of the reform and after its full implementation) for cooperative and entropy balanced commercial banks. Firstly, both cooperative and commercial banks exhibit economies of scale on cost and diseconomies of scale on profit before the passage of the reform. This means that increasing the scale of banks decreases marginal costs for both cooperative and commercial banks. This finding is consistent with the goal of the 2016 reform: by increasing size, cooperative banks experience advantages in their cost structure. Furthermore, in the low-interest rate environment, banks had small profits on their operating activity and are incentivized to increase the volume of loans (Altavilla et al., 2018; Borio and Gambacorta, 2017). Moreover, economies of scale for cooperative banks are higher than for commercial banks. This is because the impact of compliance and administrative costs are, in relative terms, particularly significant for smaller banks (Hughes et al., 2019, Masera, 2019; Poshakwale et al., 2020).

With the passage of the reform, economies of scale get larger for commercial banks but not for cooperative ones. This is reasonable because, in the process of creating the integrated organizational structure, cooperative banks had the opportunity to eliminate duplications of fixed costs. At the same time, cooperative banks experience larger diseconomies of scale than commercial banks. Thus, by looking at how the averages of these variables evolve over time, it

seems to be the case that the reform reduces economies of scale for cooperative banks compared to commercial ones.

Regarding economies of scope, pre-reform cooperative banks have diseconomies of scope on cost and profit while commercial banks have economies of scope on both. Noticeably, after the passage of the reform, the cost diseconomies of scope of cooperative banks get larger. This result suggests that the business areas of a bank are related more to their expertise rather than to their organizational structure. On the opposite, cooperative banks experience economies of scope on the profit side after the implementation of the reform. Instead, regarding X-inefficiency, cooperative and commercial banks seem to be in line and have similar trends over time. Finally, the market power of cooperative banks is higher than the one of commercial banks, supporting the theory that cooperative banks have an advantage in exploiting soft information (Berger and Udell, 2006). With the passage of the reform, this difference increases because the Lerner index of cooperative banks increases while the one of commercial banks decreases.

4.2 Difference-in-Differences Results

Table 4 reports results on scale economies. The effect of the reform materializes in the post-implementation period. Indeed, the coefficient of the interaction term is negative and statistically significant only for the period 2018-2019 both for economies of scale on costs and for economies of scale on profits. This evidence suggests that cooperative banks successfully exploit the margin they had on cost economies of scale before the reform, confirming hypothesis 1.a (i.e. the change in the organizational structure allows banks to exploit the benefits derived from economies of scale). The result on cost economies of scale was expected as it is in line with the objectives of the regulator. Indeed, as cooperative banks pass from a *network* to an *integrated* organizational structure, activities are centralized at the group level. This process removes duplications of fixed

costs related to activities that were previously undertaken by every single cooperative bank in the *network*. Focusing on profit scale economies, as the increase of size given by the creation of banking cooperative groups increases diseconomies of scale. This evidence is possibly explained by the longer period required to observe positive effects on revenues. Therefore, we cannot confirm yet hypothesis 1.b.

Table 5 reports results on economies of scope. There are no statistically significant results on the cost side. Indeed, diseconomies of scope on cost for cooperative banks get smaller and smaller (in absolute terms), this trend is completely in line with the one of commercial banks. Thus, from the cost point of view, the reform does not impact the choice of cooperative banks to diversify their business or not and we cannot confirm hypothesis 2.a. On the profit side, although economies of scope for cooperative banks increase after the implementation of the reform, this increase is smaller than the one of commercial banks. Therefore, in relative terms, the reform of cooperative banks decreased economies of scope on profit. According to this result, cooperative banks would be more profitable if they focus on credit supply rather than diversifying on more outputs, whilst commercial banks have advantages in diversifying their business. This evidence supports the conventional paradigm (Berger and Udell, 2006) which asserts that cooperative banks' business model is based on exploiting soft information in relationship lending, while business diversification would not be beneficial in terms of profits generation. According to this result, cooperative banks would be more profitable if they focus on credit supply rather than diversifying on more outputs. Conversely, commercial banks have advantages in diversifying their business. The findings for cooperative banks are consistent with the stream of literature that asserts, especially during a crisis period, banks should concentrate on the traditional intermediation function (deposits and loans) rather than diversifying their activities and investments (Kim et al.,

2020). Moreover, as shown by Mercieca et al. (2007), small banks (such as cooperative banks) do not have better performances when shifting to non-interest income activities, suggesting that those banks might improve their performances by expanding their resources within their existing business lines where they have distinctive comparative advantages. Thus, we do not confirm hypothesis 2.b. However, it has to be noticed that a change in business model and the possible increase in diversification requires several years, so a statistically significant increase in the scope economies could be obtained over the long period.

Table 6 reports results on X-inefficiency. Although we expected that the shift from the *network* to the *integrated* organizational structure would have decreased the level of X-inefficiency, we find no statistically significant evidence that this happens. This could be because X-inefficiency is more related to managers' skills and expertise, which were not affected by the reform, rather than to the banks' organizational structure. These results do not confirm hypotheses 3.a and 3.b.

Table 7 reports results on market power. We observe that there is an increase in cooperative banks' market power. However, the increase of market power is transitory, and it is concentrated in the years between the passage of the reform of cooperative banks and the creation of CBGs. We can then conclude that the reform of cooperative banks that changes their organizational structure from a *network* to an *integrated* one does not reduce the level of competition in the banking industry. Thus, these results do not confirm hypothesis 4.

Therefore, our findings partially confirm the objectives the regulator had when forcing cooperative banks to move from a *network* to an *integrated* organizational structure.

4.3 Robustness Tests

Appendix B reports the results of robustness tests. We perform three different robustness tests, to check for (i) consistency of our difference-in-differences regression by changing the methodology to obtain weights, (ii) the consistency of our difference-in-differences results by checking for pre-trends effects, and (iii) finally we remove from our sample cooperative banks that adopt an IPSs organizational structure. From Table B.1 to Table B.4, we re-estimate the difference-in-differences regression using weights obtained with a PSM procedure. As for the entropy balancing case, we perform a propensity score matching PSM on the average values of the controls (LR, NPL, CIR, EAR, and NIM) in the pre-reform period. Table B.1 confirms the findings related to economies of scale. Following the implementation of the reform, cooperative banks exploit benefits from economies of scale on costs and profit decrease. Table B.2 confirms the findings related to economies of scope. Following the implementation of the cooperative banks' reform, there are no effects on economies of scope on costs and economies of scope on profit decrease. Table B.3 confirms that there are no effects of the change of operating structure on X-inefficiency. Table B.4 confirm that there is no effect of the change of operating structure on banks' market power.

From Table B.5 to Table B.8, we re-estimate the difference-in-differences including a test for pre-trends. To check the possible presence of pre-trends in the dependent variables do not affect our main results, we include in Equation 1 interactions term between $Cooperative_i$ and time dummies for three years prior to the passage of the reform. Overall, controlling for pre-trend does not change our main results.

From Table B.9 to Table B.12, we re-estimate the difference-in-differences regression by removing cooperative banks that adopt an IPSs organizational structure. This is to check that the effects we find are due to the creation of CBGs. Table B.9 confirms the findings related to economies of scale. Following the implementation of the cooperative banks' reform, the value of

the measures of economies of scale on costs and profit decreased. Table B.10 confirms the findings related to economies of scope. Following the implementation of the cooperative banks' reform, banks that aggregated in CGBs have no effects on economies of scope on costs and their economies of scope on profit decrease. Table B.11 confirms that there are no effects of the change of operating structure on X-inefficiency. Differently from the results in the main analysis, Table B.12 shows that there is an effect of the change of operating structure on banks' market power that adopted a CBG structure.

5. Conclusions

The 2016 regulatory reform of Italian cooperative banks provides a timely case study to investigate the efficiency of different organizational structures. Those banks whose organizational structure was required to change appear natural candidates for a study about the existence of the theoretical advantages associated with the *network* and with the *integrated* forms.

The efficiency of cooperative banks has caught the attention of the public: supervisory authorities and political clout pushed towards aligning the organizational structure of Italian cooperative banks to their European counterparts, moving from a *network* to an *integrated* form to ease the search for scale and scope economies, as well as the access to capital markets. This reform was urgently demanded by the Italian regulator and supervisory authorities since 2008, when Mario Draghi (at the time, Governor of the Bank of Italy) first underlined that cooperative banks needed to enlarge their scale, increase efficiency and strengthen risk management (Draghi, 2008). Moreover, as subsequently stated by Bank of Italy Governor Ignazio Visco, the declared aim of the new legislative framework is indeed to make the cooperative banking system better able to exploit scale economies (Visco, 2015), scope economies (Visco, 2019) and increase efficiency

(Visco 2017), besides being able to get access to the capital market (Visco 2017). This background prompted an empirical analysis regarding the scale and scope economies of cooperative banks.

Banking literature has recently renewed attention beyond scale and scope economies, focusing especially on the national or continental banking system (Beccalli and Rossi, 2020), but not specifically on cooperative banks. This paper aims to fill this gap, which requires particular attention for Italy given the recent reform.

We empirically investigate scale economies, scope economies, X-inefficiency by looking at the cost and the profits side, and lastly evaluate banks' market power (balancing the sample with an entropy balancing methodology). Regarding economies of scale, we find that the reform allowed banks to exploit benefits on the cost side. This relates to the possibility of spreading fixed costs over a larger output, which an *integrated* structure enables. Those costs largely concern regulatory and compliance requirements, well-known as determinants of diseconomies for small banks (Hughes et al., 2019). Similar results are not achieved regarding profit scale economies, maybe due to the longer period required to have an impact. Regarding economies of scope, after the reform we find an increase in profit economies of scope for cooperative banks although smaller than the one for commercial banks, thus suggesting that the reform itself did not determine a positive effect on profit economies of scope for cooperative banks. However, it has to be noticed once again that a change in the business model could require more years to be beneficial in terms of diversification. Finally, the reform does not affect X-inefficiency and market power.

Our findings bring under focus the regulator's push toward the *integrated* organizational form via the creation of new big and diversified players, namely the cooperative banking groups. The move toward the *integrated* structural form allows cooperative banks to exploit cost economies of scale without decreasing banking competition. Once more years of financial

statements will be available beyond the Covid-19 pandemic, further empirical research might evaluate the efficiency status of the post-reform *integrated* organizational structure in the medium- and long-term.

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Table 1: Cooperative and Commercial Banks per Year

This table reports the number of observations of cooperative banks (the treatment group) and commercial banks (the control group) for each year.

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Cooperative	432	437	430	414	406	406	386	375	368	357	334	253	268	256	5,122
Commercial	165	185	187	196	178	160	151	137	129	120	113	95	80	59	1,955
Total	597	622	617	610	584	566	537	512	497	477	447	348	348	315	7,077

Table 2: Summary Statistics

This table reports summary statistics for the variables in the analysis. Panel A displays summary statistics of cooperative banks. Panel B displays summary statistics of commercial banks. Panel C displays summary statistics of commercial banks after entropy balancing. Q is total assets, Q^1 is gross loans, Q^2 is financial assets, C is operating costs, π is operating profits, W^1 is the price of funds that is the ratio of interest expenses to total assets, W^2 is the price of labor that is the ratio of personnel expenses to total assets, W^3 is the price of physical capital that is the ratio of other operating expenses to total assets, P is marginal revenue that is the ratio of operating revenues to total assets, ES^C is cost economies of scale, ES^π is profit economies of scale, $WSCOPE^C$ is cost economies of scope, $WSCOPE^\pi$ is profit economies of scope, $XINEF^C$ is cost X-inefficiency, $XINEF^\pi$ is profit X-inefficiency, LERNER is the Lerner Index, LR is the liquidity ratio calculated as the ratio of cash and cash equivalents to total assets, NPL is the ratio of non-performing loans to gross loans, CIR is the cost to income ratio calculated as the ratio of operating cost to operating income, EAR is the equity to asset ratio calculated as the ratio of total equity to total assets and NIM is the net interest margin calculated as the ratio of the difference between interest income and interest expenses to total assets.

Variable	N. Obs.	Mean	Median	Std. Dev.	Min	Max
Panel A: Cooperative Banks						
Q^1 (Mln. EUR)	5,122	379.700	220.800	542.800	19.110	10,400.000
Q^2 (Mln. EUR)	5,122	122.800	64.280	208.300	0.040	4,483.000
C (Mln. EUR)	5,122	16.640	10.780	21.430	1.150	313.700
π (Mln. EUR)	5,122	1.864	1.333	5.599	-101.200	56.020
W^1	5,122	0.012	0.012	0.007	0.001	0.033
W^2	5,122	0.013	0.012	0.003	0.002	0.031
W^3	5,122	0.010	0.010	0.005	0.003	0.214
P	5,122	0.044	0.042	0.012	0.020	0.242
ES^C	5,122	1.012	1.009	0.020	0.954	1.122
ES^π	4,557	0.768	0.769	0.074	0.438	0.917
$SCOPE^C$	5,122	-0.099	-0.107	0.150	-0.443	0.755
$SCOPE^\pi$	4,557	-0.020	-0.014	0.123	-0.311	0.866
$XINEF^C$	5,116	0.134	0.128	0.042	0.057	0.299
$XINEF^\pi$	4,551	0.728	0.550	0.697	0.000	3.402
LERNER	5,122	0.156	0.168	0.128	-1.128	0.425
LR	5,122	0.007	0.006	0.004	0.000	0.038
NPL	5,122	0.024	0.018	0.022	0.000	0.106
CIR	5,122	0.842	0.803	0.619	-2.465	4.886
EAR	5,122	0.104	0.099	0.041	0.000	0.263
NIM	5,122	0.023	0.022	0.007	0.002	0.042
Panel B: Commercial Banks						
Q^1 (Mln. EUR)	1,955	7,680.000	2,039.000	14,404.000	19.110	66,344.000
Q^2 (Mln. EUR)	1,955	1,340.000	156.700	3,358.000	0.040	15,796.000
C (Mln. EUR)	1,955	616.200	112.000	1,458.000	1.150	6,827.000
π (Mln. EUR)	1,955	37.870	9.334	91.980	-101.200	354.900
W^1	1,955	0.013	0.012	0.008	0.001	0.033
W^2	1,955	0.013	0.012	0.006	0.002	0.031
W^3	1,955	0.028	0.014	0.043	0.003	0.214
P	1,955	0.062	0.050	0.044	0.020	0.242
ES^C	1,955	1.005	0.990	0.044	0.954	1.122
ES^π	1,464	0.619	0.621	0.105	0.438	0.910
$SCOPE^C$	1,955	0.023	-0.025	0.295	-0.452	0.755
$SCOPE^\pi$	1,464	0.284	0.202	0.355	-0.311	0.866

$XINEF^C$	1,931	0.117	0.092	0.081	0.030	0.407
$XINEF^\pi$	1,443	0.769	0.485	0.822	0.000	3.610
LERNER	1,955	0.048	0.115	0.297	-1.128	0.425
LR	1,954	0.008	0.006	0.008	0.000	0.038
NPL	1,951	0.021	0.013	0.024	0.000	0.106
CIR	1,955	0.885	0.794	0.898	-2.465	4.886
EAR	1,955	0.091	0.078	0.054	0.000	0.263
NIM	1,955	0.018	0.018	0.009	0.002	0.042
Panel C: Commercial Banks – Entropy Balanced						
Q^1 (Mln. EUR)	1,951	4,256.000	1,671.000	6,409.000	19.110	66,344.000
Q^2 (Mln. EUR)	1,951	298.000	77.640	728.300	0.040	15,796.000
C (Mln. EUR)	1,951	208.200	89.650	393.500	1.150	6,827.000
π (Mln. EUR)	1,951	29.980	10.880	65.410	-101.200	354.900
W^1	1,951	0.013	0.012	0.008	0.001	0.033
W^2	1,951	0.014	0.014	0.004	0.002	0.031
W^3	1,951	0.016	0.013	0.014	0.003	0.214
P	1,951	0.054	0.051	0.019	0.020	0.242
ES^C	1,951	0.989	0.982	0.027	0.954	1.122
ES^π	1,461	0.616	0.604	0.112	0.438	0.910
$SCOPE^C$	1,951	0.088	0.040	0.257	-0.452	0.755
$SCOPE^\pi$	1,461	0.276	0.209	0.318	-0.311	0.866
$XINEF^C$	1,928	0.116	0.098	0.067	0.030	0.407
$XINEF^\pi$	1,440	0.724	0.479	0.782	0.000	3.610
LERNER	1,951	0.132	0.152	0.180	-1.128	0.425
LR	1,950	0.007	0.006	0.005	0.000	0.038
NPL	1,951	0.025	0.019	0.023	0.000	0.106
CIR	1,951	0.832	0.773	0.754	-2.465	4.886
EAR	1,951	0.108	0.100	0.046	0.000	0.263
NIM	1,951	0.024	0.024	0.007	0.002	0.042

Table 3: Dependent Variables Before and After the Reform Implementation

This table reports the average of ES^C, ES^π, $SCOPE^C$, $SCOPE^\pi$, $XINEF^C$, $XINEF^\pi$, and LERNER. We compute the average for the period before the approval of the reform (2006-2015), for the period after the approval and before the implementation (2016-2017), and for the period after the implementation of the reform (2018-2019). We compute the differences in the averages after the approval, after the implementation and before the approval of the reform (Δ). We calculate t-tests where the null hypothesis is that the average of ES is equal to one for and the averages of SCOPE, XINEFF, LERNER, and Δs are equal to zero. * p<0.10 ** p<0.05 *** p<0.01.

	ES		**SCOPE**		**XINEF**		**LERNER**
	C	$\boldsymbol{\pi}$	**C**	$\boldsymbol{\pi}$	**C**	$\boldsymbol{\pi}$	
Panel A: Cooperative Banks							
Before	1.011***	0.784***	-0.088***	-0.018***	0.134***	0.642***	0.156***
Approved	1.016***	0.745***	-0.167***	-0.066***	0.130***	1.010***	0.136***
Δ (Approved - Before)	0.004***	-0.039***	-0.079***	-0.048**	-0.005**	0.367***	-0.020***
Implemented	1.010***	0.680***	-0.105***	0.011**	0.138***	1.109***	0.182***
Δ (Implemented - Before)	-0.002*	-0.104***	-0.016**	0.029***	0.003	0.466***	0.026***
Panel B: Commercial Banks							
Before	1.004***	0.624***	0.029***	0.289***	0.117***	0.718***	0.062***
Approved	1.012***	0.605***	-0.0238	0.191***	0.117***	0.922***	-0.033
Δ (Approved - Before)	0.009***	-0.020**	-0.052**	-0.097***	0.000	0.204***	-0.094***
Implemented	1.014***	0.577***	0.027	0.342***	0.115***	1.145***	0.009
Δ (Implemented - Before)	0.010***	-0.047***	-0.001	0.054	-0.003	0.428***	-0.053**

Table 4: Economies of Scale

This table reports the estimated coefficients for two-way fixed effects (TWFE) regressions. The dependent variables are cost economies of scale (ES^C) and profit economies of scale (ES^π). $Cooperative$ is a dummy variable which takes a value of 1 if the bank is a cooperative bank and 0 otherwise, $Reform$ is a dummy variable which takes a value of 0 before 2016, 1 for the years 2016 and 2017, and 2 for the years 2018 and 2019. LR is the liquidity ratio calculated as the ratio of cash and cash equivalents to total assets, NPL is the ratio of non-performing loans to gross loans, CIR is the cost to income ratio calculated as the ratio of operating cost to operating income, EAR is the equity to asset ratio calculated as the ratio of total equity to total assets and NIM is the net interest margin calculated as the ratio of the difference between interest income and interest expenses to total assets. The sample period ranges from 2006 to 2019. Before performing the regression analysis, commercial banks and cooperative banks are matched with an entropy balancing procedure. We report robust standard errors clustered at the bank level (in parentheses).
*** p < 0.01; ** p < 0.05; * p < 0.1.

	(1) ES^C	(2) ES^C	(3) ES^π	(4) ES^π
$Cooperative * Reform = 1$	-0.004	-0.003	-0.011	-0.008
	(0.005)	(0.004)	(0.010)	(0.007)
$Cooperative * Reform = 2$	-0.014***	-0.012***	-0.039***	-0.037***
	(0.005)	(0.005)	(0.014)	(0.012)
LR		0.041		-0.833**
		(0.272)		(0.399)
NPL		0.003		0.029
		(0.053)		(0.077)
CIR		-0.000		-0.003
		(0.000)		(0.013)
EAR		0.053*		0.155***
		(0.031)		(0.044)
NIM		0.350**		-0.629*
		(0.159)		(0.342)
Bank FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	7,073	7,072	6,018	6,017

Table 5: Economies of Scope

This table reports the estimated coefficients for TWFE regressions. The dependent variables are cost economies of scope ($SCOPE^C$) and profit economies of scope ($SCOPE^\pi$). $Cooperative$ is a dummy variable which takes a value of 1 if the bank is a cooperative bank and 0 otherwise, $Reform$ is a dummy variable which takes a value of 0 before 2016, 1 for the years 2016 and 2017, and 2 for the years 2018 and 2019. LR is the liquidity ratio calculated as the ratio of cash and cash equivalents to total assets, NPL is the ratio of non-performing loans to gross loans, CIR is the cost to income ratio calculated as the ratio of operating cost to operating income, EAR is the equity to asset ratio calculated as the ratio of total equity to total assets and NIM is the net interest margin calculated as the ratio of the difference between interest income and interest expenses to total assets. The sample period ranges from 2006 to 2019. Before performing the regression analysis, commercial banks and cooperative banks are matched with an entropy balancing procedure. We report robust standard errors clustered at the bank level (in parentheses).
*** p < 0.01; ** p < 0.05; * p < 0.1.

	(1) $SCOPE^C$	(2) $SCOPE^C$	(3) $SCOPE^\pi$	(4) $SCOPE^\pi$
$Cooperative * Reform = 1$	-0.040*	-0.034*	-0.038	-0.031
	(0.021)	(0.019)	(0.026)	(0.022)
$Cooperative * Reform = 2$	-0.048	-0.047	-0.105**	-0.106**
	(0.032)	(0.032)	(0.045)	(0.044)
LR		1.387		1.202
		(0.861)		(1.353)
NPL		-0.582**		-0.659**
		(0.251)		(0.323)
CIR		0.010***		0.007
		(0.003)		(0.068)
EAR		0.146		0.068
		(0.129)		(0.170)
NIM		0.047		2.816
		(0.909)		(1.722)
Bank FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	7,073	7,072	6,018	6,017

Table 6: X-Inefficiency

This table reports the estimated coefficients for TWFE regressions. The dependent variables are cost X-inefficiency ($XINEFF^C$) and profit X-inefficiency ($XINEFF^\pi$). $Cooperative$ is a dummy variable which takes a value of 1 if the bank is a cooperative bank and 0 otherwise, $Reform$ is a dummy variable which takes a value of 0 before 2016, 1 for the years 2016 and 2017, and 2 for the years 2018 and 2019. LR is the liquidity ratio calculated as the ratio of cash and cash equivalents to total assets, NPL is the ratio of non-performing loans to gross loans, CIR is the cost to income ratio calculated as the ratio of operating cost to operating income, EAR is the equity to asset ratio calculated as the ratio of total equity to total assets and NIM is the net interest margin calculated as the ratio of the difference between interest income and interest expenses to total assets. The sample period ranges from 2006 to 2019. Before performing the regression analysis, commercial banks and cooperative banks are matched with an entropy balancing procedure. We report robust standard errors clustered at the bank level (in parentheses).
*** p < 0.01; ** p < 0.05; * p < 0.1.

	(1)	(2)	(3)	(4)
	$XINEFF^C$	$XINEFF^C$	$XINEFF^\pi$	$XINEFF^\pi$
$Cooperative * Reform = 1$	-0.011	-0.007	0.154	0.146**
	(0.010)	(0.008)	(0.169)	(0.073)
$Cooperative * Reform = 2$	-0.002	0.003	-0.128	0.066
	(0.012)	(0.010)	(0.327)	(0.145)
LR		-0.098		5.152
		(0.502)		(7.802)
NPL		0.019		5.983**
		(0.128)		(2.394)
CIR		0.000		3.731**
		(0.001)		(1.681)
EAR		0.186***		2.706***
		(0.067)		(0.886)
NIM		-0.260		-14.119
		(0.455)		(14.100)
Bank FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	7,044	7,043	5,991	5,990

Table 7: Lerner Index

This table reports the estimated coefficients for TWFE regressions. The dependent variable is the Lerner Index (LERNER). $Cooperative$ is a dummy variable which takes a value of 1 if the bank is a cooperative bank and 0 otherwise, $Reform$ is a dummy variable which takes a value of 0 before 2016, 1 for the years 2016 and 2017, and 2 for the years 2018 and 2019. LR is the liquidity ratio calculated as the ratio of cash and cash equivalents to total assets, NPL is the ratio of non-performing loans to gross loans, CIR is the cost to income ratio calculated as the ratio of operating cost to operating income, EAR is the equity to asset ratio calculated as the ratio of total equity to total assets and NIM is the net interest margin calculated as the ratio of the difference between interest income and interest expenses to total assets. The sample period ranges from 2006 to 2019. Before performing the regression analysis, commercial banks and cooperative banks are matched with an entropy balancing procedure. We report robust standard errors clustered at the bank level (in parentheses).
*** p < 0.01; ** p < 0.05; * p < 0.1.

	(1)	(2)
	LERNER	***LERNER***
$\boldsymbol{Cooperative * Reform = 1}$	0.085**	0.068**
	(0.037)	(0.031)
$\boldsymbol{Cooperative * Reform = 2}$	0.065	0.040
	(0.048)	(0.038)
LR		-4.703***
		(1.461)
NPL		-0.866*
		(0.489)
CIR		-0.010
		(0.009)
EAR		-0.935***
		(0.312)
NIM		13.004***
		(1.371)
Bank FE	Yes	Yes
Year FE	Yes	Yes
Observations	7,073	7,072

Appendix A

To estimate ES, SCOPE, XINEF and LERNER we estimate fixed-effects stochastic frontier models (Greene, 2005) employing cost and profit translog functions with two outputs:

$$ln(Y_{i,t}) = \sum_{n=1}^{2} \beta_n \, ln(Q_{i,t}^n) + \frac{1}{2}\sum_{n=1}^{2}\sum_{m=1}^{2} \beta_{n,m} \, ln(Q_{i,t}^n) \, ln(Q_{i,t}^m) + \sum_{n=1}^{3} \rho_n \, ln(W_{i,t}^n)$$
$$+ \frac{1}{2}\sum_{n=1}^{3}\sum_{m=1}^{3} \rho_{n,m} \, ln(W_{i,t}^n) \, ln(W_{i,t}^m) + \sum_{n=1}^{2}\sum_{m=1}^{3} \gamma_{nm} \, ln(Q_{i,t}^n) \, ln(W_{i,t}^m) \quad (A.1)$$
$$+ \alpha_i + \alpha_t + u_{i,t} + v_{i,t} \ ,$$

where $Y_{i,t}$ is either operating costs ($C_{i,t}$) or operating profits ($\pi_{i,t}$) varying over banks (i) and years (t), $Q_{i,t}^1$ is gross loans, $Q_{i,t}^2$ is financial assets, $W_{i,t}^1$ is the cost of funds defined as the ratio of interest expenses to total assets, $W_{i,t}^2$ is the cost of labour defined as the ratio of personnel expenses to total assets, $W_{i,t}^3$ is the cost of physical capital defined as the ratio of operating expenses to total assets, α_i is bank fixed effects, α_t is year fixed effects, $u_{i,t}$ is the X-inefficiency component that follows an exponential distribution, and $v_{i,t}$ is the idiosyncratic white noise component.

β, ρ, and γ are parameters. Symmetry requires $\beta_{n,m} = \beta_{m,n}$, $\rho_{n,m} = \rho_{m,n}$ and $\gamma_{n,m} = \gamma_{m,n}$. Price homogeneity of degree one requires that $\sum_{n=1}^{3} \rho_n = 1, \sum_{m=1}^{3} \rho_{1,m} = 0$, $\sum_{m=1}^{3} \rho_{2,m} = 0$, $\sum_{m=1}^{3} \rho_{3,m} = 0$, $\sum_{m=1}^{3} \gamma_{1,m} = 0$ and $\sum_{m=1}^{3} \gamma_{2,m} = 0$.

Because of the bank-level fixed effects, only banks that have financial information available for more than one year enter in the regression. For this reason, we lose 55 observations.

Economies of Scale

We define cost economies of scale (ES^C) as the inverse of the sum of the elasticities of cost to outputs:

$$ES_{i,t}^{C} = \frac{1}{\frac{\partial\, ln(C_{i,t})}{\partial\, ln(Q_{i,t}^{1})} + \frac{\partial\, ln(C_{i,t})}{\partial\, ln(Q_{i,t}^{2})}}\,, \tag{A.2}$$

and profit economies of scale (ES^{π}) as the sum of the elasticities of profit to outputs:

$$ES_{i,t}^{\pi} = \frac{\partial\, ln(\pi_{i,t})}{\partial\, ln(Q_{i,t}^{1})} + \frac{\partial\, ln(\pi_{i,t})}{\partial\, ln(Q_{i,t}^{2})}. \tag{A.3}$$

According to these definitions, a bank is experiences economies of scale if ES is higher than one, constant economies of scale if ES equal to one, and diseconomies of scale if ES is lower than one.

Economies of Scope

We follow Mester (1993) to construct our measure of scope economies. We define cost economies of scope ($SCOPE^{C}$) as:

$$SCOPE_{i,t}^{C} = \frac{Y(\dot{Q}_{i,t}^{1}; Q_{i,t}^{2,min}) + Y(Q_{i,t}^{1,min}; \dot{Q}_{i,t}^{2}) - Y(Q_{i,t}^{1}; Q_{i,t}^{2})}{Y(Q_{i,t}^{1}; Q_{i,t}^{2})}, \tag{A.4}$$

and profit economies of scope ($WSCOPE^{\pi}$) as:

$$SCOPE_{i,t}^{\pi} = \frac{Y(Q_{i,t}^{1}; Q_{i,t}^{2}) - [Y(\dot{Q}_{i,t}^{1}; Q_{i,t}^{2,min}) + Y(Q_{i,t}^{1,min}; \dot{Q}_{i,t}^{2})]}{Y(Q_{i,t}^{1}; Q_{i,t}^{2})}, \tag{A.5}$$

where $Q_{i,t}^{1,min}$ and $Q_{i,t}^{2,min}$ are the sample minimum values that the two take in our sample outputs and $\dot{Q}_{i,t}^{1}$ and $\dot{Q}_{i,t}^{2}$ are the adjusted output values to avoid introducing distortions in the measure ($\dot{Q}_{i,t}^{n} = Q_{i,t}^{n} - Q_{i,t}^{n,min}$). According to these definitions, a bank experiences economies of scope if SCOPE is higher than zero, constant economies of scope if SCOPE is equal to zero, and diseconomies of scope if SCOPE is lower than zero.

X-Inefficiency

As measure of X-inefficiency, in this paper we employ the technical inefficiency $E(u_{i,t}|v_{i,t})$. $XINEF^{C}$ is obtained when the dependent variable of Equation A.1 is operating cost and $XINEF^{\pi}$ is obtained when the dependent variable of Equation A.1 is operating profit.

Lerner Index

To calculate the Lerner Index, we follow Shaffer and Spierdijk (2020):

$$LERNER_{i,t} = \frac{\mathrm{R}_{i,t} - \sum_{j=1}^{2} \omega_{i,t}^{j} MC_{i,t}^{j}}{\mathrm{R}_{i,t}}, \tag{A.6}$$

where $\mathrm{R}_{i,t}$ is the ratio of operating revenue to the sum of gross loans and financial assets, $MC_{i,t}^{j}$ are the marginal costs of each asset defined as:

$$MC_{i,t}^{j} = \frac{\partial \ln (C_{i,t})}{\partial \ln (Q_{i,t}^{j})} \frac{C_{i,t}}{Q_{i,t}^{j}}, \tag{A.7}$$

and $\omega_{i,t}^{j}$ are weights defined as $\omega_{i,t}^{j} = \frac{Q_{i,t}^{j}}{Q_{i,t}^{1} + Q_{i,t}^{2}}$.

LERNER ranges between 0 and 1. In a perfectly competitive market, Lerner Index takes a value of zero. A positive value represents an oligopolistic or monopolistic market in which banks have a certain degree of market power.

Appendix B

Table B.1: Economies of Scale - Propensity Scoring Matching

This table reports the estimated coefficients for two-way fixed effects (TWFE) regressions. The dependent variables are cost economies of scale (ES^C) and profit economies of scale (ES^π). $Cooperative$ is a dummy variable which takes a value of 1 if the bank is a cooperative bank and 0 otherwise, $Reform$ is a dummy variable which takes a value of 0 before 2016, 1 for the years 2016 and 2017, and 2 for the years 2018 and 2019. LR is the liquidity ratio calculated as the ratio of cash and cash equivalents to total assets, NPL is the ratio of non-performing loans to gross loans, CIR is the cost to income ratio calculated as the ratio of operating cost to operating income, EAR is the equity to asset ratio calculated as the ratio of total equity to total assets and NIM is the net interest margin calculated as the ratio of the difference between interest income and interest expenses to total assets. The sample period ranges from 2006 to 2019. Before performing the regression analysis, commercial banks and cooperative banks are matched with a propensity scoring matching procedure. We report robust standard errors clustered at the bank level (in parentheses).
*** p < 0.01; ** p < 0.05; * p < 0.1.

	(1) ES^C	(2) ES^C	(3) ES^π	(4) ES^π
$Cooperative * Reform = 1$	-0.002	-0.000	-0.004	-0.002
	(0.003)	(0.003)	(0.008)	(0.007)
$Cooperative * Reform = 2$	-0.010**	-0.008*	-0.029***	-0.026***
	(0.005)	(0.004)	(0.011)	(0.010)
LR		0.120		-0.500
		(0.187)		(0.335)
NPL		0.044		0.070
		(0.039)		(0.076)
CIR		-0.001		0.004
		(0.001)		(0.011)
EAR		0.058**		0.140***
		(0.023)		(0.039)
NIM		0.199		-0.764***
		(0.122)		(0.293)
Bank FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	7,073	7,072	6,018	6,017

Table B.2: Economies of Scope - Propensity Scoring Matching

This table reports the estimated coefficients for TWFE regressions. The dependent variables are cost economies of scope ($SCOPE^C$) and profit economies of scope ($SCOPE^\pi$). $Cooperative$ is a dummy variable which takes a value of 1 if the bank is a cooperative bank and 0 otherwise, $Reform$ is a dummy variable which takes a value of 0 before 2016, 1 for the years 2016 and 2017, and 2 for the years 2018 and 2019. LR is the liquidity ratio calculated as the ratio of cash and cash equivalents to total assets, NPL is the ratio of non-performing loans to gross loans, CIR is the cost to income ratio calculated as the ratio of operating cost to operating income, EAR is the equity to asset ratio calculated as the ratio of total equity to total assets and NIM is the net interest margin calculated as the ratio of the difference between interest income and interest expenses to total assets. The sample period ranges from 2006 to 2019. Before performing the regression analysis, commercial banks and cooperative banks are matched with a propensity scoring matching procedure. We report robust standard errors clustered at the bank level (in parentheses).
*** p < 0.01; ** p < 0.05; * p < 0.1.

	(1)	(2)	(3)	(4)
	$\boldsymbol{SCOPE^C}$	$\boldsymbol{SCOPE^C}$	$\boldsymbol{SCOPE^\pi}$	$\boldsymbol{SCOPE^\pi}$
$\boldsymbol{Cooperative * Reform = 1}$	-0.030	-0.030	-0.034	-0.031
	(0.024)	(0.022)	(0.029)	(0.029)
$\boldsymbol{Cooperative * Reform = 2}$	-0.053	-0.054*	-0.114***	-0.115***
	(0.034)	(0.032)	(0.043)	(0.043)
LR		1.319		1.591
		(0.812)		(1.004)
NPL		-0.562**		-0.661**
		(0.256)		(0.326)
CIR		0.011***		-0.007
		(0.003)		(0.070)
EAR		0.198		0.117
		(0.153)		(0.129)
NIM		-0.378		2.407
		(0.877)		(1.588)
Bank FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	7,073	7,072	6,018	6,017

Table B.3: X-Inefficiency - Propensity Scoring Matching

This table reports the estimated coefficients for TWFE regressions. The dependent variables are cost X-inefficiency ($XINEFF^C$) and profit X-inefficiency ($XINEFF^\pi$). $Cooperative$ is a dummy variable which takes a value of 1 if the bank is a cooperative bank and 0 otherwise, $Reform$ is a dummy variable which takes a value of 0 before 2016, 1 for the years 2016 and 2017, and 2 for the years 2018 and 2019. LR is the liquidity ratio calculated as the ratio of cash and cash equivalents to total assets, NPL is the ratio of non-performing loans to gross loans, CIR is the cost to income ratio calculated as the ratio of operating cost to operating income, EAR is the equity to asset ratio calculated as the ratio of total equity to total assets and NIM is the net interest margin calculated as the ratio of the difference between interest income and interest expenses to total assets. The sample period ranges from 2006 to 2019. Before performing the regression analysis, commercial banks and cooperative banks are matched with a propensity scoring matching procedure. We report robust standard errors clustered at the bank level (in parentheses).
*** p < 0.01; ** p < 0.05; * p < 0.1.

	(1)	(2)	(3)	(4)
	$\boldsymbol{XINEFF^C}$	$\boldsymbol{XINEFF^C}$	$\boldsymbol{XINEFF^\pi}$	$\boldsymbol{XINEFF^\pi}$
$\boldsymbol{Cooperative * Reform = 1}$	-0.001	0.002	0.169	0.204***
	(0.007)	(0.007)	(0.119)	(0.069)
$\boldsymbol{Cooperative * Reform = 2}$	0.001	0.005	-0.257	0.022
	(0.010)	(0.010)	(0.274)	(0.144)
LR		0.413		6.498
		(0.380)		(6.492)
NPL		-0.015		6.685***
		(0.082)		(2.031)
CIR		0.002		3.144*
		(0.001)		(1.741)
EAR		0.155***		3.487***
		(0.052)		(1.237)
NIM		-0.463		-20.220
		(0.341)		(14.226)
Bank FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	7,044	7,043	5,991	5,990

Table B.4: Lerner Index - Propensity Scoring Matching

This table reports the estimated coefficients for TWFE regressions. The dependent variable is the Lerner Index (LERNER). $Cooperative$ is a dummy variable which takes a value of 1 if the bank is a cooperative bank and 0 otherwise, $Reform$ is a dummy variable which takes a value of 0 before 2016, 1 for the years 2016 and 2017, and 2 for the years 2018 and 2019. LR is the liquidity ratio calculated as the ratio of cash and cash equivalents to total assets, NPL is the ratio of non-performing loans to gross loans, CIR is the cost to income ratio calculated as the ratio of operating cost to operating income, EAR is the equity to asset ratio calculated as the ratio of total equity to total assets and NIM is the net interest margin calculated as the ratio of the difference between interest income and interest expenses to total assets. The sample period ranges from 2006 to 2019. Before performing the regression analysis, commercial banks and cooperative banks are matched with a propensity scoring matching procedure. We report robust standard errors clustered at the bank level (in parentheses).
*** p < 0.01; ** p < 0.05; * p < 0.1.

	(1)	(2)
	LERNER	***LERNER***
$\boldsymbol{Cooperative * Reform = 1}$	0.076	0.052
	(0.052)	(0.039)
$\boldsymbol{Cooperative * Reform = 2}$	0.067	0.029
	(0.056)	(0.041)
LR		-5.310***
		(1.245)
NPL		-1.132**
		(0.446)
CIR		-0.012
		(0.010)
EAR		-1.154***
		(0.406)
NIM		14.334***
		(1.375)
Bank FE	Yes	Yes
Year FE	Yes	Yes
Observations	7,073	7,072

Table B.5: Economies of Scale - Pre-Trends

This table reports the estimated coefficients for two-way fixed effects (TWFE) regressions. The dependent variables are cost economies of scale (ES^C) and profit economies of scale (ES^π). $Cooperative$ is a dummy variable which takes a value of 1 if the bank is a cooperative bank and 0 otherwise, $Reform$ is a dummy variable which takes a value of 0 before 2016, 1 for the years 2016 and 2017, and 2 for the years 2018 and 2019. α_{2013}, α_{2014}, α_{2015} are time dummies that take values of 1 in the years 2013, 2014, and 2015 respectively, and zero otherwise. LR is the liquidity ratio calculated as the ratio of cash and cash equivalents to total assets, NPL is the ratio of non-performing loans to gross loans, CIR is the cost to income ratio calculated as the ratio of operating cost to operating income, EAR is the equity to asset ratio calculated as the ratio of total equity to total assets and NIM is the net interest margin calculated as the ratio of the difference between interest income and interest expenses to total assets. The sample period ranges from 2006 to 2019. Before performing the regression analysis, commercial banks and cooperative banks are matched with an entropy balancing procedure. We report robust standard errors clustered at the bank level (in parentheses). *** p < 0.01; ** p < 0.05; * p < 0.1.

	(1) ES^C	(2) ES^C	(3) ES^π	(4) ES^π
$Cooperative * Reform = 1$	-0.005	-0.003	-0.007	-0.004
	(0.005)	(0.004)	(0.011)	(0.007)
$Cooperative * Reform = 2$	-0.015***	-0.013***	-0.036**	-0.033***
	(0.006)	(0.005)	(0.014)	(0.012)
$Cooperative * \alpha_{2013}$	-0.004*	-0.003	0.009**	0.010***
	(0.002)	(0.002)	(0.004)	(0.004)
$Cooperative * \alpha_{2014}$	-0.004	-0.003	0.011	0.011
	(0.004)	(0.004)	(0.007)	(0.007)
$Cooperative * \alpha_{2015}$	0.001	0.001	0.018***	0.017***
	(0.002)	(0.003)	(0.005)	(0.005)
LR		0.031		-0.807**
		(0.273)		(0.398)
NPL		-0.000		0.039
		(0.052)		(0.075)
CIR		-0.000		-0.000
		(0.000)		(0.013)
EAR		0.051		0.161***
		(0.031)		(0.043)
NIM		0.345**		-0.554
		(0.161)		(0.349)
Bank FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	7,073	7,072	6,018	6,017

Table B.6: Economies of Scope - Pre-Trends

This table reports the estimated coefficients for TWFE regressions. The dependent variables are cost economies of scope ($SCOPE^C$) and profit economies of scope ($SCOPE^\pi$). $Cooperative$ is a dummy variable which takes a value of 1 if the bank is a cooperative bank and 0 otherwise, $Reform$ is a dummy variable which takes a value of 0 before 2016, 1 for the years 2016 and 2017, and 2 for the years 2018 and 2019. α_{2013}, α_{2014}, α_{2015} are time dummies that take values of 1 in the years 2013, 2014, and 2015 respectively, and zero otherwise. LR is the liquidity ratio calculated as the ratio of cash and cash equivalents to total assets, NPL is the ratio of non-performing loans to gross loans, CIR is the cost to income ratio calculated as the ratio of operating cost to operating income, EAR is the equity to asset ratio calculated as the ratio of total equity to total assets and NIM is the net interest margin calculated as the ratio of the difference between interest income and interest expenses to total assets. The sample period ranges from 2006 to 2019. Before performing the regression analysis, commercial banks and cooperative banks are matched with an entropy balancing procedure. We report robust standard errors clustered at the bank level (in parentheses).
*** p < 0.01; ** p < 0.05; * p < 0.1.

	(1)	(2)	(3)	(4)
	$\boldsymbol{SCOPE^C}$	$\boldsymbol{SCOPE^C}$	$\boldsymbol{SCOPE^\pi}$	$\boldsymbol{SCOPE^\pi}$
$\boldsymbol{Cooperative * Reform = 1}$	-0.054**	-0.050**	-0.037	-0.029
	(0.024)	(0.020)	(0.029)	(0.025)
$\boldsymbol{Cooperative * Reform = 2}$	-0.062*	-0.064*	-0.104**	-0.104**
	(0.034)	(0.033)	(0.046)	(0.046)
$\boldsymbol{Cooperative * \alpha_{2013}}$	-0.061***	-0.061***	-0.036	-0.034
	(0.017)	(0.016)	(0.025)	(0.024)
$\boldsymbol{Cooperative * \alpha_{2014}}$	-0.038***	-0.043***	0.042	0.049
	(0.015)	(0.015)	(0.045)	(0.045)
$\boldsymbol{Cooperative * \alpha_{2015}}$	-0.038**	-0.039**	-0.009	-0.004
	(0.018)	(0.017)	(0.032)	(0.030)
LR		1.115		1.222
		(0.820)		(1.341)
NPL		-0.664***		-0.647*
		(0.244)		(0.333)
CIR		0.010***		0.008
		(0.003)		(0.069)
EAR		0.124		0.072
		(0.125)		(0.171)
NIM		-0.109		2.952*
		(0.909)		(1.690)
Bank FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	7,073	7,072	6,018	6,017

Table B.7: X-Inefficiency - Pre-Trends

This table reports the estimated coefficients for TWFE regressions. The dependent variables are cost X-inefficiency ($XINEFF^C$) and profit X-inefficiency ($XINEFF^\pi$). $Cooperative$ is a dummy variable which takes a value of 1 if the bank is a cooperative bank and 0 otherwise, $Reform$ is a dummy variable which takes a value of 0 before 2016, 1 for the years 2016 and 2017, and 2 for the years 2018 and 2019. α_{2013}, α_{2014}, α_{2015} are time dummies that take values of 1 in the years 2013, 2014, and 2015 respectively, and zero otherwise. LR is the liquidity ratio calculated as the ratio of cash and cash equivalents to total assets, NPL is the ratio of non-performing loans to gross loans, CIR is the cost to income ratio calculated as the ratio of operating cost to operating income, EAR is the equity to asset ratio calculated as the ratio of total equity to total assets and NIM is the net interest margin calculated as the ratio of the difference between interest income and interest expenses to total assets. The sample period ranges from 2006 to 2019. Before performing the regression analysis, commercial banks and cooperative banks are matched with an entropy balancing procedure. We report robust standard errors clustered at the bank level (in parentheses).
*** p < 0.01; ** p < 0.05; * p < 0.1.

	(1)	(2)	(3)	(4)
	$XINEFF^C$	$XINEFF^C$	$XINEFF^\pi$	$XINEFF^\pi$
$Cooperative * Reform = 1$	-0.009	-0.005	0.109	0.178**
	(0.012)	(0.009)	(0.175)	(0.087)
$Cooperative * Reform = 2$	-0.000	0.005	-0.171	0.097
	(0.013)	(0.012)	(0.320)	(0.139)
$Cooperative * \alpha_{2013}$	0.001	0.003	-0.055	0.106
	(0.008)	(0.008)	(0.144)	(0.081)
$Cooperative * \alpha_{2014}$	0.013	0.015	-0.202	0.001
	(0.009)	(0.009)	(0.135)	(0.111)
$Cooperative * \alpha_{2015}$	0.002	0.003	-0.167	0.196
	(0.009)	(0.009)	(0.298)	(0.301)
LR		-0.066		5.317
		(0.520)		(7.743)
NPL		0.032		6.039**
		(0.137)		(2.431)
CIR		-0.000		3.755**
		(0.001)		(1.657)
EAR		0.190***		2.739***
		(0.066)		(0.880)
NIM		-0.226		-13.644
		(0.451)		(13.761)
Bank FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	7,044	7,043	5,991	5,990

Table B.8: Lerner Index – Pre-Trends

This table reports the estimated coefficients for TWFE regressions. The dependent variable is the Lerner Index (LERNER). $Cooperative$ is a dummy variable which takes a value of 1 if the bank is a cooperative bank and 0 otherwise, $Reform$ is a dummy variable which takes a value of 0 before 2016, 1 for the years 2016 and 2017, and 2 for the years 2018 and 2019. α_{2013}, α_{2014}, α_{2015} are time dummies that take values of 1 in the years 2013, 2014, and 2015 respectively, and zero otherwise. LR is the liquidity ratio calculated as the ratio of cash and cash equivalents to total assets, NPL is the ratio of non-performing loans to gross loans, CIR is the cost to income ratio calculated as the ratio of operating cost to operating income, EAR is the equity to asset ratio calculated as the ratio of total equity to total assets and NIM is the net interest margin calculated as the ratio of the difference between interest income and interest expenses to total assets. The sample period ranges from 2006 to 2019. Before performing the regression analysis, commercial banks and cooperative banks are matched with an entropy balancing procedure. We report robust standard errors clustered at the bank level (in parentheses).
*** p < 0.01; ** p < 0.05; * p < 0.1.

	(1)	(2)
	LERNER	***LERNER***
$\boldsymbol{Cooperative * Reform = 1}$	0.081**	0.062*
	(0.039)	(0.034)
$\boldsymbol{Cooperative * Reform = 2}$	0.060	0.034
	(0.050)	(0.041)
$\boldsymbol{Cooperative * \alpha_{2013}}$	-0.008	-0.022
	(0.020)	(0.019)
$\boldsymbol{Cooperative * \alpha_{2014}}$	0.004	0.006
	(0.029)	(0.031)
$\boldsymbol{Cooperative * \alpha_{2015}}$	-0.035	-0.036
	(0.028)	(0.022)
LR		-4.803***
		(1.472)
NPL		-0.892*
		(0.506)
CIR		-0.010
		(0.009)
EAR		-0.939***
		(0.311)
NIM		12.960***
		(1.382)
Bank FE	Yes	Yes
Year FE	Yes	Yes
Observations	7,073	7,072

Table B.9: Economies of Scale – Removing Institutional Protection Scheme

This table reports the estimated coefficients for two-way fixed effects (TWFE) regressions. The dependent variables are cost economies of scale (ES^C) and profit economies of scale (ES^π). $Cooperative$ is a dummy variable which takes a value of 1 if the bank is a cooperative bank and 0 otherwise, $Reform$ is a dummy variable which takes a value of 0 before 2016, 1 for the years 2016 and 2017, and 2 for the years 2018 and 2019. LR is the liquidity ratio calculated as the ratio of cash and cash equivalents to total assets, NPL is the ratio of non-performing loans to gross loans, CIR is the cost to income ratio calculated as the ratio of operating cost to operating income, EAR is the equity to asset ratio calculated as the ratio of total equity to total assets and NIM is the net interest margin calculated as the ratio of the difference between interest income and interest expenses to total assets. The sample period ranges from 2006 to 2019. Before performing the regression analysis, commercial banks and cooperative banks are matched with an entropy balancing procedure. We remove cooperative banks from the province of Bolzano that aggregate into Institutional Protection Schemes. We report robust standard errors clustered at the bank level (in parentheses).
*** p < 0.01; ** p < 0.05; * p < 0.1.

	(1) ES^C	(2) ES^C	(3) ES^π	(4) ES^π
$Cooperative * Reform = 1$	-0.006	-0.004	-0.013	-0.011
	(0.006)	(0.004)	(0.011)	(0.008)
$Cooperative * Reform = 2$	-0.015**	-0.013***	-0.042**	-0.039***
	(0.006)	(0.005)	(0.017)	(0.013)
LR		0.009		-0.946**
		(0.294)		(0.433)
NPL		0.029		0.033
		(0.065)		(0.087)
CIR		-0.000		-0.001
		(0.000)		(0.014)
EAR		0.048		0.150***
		(0.033)		(0.045)
NIM		0.337**		-0.703**
		(0.162)		(0.334)
Bank FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	6,444	6,443	5,413	5,412

Table B.10: Economies of Scope – Removing Institutional Protection Scheme

This table reports the estimated coefficients for TWFE regressions. The dependent variables are cost economies of scope ($SCOPE^C$) and profit economies of scope ($SCOPE^\pi$). $Cooperative$ is a dummy variable which takes a value of 1 if the bank is a cooperative bank and 0 otherwise, $Reform$ is a dummy variable which takes a value of 0 before 2016, 1 for the years 2016 and 2017, and 2 for the years 2018 and 2019. LR is the liquidity ratio calculated as the ratio of cash and cash equivalents to total assets, NPL is the ratio of non-performing loans to gross loans, CIR is the cost to income ratio calculated as the ratio of operating cost to operating income, EAR is the equity to asset ratio calculated as the ratio of total equity to total assets and NIM is the net interest margin calculated as the ratio of the difference between interest income and interest expenses to total assets. The sample period ranges from 2006 to 2019. Before performing the regression analysis, commercial banks and cooperative banks are matched with an entropy balancing procedure. We remove cooperative banks from the province of Bolzano that aggregate into Institutional Protection Schemes. We report robust standard errors clustered at the bank level (in parentheses).
*** p < 0.01; ** p < 0.05; * p < 0.1.

	(1)	(2)	(3)	(4)
	$\boldsymbol{SCOPE^C}$	$\boldsymbol{SCOPE^C}$	$\boldsymbol{SCOPE^\pi}$	$\boldsymbol{SCOPE^\pi}$
$\boldsymbol{Cooperative * Reform = 1}$	-0.043*	-0.036*	-0.049	-0.037
	(0.023)	(0.021)	(0.030)	(0.026)
$\boldsymbol{Cooperative * Reform = 2}$	-0.054	-0.054	-0.128***	-0.126***
	(0.036)	(0.036)	(0.044)	(0.044)
LR		1.551		1.562
		(0.993)		(1.347)
NPL		-0.580**		-0.696**
		(0.277)		(0.326)
CIR		0.009***		-0.006
		(0.003)		(0.073)
EAR		0.121		0.065
		(0.136)		(0.163)
NIM		0.134		3.023*
		(0.826)		(1.558)
Bank FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	6,444	6,443	5,413	5,412

Table B.11: X-Inefficiency – Removing Institutional Protection Scheme

This table reports the estimated coefficients for TWFE regressions. The dependent variables are cost X-inefficiency ($XINEFF^C$) and profit X-inefficiency ($XINEFF^\pi$). $Cooperative$ is a dummy variable which takes a value of 1 if the bank is a cooperative bank and 0 otherwise, $Reform$ is a dummy variable which takes a value of 0 before 2016, 1 for the years 2016 and 2017, and 2 for the years 2018 and 2019. LR is the liquidity ratio calculated as the ratio of cash and cash equivalents to total assets, NPL is the ratio of non-performing loans to gross loans, CIR is the cost to income ratio calculated as the ratio of operating cost to operating income, EAR is the equity to asset ratio calculated as the ratio of total equity to total assets and NIM is the net interest margin calculated as the ratio of the difference between interest income and interest expenses to total assets. The sample period ranges from 2006 to 2019. Before performing the regression analysis, commercial banks and cooperative banks are matched with an entropy balancing procedure. We remove cooperative banks from the province of Bolzano that aggregate into Institutional Protection Schemes. We report robust standard errors clustered at the bank level (in parentheses).
*** p < 0.01; ** p < 0.05; * p < 0.1.

	(1)	(2)	(3)	(4)
	$\boldsymbol{XINEFF^C}$	$\boldsymbol{XINEFF^C}$	$\boldsymbol{XINEFF^\pi}$	$\boldsymbol{XINEFF^\pi}$
$\boldsymbol{Cooperative * Reform = 1}$	-0.012	-0.008	0.236	0.158*
	(0.011)	(0.007)	(0.176)	(0.090)
$\boldsymbol{Cooperative * Reform = 2}$	-0.005	-0.000	0.040	0.101
	(0.012)	(0.010)	(0.335)	(0.167)
LR		-0.077		7.807
		(0.501)		(8.920)
NPL		-0.064		5.848**
		(0.153)		(2.687)
CIR		-0.001		3.378*
		(0.001)		(1.816)
EAR		0.181***		2.702***
		(0.066)		(0.839)
NIM		-0.284		-17.789
		(0.449)		(13.755)
Bank FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	6,415	6,414	5,386	5,385

Table B.12: Lerner Index – Removing Institutional Protection Scheme

This table reports the estimated coefficients for TWFE regressions. The dependent variable is the Lerner Index (LERNER). $Cooperative$ is a dummy variable which takes a value of 1 if the bank is a cooperative bank and 0 otherwise, $Reform$ is a dummy variable which takes a value of 0 before 2016, 1 for the years 2016 and 2017, and 2 for the years 2018 and 2019. LR is the liquidity ratio calculated as the ratio of cash and cash equivalents to total assets, NPL is the ratio of non-performing loans to gross loans, CIR is the cost to income ratio calculated as the ratio of operating cost to operating income, EAR is the equity to asset ratio calculated as the ratio of total equity to total assets and NIM is the net interest margin calculated as the ratio of the difference between interest income and interest expenses to total assets. The sample period ranges from 2006 to 2019. Before performing the regression analysis, commercial banks and cooperative banks are matched with an entropy balancing procedure. We remove cooperative banks from the province of Bolzano that aggregate into Institutional Protection Schemes. We report robust standard errors clustered at the bank level (in parentheses).
*** p < 0.01; ** p < 0.05; * p < 0.1.

	(1)	(2)
	LERNER	***LERNER***
$\boldsymbol{Cooperative * Reform = 1}$	0.090**	0.077**
	(0.042)	(0.033)
$\boldsymbol{Cooperative * Reform = 2}$	0.052	0.029
	(0.050)	(0.038)
LR		-5.129***
		(1.502)
NPL		-1.049*
		(0.572)
CIR		-0.006
		(0.009)
EAR		-0.918***
		(0.344)
NIM		12.610***
		(1.386)
Bank FE	Yes	Yes
Year FE	Yes	Yes
Observations	6,444	6,443

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