The distributional impact of local banking. Evidence from the financial and sovereign-debt crises

Valentina Peruzzi [a], Pierluigi Murro [b,*,1], Stefano Di Colli [c]

[a] *Sapienza University of Rome, Italy*
[b] *LUISS University, Italy*
[c] *Confindustria Research Department, Italy*

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ABSTRACT

This paper investigates whether local cooperative banks played a role in mitigating income inequality within Italian municipalities following the main crises that marked the European landscape from 2008 to 2015, namely the financial and sovereign-debt crises. Our empirical findings indicate that, despite the overall rise in income inequality during the post-crisis periods, municipalities hosting at least one cooperative bank branch experienced a comparatively smaller increase. This mitigating effect on income inequality is not observed in the case of non-cooperative banks. Furthermore, the size of the cooperative banking sector emerged as a significant factor in shaping income distribution: municipalities characterized by larger amounts of cooperative banks loans and deposits displayed lower levels of income inequality. The distributional impact of cooperative banks following the two crises was particularly pronounced in smaller municipalities, and where the degree of financial and industrial development was higher.

1. Introduction

During the past few decades, due to the financial and sovereign-debt crises, and the recession following the COVID pandemic, growing income inequality and poverty within major advanced economies have emerged as issues of primary relevance in the academic and policy debate (Piketty, 2015; Milanovic, 2022; The Economist, 2022). Scholars have identified three main channels through which economic crises may influence income distribution (De Haan and Sturm, 2017; Mussida and Parisi, 2020). First, financial crises usually increase interest rates, restrict credit availability, and disrupt financial flows across regions and nations, thereby eroding savings. Second, the post-crisis implementation of austerity measures might limit income support and social welfare provisions, potentially amplifying economic disparities and pushing poverty rates upwards. Third, a decline in aggregate demand could lead to reduced incomes and real wages, thus fostering job losses and unemployment. Fig. 1 shows the evolution of the Gini index in the country examined in this paper, Italy, from 2003 to 2019. As expected, income inequalities substantially increased following both the 2008 financial downturn and the 2012 sovereign-debt crisis.

Extensive evidence shows that well-functioning financial systems can promote economic growth and alleviate poverty and income inequality at the local level (King and Levine, 1993; Beck and Levine, 2004; Calcagnini et al., 2019; Ayyagari et al., 2020). By reducing asymmetric information, which is usually more pronounced among the poor, financial intermediaries enhance
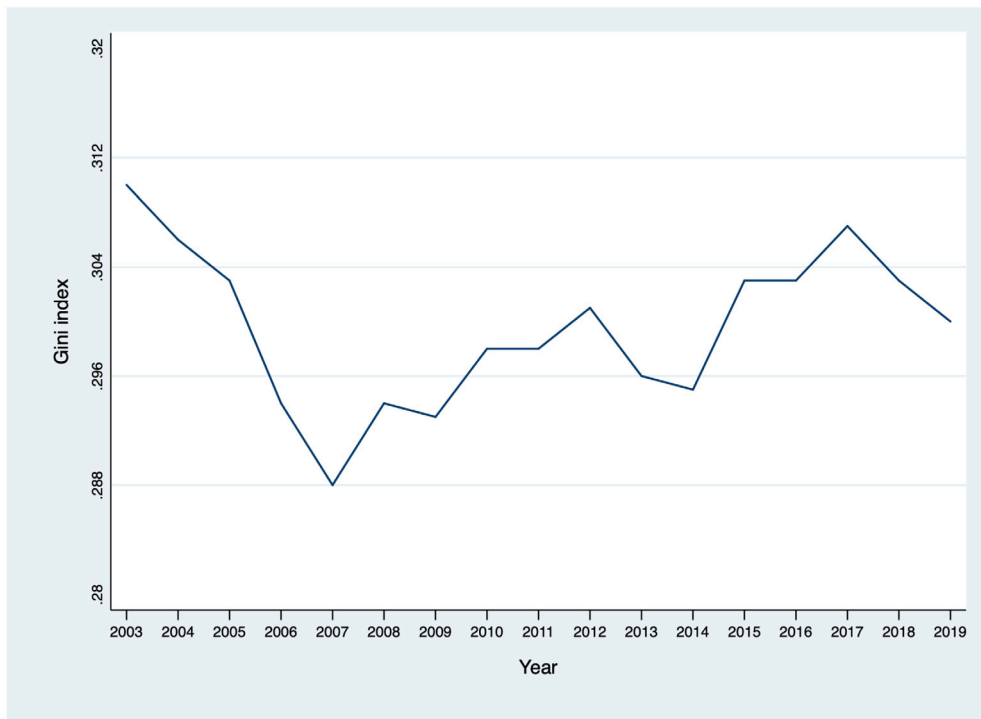
Fig. 1. Income inequality in Italy. Notes: The figure reports the evolution of the Gini coefficient in Italy for the years 2003–2019. *Source:* ISTAT EU-SILC.

the allocation of resources toward this segment of the population, yielding significant effects on their educational level and entrepreneurial prospects (Guiso et al., 2004; Beck et al., 2010; D'Onofrio et al., 2019). Among financial institutions, local cooperative banks stand out as the most effective in yielding such effects, particularly in more advanced economies (Coccorese and Shaffer, 2021; Minetti et al., 2021). In fact, cooperative banks are financial institution that operate based on the principles of cooperative ownership and democratic governance. Most notably, in contrast to traditional banks, which focus on generating profits for shareholders, cooperative banks prioritize the financial well-being of their members and the development of their local communities (Fiordelisi and Mare, 2014; Becchetti et al., 2016).

The aim of this paper is to contribute to this strand of research by investigating whether cooperative banks, due to their distinct characteristics and orientation, can mitigate income inequality following a period of crisis. Because of their reduced size and widespread presence in smaller municipalities, cooperative banks are the primary funding providers for households and small businesses. By relying on relationship lending and offering a wide range of financial and non-financial services, these banks create robust connections with the community where they operate, thereby mitigating asymmetric information problems and enhancing financial inclusion (Angelini et al., 1998; Ferri et al., 2014, 2019). Furthermore, their commitment to supporting local communities favors the reinvestment of a substantial portion of their profits back into the region. Anecdotal evidence highlights the active involvement of cooperative banks in financing disadvantaged borrowers and small and social entrepreneurial activities. On the household side, they disproportionately allocate funds for mortgages to young couples and individuals with unstable employment. On the firm side, cooperative banks notably participate in the public guarantee fund for small and medium-sized enterprises (SMEs), thereby fostering small entrepreneurial initiatives that might otherwise remain underfunded, including women-led firms and social cooperatives (Minetti et al., 2021).

To perform our empirical investigation, we examine Italian municipal data on income distribution and presence of cooperative banks during and after the two main crises that characterized the European landscape between 2008 and 2015, i.e. the financial and sovereign-debt crises. Specifically, we exploit very detailed data coming from four main sources: (i) the Department of Finance of the Italian Ministry of Economics and Finance, from which we hand-collected and elaborated income data; (ii) the private statistical database of Federcasse, the Italian federation of cooperative banks, which provides municipal-level information on the distribution of cooperative bank branches, as well as data on loans and deposits; (iii) the Italian National Statistics Office (Istat) and (iv) the Statistical Bulletin of the Bank of Italy, yielding conditioning information at the municipal level.

The estimation results indicate that, despite the rise in income inequality following the occurrence of both crises, municipalities characterized by the presence of cooperative banks exhibited a comparatively smaller increase. To be more precise, in municipalities with at least one cooperative bank branch, the Gini index after the financial crisis experienced a reduction of 3.1% compared to municipalities without any branches of cooperative banks. This reduction corresponds to approximately 8% of the average Gini index

within the sample. The mitigating impact of cooperative banks was notably more pronounced in the aftermath of the sovereign-debt crisis. During this period, Italian municipalities characterized by the presence of cooperative bank branches saw a decline in the Gini index exceeding 8.5%, in comparison to municipalities without such branches. This reduction amounts to about 21% of the average Gini index within the sample. All these findings remain consistent when we shift our focus from the mere presence of cooperative banks to the assessment of the number of cooperative bank branches per capita. In contrast, the distributional impact of banks turns out to be statistically non-significant when we consider other types of financial institutions, namely non-cooperative banks. This suggests that the mitigation of income inequality after the two crises was not solely determined by the level of banking development, but rather by the specific nature and orientation of cooperative banks. Furthermore, the size of the cooperative banking system played a role in the aftermath of the recessions. In areas where cooperative banks extended more loans and collected more deposits, income inequality after the two crises resulted to be reduced.

The analysis then explores the channels through which cooperative banks can influence income distribution following a crisis period. Specifically, guided by insights from prior literature and supported by anecdotal evidence regarding the initiatives fostered by cooperative banks, we concentrate on factors potentially influenced by the cooperative banking system and likely to affect income inequality. We focus on the municipal level of urbanization, industry structure (measured by the number of local productive units), financial development (proxied by the extent of deposits and loans extended to both businesses and households), and judicial efficiency (measured by the number of pending processes per judge). The findings indicate that the impact of cooperative banks on income distribution after a crisis period holds particular significance in smaller municipalities with elevated levels of industrial and financial development. On the contrary, the degree of judicial efficiency does not seem to play a role.

In providing these findings, we contribute to three main strands of the existing literature. First, we add to the literature on banking development and income inequality, and more specifically to the studies examining the influence of local banks on income distribution. Our work complements the conclusions drawn by D'Onofrio et al. (2019), Minetti et al. (2021) and Coccorese and Dell'Anno (2022), all of which use Italian provincial data to illustrate how local banking development effectively mitigates income inequality during normal periods. In this paper, employing more detailed private data encompassing not only the presence of cooperative banks but also the extent of deposits and loans extended in each municipality, we investigate the distributional effect of local banks after a crisis period. While the presence of bank branches serves as a measure of financial service availability at the local level, bank deposits and loans serve as proxies for financial inclusion and access to credit. Thus, the inclusion of these variables greatly enhances our understanding of the mechanisms driving the distributional impact of cooperative banks in a post-crisis period. Moreover, the use of municipal-level data allows us to capture cooperative banks' behavior, which usually has a very local impact and may not be observed through more aggregated analyses. To the best of our knowledge, we are the first to highlight the capacity of local banks to contribute to post-crisis recovery by alleviating income inequality and poverty. Second, our study enriches the literature on the real effects of cooperative banks. More specifically, we contribute to Ferri et al. (2014, 2019), which underscore how local banks alleviated credit constraints for firms operating in European regions during the last financial crisis. In addition, we align with the findings of Coccorese and Shaffer (2021), whose work highlights the association between cooperative banks and improved local economic performance. Finally, we add to the studies on the distributional effects of crises. In particular, we contribute to the works of Li and Yu (2014), Atkinson and Morelli (2011), and De Haan and Sturm (2017), all of whom illustrate a positive causal relationship between financial crises and income inequality.

Investigating the distributional impact of cooperative banks holds particular relevance within the Italian context. With a relatively low stock market capitalization, the Italian financial system is dominated by the banking sector, and businesses heavily rely on banks for external financing (Minetti et al., 2021). Most importantly from our perspective, cooperative banks play a pivotal role among financial institutions. As reported by Becchetti et al. (2016), in 2010, cooperative banks accounted for about one third of deposits, loans, and branches of the whole Italian banking system.

The remainder of the paper is organized as follows. Section 2 reviews the current literature on the finance-inequality nexus and the role played by the cooperative banking system. Section 3 presents the data and the methodology used to perform the empirical investigation. Section 4 discusses the main findings. Section 5 investigates the mechanisms behind the distributional impact of cooperative banks. Section 6 concludes.

2. Related literature

In order to provide a better understanding of the distributional impact of cooperative banks after a crisis period, in this section we briefly review the current literature on the finance-inequality nexus (2.1) and discuss the role of cooperative banks in the financial system both during normal and crisis times (2.2).

2.1. Financial development and income inequality

Financial markets and institutions perform critical functions within the economic system. They reduce transaction costs and mitigate asymmetric information, offer ways of transferring resources across time, borders, and sectors. In addition, they help firms and individuals in managing uncertainty through the hedging, pooling, and pricing of risk (King and Levine 1993; Beck and Levine, 2004). In a broader sense, financial development facilitates an efficient allocation of financial resources. The theoretical literature has identified different channels through which well-functioning financial markets and intermediaries can mitigate income inequality. First, financial development may allow low-income individuals to invest in education, thereby enabling them to pursue more remunerative employment opportunities (Galor and Zeira, 1993; Aghion and Bolton, 1997; Galor and Moav, 2004). Second,

by mitigating asymmetric information problems, banks may decrease collateral requirements and borrowing costs, thus promoting entrepreneurship and new firm creation (Banerjee and Newman, 1993). Third, the development of the financial system may alter the distribution of income through an increased labor demand by firms, which may benefit low-income employees (Beck et al., 2010).

The empirical literature has extensively tested these theoretical predictions. Drawing from data on 49 developed and developing countries during 1947–1994, Li et al. (1998) offer supportive evidence for the reduction of income inequality through financial development. Clarke et al. (2006) further confirm this result by investigating the relationship between financial development and income inequality for a sample of 83 countries from 1960 to 1995. The study reveals that inequality diminishes with an enhanced efficiency in the financial system. Expanding the temporal horizon to 2005 and analyzing 72 countries, Beck et al. (2007) show that banking development strongly decreases income inequality and disproportionately raises the income of the poorest quintile of the distribution. More recent papers have adopted country-level analyses to mitigate the risk of omitted variables bias. Beck et al. (2010) report that the bank deregulation in the U.S. tightened the income distribution by increasing incomes in the lower tail. Closer to our study, D'Onofrio et al. (2019), examining Italian provinces during 2001–2011, reveal how banking development mitigates income inequality in relatively advanced areas by affecting geographical mobility and population density. Similar results are provided by Coccorese and Dell'Anno (2022), which explore income distribution within Italian provinces in more contemporary years. The aim of this paper is to contribute to this strand of literature by examining the distributional effects of banking development, with a specific focus on the distinctive role played by cooperative banks, in the aftermath of the financial and sovereign-debt crises.

Only a limited number of studies have analyzed the relationship between crises and income inequality. Baldacci et al. (2004) demonstrate a positive impact of currency crises on the Gini index, while Li and Yu (2014) report analogous findings for banking crises. Through an examination of various crises, Atkinson and Morelli (2011) also identify a tendency for income inequality to increase following banking crises. Finally, De Haan and Sturm (2017), utilizing a sample of 121 countries spanning 1975–2005, suggest a positive causal relationship between financial crises and income inequality. In this paper, we investigate whether cooperative banks can mitigate the increase in income inequality following a crisis. In the subsequent subsection, we delve into the distinctive characteristics of these banks and provide an overview of the main empirical studies on the influence of cooperative banks on the real economy during both regular and crisis periods.

2.2. The specificity of cooperative banks

Cooperative banks differ from other credit institutions across various dimensions (Ferri et al., 2014; Fiordelisi and Mare, 2014; Becchetti et al., 2016). First, their ownership is non-transferable, limited to individual equity shares, and redeemable only at face value. In addition, due to their inherent local orientation, cooperative banks establish profound connections with the communities they serve, so that their members are also their main customers. Second, concerning control and governance structure, the defining feature of cooperative banks lies in the "one-member one-vote" rule, independent of the amount of capital owned. This translates to members being unable to accrue votes by subscribing to additional shares. Finally, and of crucial importance in our context, cooperative banks strive to maximize shareholders' value, while also aiming to foster economic growth within the territory where they operate. These objectives are pursued through the provision of diverse products and services, coupled with a regular distribution of dividends.

From a theoretical point of view, the objectives and attributes of cooperative banks offer some potential advantages. The small size and local orientation of these banks are expected to mitigate information asymmetries between lenders and borrowers (Petersen and Rajan, 1994; Berger and Udell, 1995). Indeed, credit institutions actively engaged in the life of a community could establish connections that enable them to gather information that would be prohibitively costly for external parties. Such information could be employed to bolster lending activities, thus promoting greater access to credit and ultimately reducing income inequality. Berger et al. (2004) confirm the presence of a comparative advantage held by small banks in extending loans to firms with limited information transparency. By engaging in relationship lending, small local banks have the potential to gather unique information by establishing connections with the firm's owner, its suppliers and customers, as well as the local community (Murro and Peruzzi, 2022). This, in turn, can strengthen the firm's access to credit and contribute to its future growth potential. Various studies confirm this view, revealing that larger banks allocate a notably minor portion of their assets to loans for SMEs when compared to their smaller counterparts. Moreover, the ratio of SME loans to assets experiences a decline following mergers and acquisitions involving larger banks (Peek and Rosengren, 1998; Strahan and Weston, 1998). Using sector-specific data, Cannari and Signorini (1997) show that in Italy, the availability of credit is more substantial for cooperative banks' customers than for comparable groups of borrowers.

The impact of cooperative banks on economic growth and income distribution has been demonstrated in the works of Coccorese and Shaffer (2021) and Minetti et al. (2021). Focused on Italian provinces in the period 2001–2011, these studies underscore a favorable influence of cooperative banks on real economic outcomes, including employment, firms' growth rates, income inequality, and poverty. This paper aims to make a valuable contribution to this body of literature by examining whether cooperative banks, in comparison to other credit institutions, exhibit greater efficacy in influencing income distribution and alleviating inequality and poverty in the aftermath of a crisis. Existing evidence highlights the protective role of cooperative banks at the peak of the global financial crisis. Ferri et al. (2019) demonstrate that, thanks to their reliance on relationship lending and the use of soft information, local banks refrained from reducing credit to their borrowers during the crisis, a step taken by other types of financial intermediaries. The commitment to protect and support the communities where they operate, coupled with their ability to reduce information asymmetries even in periods of heightened uncertainty such as a financial turmoil, makes cooperative banks as potent agents in fostering post-crisis recovery.

Table 1
Variable definitions.

Variable	Description and source
Dependent variables:	
Gini index	Gini index at the municipal level, computed starting from income data (MEF).
Ratio of the 90th and 10th percentiles of income	Ratio between the income at the 90th and 10th percentiles of the distribution (MEF).
Income at the 10th percentile	Income at the 10th percentile of the distribution (MEF).
Income at the 25th percentile	Income at the 25th percentile of the distribution (MEF).
Independent variables:	
Coop bank branches (0/1)	Dummy variable equal to one if there is at least one cooperative bank branch in the municipality, and zero otherwise (Federcasse).
Other bank branches (0/1)	Dummy variable equal to one if there is at least one non-cooperative bank branch in the municipality, and zero otherwise (Federcasse).
Coop bank branches per capita	Number of cooperative bank branches in the municipality (per 1000 inhabitants) (Federcasse).
Other bank branches per capita	Number of other bank branches in the municipality (per 1000 inhabitants) (Federcasse).
Coop bank deposits per capita	1+log of the deposits with cooperative banks in the municipality per 1000 inhabitants (Federcasse).
Coop bank loans per capita	1+log of the loans granted by cooperative banks in the municipality per 1000 inhabitants (Federcasse).
Other bank deposits per capita	1+log of the deposits with non-cooperative banks in the municipality per 1000 inhabitants (Federcasse).
Other bank loans per capita	1+log of the loans granted by non-cooperative banks in the municipality per 1000 inhabitants (Federcasse).
Post-crisis	Dummy variable equal to one in the years 2010–2011 (for the financial crisis) and 2014–2015 (for the sovereign crisis), and zero otherwise (2008–2009 and 2012–2013).
Control variables:	
Population (log)	Resident population in the municipality, in logarithm (ISTAT).
Productive units (log)	Local productive units in the municipality, in logarithm (ISTAT).
Bank branches per capita	Number of bank branches in the municipality, normalized by the population (Bank of Italy).
Share population 0–24y	Share of population with 0–24 years in the municipality (ISTAT).
Share population 25–44y	Share of population with 25–44 years in the municipality (ISTAT).
Share population 45–64y	Share of population with 45–64 years in the municipality (ISTAT).
Share of tax payers	Number of tax payers in the municipality, normalized by the population. (ISTAT)
Instrumental variables:	
Popular banks in 1936	Number of popular bank branches in 1936 in the province (per 100,000 inhabitants) (Bank of Italy).
Number of branches in 1936	Number of bank branches in 1936 in the province (per 100,000 inhabitants) (Bank of Italy).

3. Data and empirical methodology

3.1. Data sources and measurement

The data used in the empirical analysis come from four main sources: (i) the Department of Finance of the Italian Ministry of Economics and Finance; (ii) the private statistical database of Federcasse, which is the Italian federation of cooperative banks; (iii) the Italian National Statistics Office (Istat); and (iv) the Statistical Bulletin of the Bank of Italy. Specifically, we initially collected and elaborated data from the municipality-level database on tax revenue compiled by the Italian Ministry of Economics and Finance. Then, we obtained information about the presence of cooperative bank branches, the amount of bank loans, and deposits per municipality from Federcasse. Additionally, we acquired conditioning information from the Italian National Statistics Office and the Statistical Bulletin of the Bank of Italy (see Table 1 for the definition and the source of all variables).

As municipal-level data of income distribution are not available, we calculated them based on the income data. We downloaded spreadsheets from the Department of Finance website, which provided information on the distribution of taxable income for each of the 8056 Italian municipalities over the 2008–2015 period. For each municipality and year, we had the frequency and the average income of 8 income classes. Using this information, we computed the indicators commonly used in the literature on inequality. First, we derived the Gini coefficient of income distribution from the Lorenz curve. The Gini coefficient equals 0 if everyone has the same income, and it equals 1 if a single individual receives the income of the entire municipality. Therefore, larger values of the Gini indicator imply greater income inequality. Then, as an alternative measure of income distribution, we examine the ratio between the incomes of those at the 90th percentile and those at the 10th percentile. Lastly, we consider two inverse measures of poverty, represented by the logarithm of incomes of those at the 10th and 25th percentiles.

Following the literature on local banking development and economic growth, we employ different measures of the local banking structure. First, to study the impact of the presence of local banks on income inequality, we use a dummy variable that takes the value of one if there is at least one cooperative bank branch in the municipality, and zero otherwise (*Coop bank branches (0/1)*) and a continuous variable given by the number of cooperative bank branches per 1000 inhabitants (*Coop bank branches per capita*). Subsequently, to investigate whether the size of the cooperative banking system plays a role, we consider the amount of loans (*Coop bank loans per capita*) and deposits (*Coop bank deposits per capita*) of cooperative banks in the municipality per 1000 inhabitants.

Table 2
Summary statistics.

	Observations	Mean	Std. Dev.	Min	Max
Dependent variables:					
Gini index	62,543	0.397	0.029	0.172	0.754
Ratio of the 90th and 10th percentiles of income	62,543	6.357	1.359	2.742	30.365
Income at the 10th percentile	62,543	5017.118	413.611	2004.157	12500
Income at the 25th percentile	62,543	6472.190	3032.625	2004.157	20 465.714
Independent variables:					
Coop bank branches (0/1)	62,543	0.331	0.470	0	1
Other bank branches (0/1)	62,543	0.660	0.473	0	1
Coop bank branches per capita	62,543	0.113	0.283	0	0.579
Other bank branches per capita	62,543	0.393	0.457	0	0.880
Coop bank deposits per capita	62,543	2.618	3.816	0	11.315
Coop bank loans per capita	62,543	2.709	3.944	0	11.313
Other bank deposits per capita	62,543	5.754	4.182	0	14.382
Other bank loans per capita	62,543	5.754	4.206	0	13.704
Control variables:					
Population	62,542	7663.436	42 723.086	29	2873494
Productive units/1000 inhabitants	56,048	6706.204	2403.967	0	37 788.019
Bank branches per capita	62,542	0.002	0.028	0	2.207
Share of population 0–24 y	62,542	0.222	0.039	0.020	0.409
Share of population 25–44 y	62,542	0.252	0.034	0.045	0.519
Share of population 45–64 y	62,542	0.288	0.025	0.077	0.633
Share of population >65 y	62,542	0.236	0.057	0.044	0.689
Share of tax payers	62,542	0.989	0.881	0.018	2.830
Instrumental variables:					
Popular banks in 1936	62,543	0.707	0.636	0	2.679
Number of branches in 1936	62,543	20.231	10.340	3.668	61.777

Notes: The table reports summary statistics for the variables employed in the empirical analysis. All of the variables are defined in Table 1.

The same variables are also computed for non-cooperative banks.[2] While the presence of cooperative and non-cooperative bank branches may measure the availability of financial services in the municipality, bank deposits and loans may be considered proxies of financial inclusion and credit availability. Therefore, the adoption of all these variables may provide useful insights into the mechanisms driving the distributional impact of cooperative banks in a post-crisis period.

Finally, as conditioning information, we use a comprehensive set of control variables. Information about the population size, the distribution of the population among different age classes, the number of productive units, and the number of taxpayers is obtained from the Istat database. Additionally, data on the municipal number of bank branches are obtained from the Statistical Bulletin of the Bank of Italy. It is important to emphasize that the use of municipal data, the most disaggregated level available from official sources, allows us to reveal patterns in the dynamics of income distribution potentially masked by greater aggregation. This issue is particularly relevant in analyzing cooperative banks, which, as discussed in the previous section, usually operate and produce effects at a very local level.

Table 2 displays summary statistics for the variables employed in the empirical analysis. The figures reveal that the average income inequality, measured by the Gini index, is equal to 0.397. The table also shows that 33.1% of the Italian municipalities have at least one branch of a cooperative bank, that the average amount of loans at the municipal level from cooperative banks is 52 million euros, while the average amount of deposits is 39 million euros. In comparison to cooperative banks, other banks appear to be more present in the Italian territory, with 66% of Italian municipalities hosting at least one non-cooperative bank branch. Fig. 2 displays a map of the Italian municipalities by the presence of cooperative bank branches (Fig. 2a) and the value of the Gini coefficient (Fig. 2b) in 2011. As can be noted, northern municipalities have both the highest presence of cooperative bank branches and the lowest value of the Gini index.

3.2. Econometric specification

To assess the impact of cooperative banks on income inequality in Italian municipalities after the financial and sovereign debt crises, we employ a difference-in-differences (DID) panel fixed effects estimation technique. Our baseline model is as follows:

$$Y_{it} = \alpha_1 + \beta_1 Coop\_bank\_branches_{it} + \gamma_1 Post\_crisis_t$$
$$+ \delta_1 Coop\_bank\_branches_{it} \times Post\_crisis_t + X_{it} + \mu_i + \mu_t + \epsilon_{it} \tag{1}$$

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[2] In additional robustness tests reported in Table A.1, we experiment using alternative measures of cooperative (*Coop bank branches per Km^2*, *Coop bank loans per Km^2*, and *Coop bank deposits per Km^2*) and other bank branches (*Other bank branches per Km^2*, *Other bank loans per Km^2*, and *Other bank deposits per Km^2*) built by combining information on cooperative banks and data on land area per municipality. These measures aim to control for transaction costs of visiting the bank, as inspired by Fafchamps and Schündeln (2013).

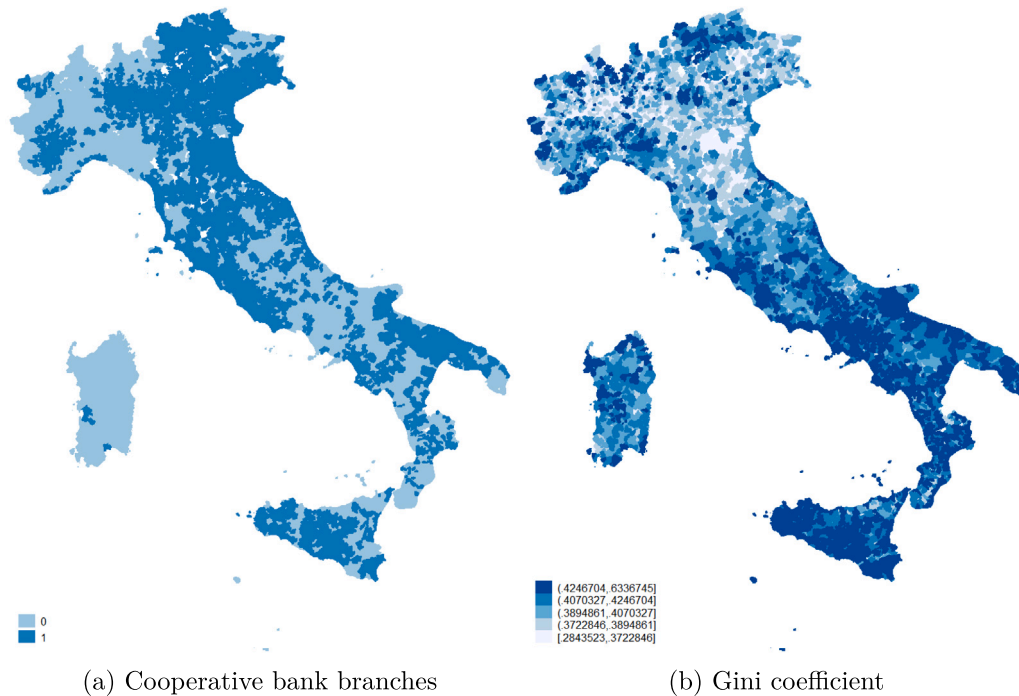(a) Cooperative bank branches   (b) Gini coefficient

Fig. 2. Cooperative banks and income inequality across Italian municipalities.
Notes: The maps show the presence of cooperative bank branches and the Gini coefficient (classified in quintiles) in 2011 in Italian municipalities.
Source: Our calculations based on data from Federcasse and the Department of Finance of the Italian Ministry of Economics and Finance.

where Y_{it} is the Gini coefficient in municipality i at time t; $Coop\_bank\_branches_{it}$ measures the presence of cooperative banks in municipality i at time t; $Post\_crisis_t$ is a dummy variable equal to one in the two years following the financial and sovereign debt crises (i.e. in 2010–2011 and 2014–2015), and zero otherwise (2008–2009 and 2012–2013);[3] X_{it} is a vector including municipal-level control variables; μ_i and μ_t are municipality and time fixed effects; ϵ_{it} is the error term. In additional regressions, we also explore the impact of non-cooperative banks on income inequality after the two crises by adding the variable $Other\_bank\_branches_{it}$ and the interaction term $Other\_bank\_branches_{it} \times Post\_crisis_t$.[4]

Fig. 4 presents the average Gini index for the two crisis periods under investigation across municipalities, categorized into those without cooperative bank branches and those with varying levels of cooperative bank branches per capita (i.e. above and below the median value of the sample). In line with the conclusions made by Minetti et al. (2021), municipalities without cooperative bank branches show, on average, higher values of the Gini index. Conversely, municipalities with an above-median number of cooperative bank branches per capita tend to exhibit reduced income inequality. Moreover, the graph reveals that income inequality increased during both post-crisis periods. Notably, the graph underscores a potential correlation between the presence of cooperative bank branches and the trajectory of inequality in the aftermath of the crises. Precisely, municipalities with a more substantial per capita presence of cooperative bank branches exhibit a relatively smaller increase in income inequality during the post-crisis periods. In the subsequent section, we will delve into whether these descriptive evidence finds support through the empirical methodology outlined earlier.

4. Results

4.1. Local banks and income inequality after the crises

The baseline results on the distributional impact of cooperative banks in the aftermath of the financial and sovereign-debt crises are presented in Table 3. Panel A focuses on the financial crisis, while Panel B examines the sovereign-debt crisis. In columns (1)–(3) and (7)–(9), we employ the dummy variables *Coop bank branches (0/1)* and *Other bank branches (0/1)*; columns (4)–(6) and (10)–(12) display the results when we use the continuous proxies for the presence of cooperative and non cooperative banks, that are *Coop bank branches per capita* and *Other bank branches per capita*.

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[3] Fig. 3 illustrates the crises and post-crises periods in Italy in terms of GDP growth rate.

[4] To address endogeneity concerns, we also perform a robustness test using a two-stage least squares (2SLS) estimation technique in Section 4.2.1.
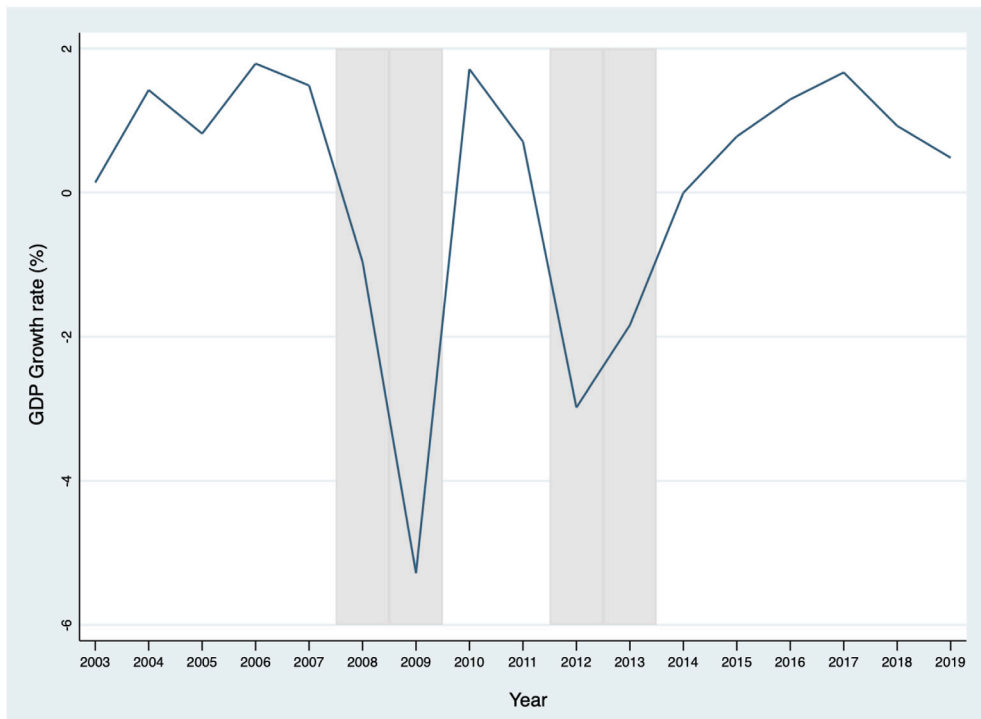
Fig. 3. Growth rate of GDP in Italy.
Notes: The figure reports the growth rate of GDP in Italy for the years 2003–2019. The darkest areas indicate the years of financial and sovereign-debt crises.
Source: World Bank.

Column (1) reveals a negative association between the presence of cooperative bank branches in a municipality and the Gini index after the financial crisis. The coefficient of the interaction term *Coop bank branches (0/1) × Post-crisis* is negative and statistically significant, indicating that municipalities with at least one cooperative bank branch experienced an approximately 3.1% reduction in the Gini index following the financial crisis compared to those without cooperative bank branches. This corresponds to around 8% of the average Gini index within the sample. Conversely, the same relationship is not observed when focusing on the presence of other (non-cooperative) banks (column 2). Here, the coefficient of the interaction term is negative, yet not statistically significant at conventional levels. These findings are confirmed when both cooperative and other banks are considered simultaneously in our regression (column 3). Once again, the presence of at least one cooperative bank branch in a municipality is negatively correlated with the Gini index after the financial crisis, while the impact of other banks remains statistically insignificant. The distributional effect of cooperative banks after the financial crisis is further confirmed when we employ the continuous variable *Coop bank branches per capita*, which is given by the number of cooperative bank branches per 1000 inhabitants (column 4). In this case, non-cooperative banks also seem to exert a significant, albeit smaller, effect in mitigating income inequality (column 5). Both interaction terms, *Coop bank branches per capita × Post-crisis* and *Other bank branches per capita × Post-crisis*, are negative and statistically significant.

Turning to the role played by cooperative banks after the sovereign-debt crisis, the estimation results align with those observed during the financial downturn. As displayed in column (7), the presence of cooperative bank branches in a municipality is negatively linked to the level of income inequality following the crisis. The coefficient of the interaction term is negative and statistically significant, indicating that Italian municipalities with cooperative bank branches experienced an 8.5% reduction in the Gini index compared to those lacking such branches. This corresponds to approximately 21% of the average Gini index within the sample. On the contrary, when considering other types of banks, the regression coefficients reveal a somewhat conflicting outcome. The coefficient of the interaction term is negative and statistically significant when examining other banks alone (column 8), but loses significance at conventional levels when included alongside the cooperative bank branches dummy (column 9). These results remain consistent when considering the number of cooperative and non-cooperative bank branches per 1000 inhabitants in the municipality (columns 10–12).[5]

In Table 4, we seek to understand whether the scale of the cooperative banking system at the municipal level influences income distribution. Examining various dimensions of the cooperative banking system may offer preliminary insights into the mechanisms driving the distributional impact of cooperative banks. While the presence of cooperative bank branches can gauge the availability

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[5] Most of these results are confirmed when we employ the alternative measures of the number of cooperative and non-cooperative bank branches per square kilometer (see Table A.1).
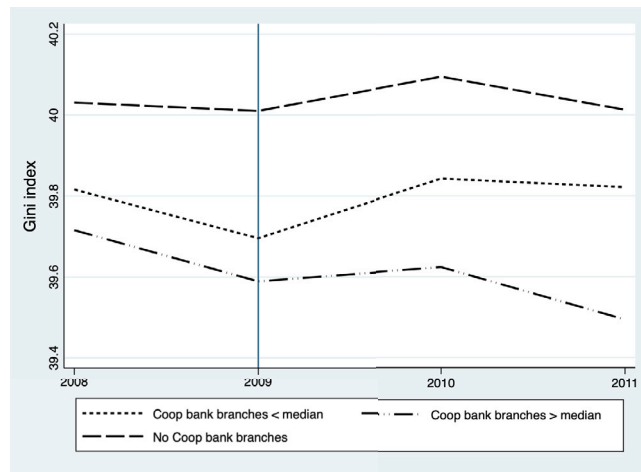
(a) Financial crisis
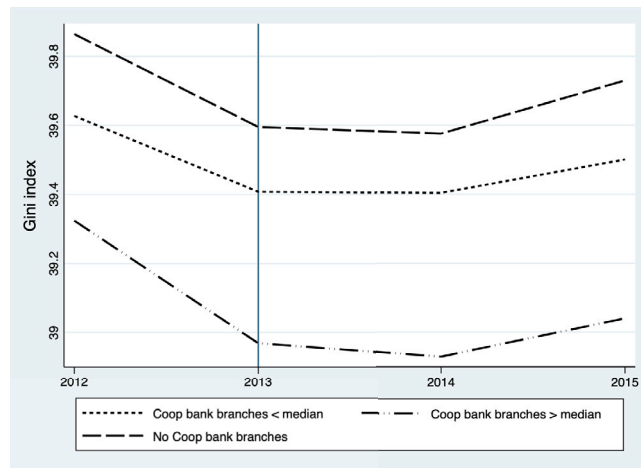
(b) Sovereign-debt crisis

Fig. 4. Income inequality across different levels of cooperative bank branches per capita.
Notes: The figure presents the average Gini index across municipalities, segmented into three categories: those lacking cooperative bank branches, those with a number of cooperative bank branches per capita above the median value of the sample, and those with a number of cooperative bank branches per capita below the median value. Panel (a) illustrates the years 2008–2011, encompassing the financial crisis and its aftermath. Panel (b) displays the years 2012–2015, covering the sovereign-debt crisis and its subsequent period.
Source: Our calculations based on data from Federcasse.

of financial services within a municipality, the extent of deposits and loans extended to households and businesses may serve as proxies for financial inclusion and credit availability.[6] Thus, in this table, we consider the following main independent variables: *Coop bank loans* and *Coop bank deposits*. Panel A presents the outcomes for the financial crisis, while Panel B concentrates on the sovereign-debt crisis. As depicted in columns (1)–(3), the volume of loans extended by cooperative banks in the municipality exhibits a negative association with the Gini index during the post-crisis period. The interaction term (*Coop bank loans × Post-crisis*) bears a negative and statistically significant correlation. Conversely, the magnitude of loans extended by other (non-cooperative) banks is not significantly linked to our measure of income inequality following the financial downturn. This result remains consistent when measuring the scope of the cooperative banking system through deposit amounts (columns 4–6). In this case as well, cooperative banks demonstrate a substantial capacity to diminish income inequality after the crisis. Regarding the sovereign-debt crisis, the findings presented in columns (7)–(12) indicate a negative relationship between the scale of the cooperative banking system and

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[6] Another factor that would be interesting to study is the role of interest rates applied by cooperative banks compared to other banks. Given the distinctive business models of cooperative institutions, there is a possibility of divergence in their interest rate policies. Unfortunately, our data does not allow us to study the effects of interest rates on income distribution. We will leave this question for future research

Table 3

Baseline results: cooperative bank branches and income inequality after crises.

Dep. variables	Panel A: Financial crisis						Panel B: Sovereign-debt crisis					
	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Coop bank branches (0/1)	−0.046		−0.046				0.111		0.110			
	(0.068)		(0.068)				(0.076)		(0.076)			
Coop bank branches (0/1) ×Post-crisis	−0.031*		−0.031*				−0.085***		−0.080***			
	(0.017)		(0.018)				(0.022)		(0.022)			
Other bank branches (0/1)		0.012	0.008					0.006	0.005			
		(0.090)	(0.090)					(0.053)	(0.053)			
Other bank branches (0/1) ×Post-crisis		−0.007	−0.001					−0.043*	−0.033			
		(0.017)	(0.018)					(0.022)	(0.022)			
Coop bank branches per capita				0.106		0.123				0.270*		0.303*
				(0.132)		(0.130)				(0.147)		(0.146)
Coop bank branches per capita ×Post-crisis				−0.136**		−0.156**				−0.136***		−0.166***
				(0.053)		(0.058)				(0.027)		(0.031)
Other bank branches per capita					0.107	0.112					0.095	0.102
					(0.093)	(0.093)					(0.061)	(0.062)
Other bank branches per capita ×Post-crisis					−0.114***	−0.123***					−0.191**	−0.203**
					(0.038)	(0.041)					(0.073)	(0.074)
Post-crisis	0.062***	0.057***	0.062***	0.067	0.098*	0.119*	0.008	0.015	0.027	−0.001	0.053	0.070
	(0.013)	(0.016)	(0.017)	(0.050)	(0.055)	(0.060)	(0.015)	(0.020)	(0.020)	(0.050)	(0.059)	(0.061)
Population (log)	−0.257	−0.305	−0.256	−0.267	−0.321	−0.265	0.129***	0.131***	0.128***	0.124**	0.095*	0.082
	(0.287)	(0.286)	(0.287)	(0.915)	(0.913)	(0.894)	(0.033)	(0.033)	(0.033)	(0.050)	(0.049)	(0.048)
Productive units (log)	0.089	0.086	0.089	0.092	0.083	0.089	−0.099***	−0.101***	−0.095***	−0.099***	−0.065**	−0.055**
	(0.076)	(0.076)	(0.076)	(0.069)	(0.070)	(0.068)	(0.028)	(0.028)	(0.028)	(0.030)	(0.026)	(0.025)
Bank branches per capita	−2.773	−2.778	−2.789	−2.525	−3.370***	−3.146***	−0.061	−0.020	−0.048	−0.036	−0.059	−0.061
	(4.455)	(4.452)	(4.459)	(1.481)	(0.969)	(0.983)	(0.341)	(0.342)	(0.342)	(0.192)	(0.184)	(0.178)
Share of population 0–24 y	−3.968***	−3.943***	−3.968***	−3.913	−3.680	−3.632	1.280***	1.324***	1.267***	1.365***	1.061**	1.068**
	(1.020)	(1.020)	(1.020)	(2.731)	(2.672)	(2.664)	(0.301)	(0.301)	(0.301)	(0.526)	(0.504)	(0.495)
Share of population 25–44 y	5.987***	6.062***	5.986***	5.982***	5.806***	5.674***	−1.152***	−1.259***	−1.129***	−1.227	−1.157	−1.062
	(0.839)	(0.839)	(0.840)	(1.932)	(1.852)	(1.798)	(0.299)	(0.298)	(0.299)	(0.845)	(0.790)	(0.748)
Share of population 45–64 y	2.282**	2.288**	2.280**	2.292	2.072	2.040	−1.795***	−1.724***	−1.769***	−1.798**	−1.753**	−1.805**
	(0.886)	(0.887)	(0.887)	(2.190)	(2.107)	(2.072)	(0.373)	(0.373)	(0.373)	(0.854)	(0.837)	(0.809)
Share of tax payers	−0.589**	−0.630**	−0.588**	−0.623	−0.618	−0.598	0.044*	0.047**	0.043*	0.049	0.043	0.042
	(0.251)	(0.250)	(0.251)	(0.476)	(0.469)	(0.459)	(0.023)	(0.023)	(0.023)	(0.042)	(0.041)	(0.041)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	31,197	31,197	31,197	31,197	31,197	31,197	24,848	24,848	24,848	24,848	24,848	24,848
R-squared	0.006	0.005	0.006	0.006	0.007	0.009	0.005	0.005	0.006	0.006	0.009	0.010

Notes: The table shows regression coefficients. The dependent variable is reported at the top of each column. In Panel A, we focus on the financial crisis. Here, the Post-crisis dummy is equal to one in the years 2010–2011, and zero in the years 2008–2009. In Panel B, we focus on the sovereign-debt crisis. Here, the Post-crisis dummy is equal to one in the years 2014–2015, and zero in the years 2012–2013. Three, two and one star (*) mean, respectively, a 99, 95 and 90 percent level of significance. Standard errors clustered at the municipal level are in parentheses. All of the variables are defined in Table 1.

the Gini index at the municipal level during the post-crisis period. This result holds regardless of the variable employed to quantify the size of cooperative banks, i.e. *Coop bank loans* and *Coop bank deposits*. Interestingly, the volume of loans and deposits by other banks also displays a negative correlation with the level of income inequality after the sovereign-debt crisis (columns 11–12).

Overall, these findings unveil a significant distributional influence of cooperative banks in the aftermath of the financial and sovereign-debt crises. Both the presence of cooperative bank branches and the extent of deposits and loans provided to households and businesses display a negative correlation with the Gini index during the post-crisis periods. By enhancing the accessibility of financial services and credit, and by improving the level of financial inclusion in the regions where they operate, cooperative banks can contribute to post-crisis recovery. Notably, this effect is not replicated by other financial institutions, suggesting that it is not merely the overall degree of banking development that impacts the mitigation of income inequality after a crisis, but rather the distinct character and orientation of cooperative banks.

4.2. Robustness tests

4.2.1. Addressing endogeneity issues

Endogeneity issues plague any analysis on the impact of banking development on income distribution. First, the relationship between cooperative banking and income inequality may be affected by reverse causality. Areas exhibiting low levels of income inequality might stimulate the demand for financial services, consequently fostering the emergence of cooperative banks aimed at

Table 4

Baseline results: cooperative bank loans and deposits and income inequality after crises.

Dep. variables	Panel A: Financial crisis						Panel B: Sovereign-debt crisis					
	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Coop bank loans per capita	0.001		0.002				−0.006		−0.006			
	(0.009)		(0.009)				(0.009)		(0.009)			
Coop bank loans per capita ×Post-crisis	−0.005**		−0.005**				−0.012***		−0.011***			
	(0.002)		(0.002)				(0.003)		(0.003)			
Other bank loans per capita		0.020*	0.019					0.006	0.006			
		(0.012)	(0.012)					(0.006)	(0.006)			
Other bank loans per capita ×Post-crisis		−0.003	−0.002					−0.009***	−0.008***			
		(0.002)	(0.002)					(0.003)	(0.003)			
Coop bank deposits per capita				−0.003		−0.003				−0.012		−0.012
				(0.009)		(0.009)				(0.009)		(0.009)
Coop bank deposits per capita ×Post-crisis				−0.005**		−0.005**				−0.011***		−0.010***
				(0.002)		(0.002)				(0.003)		(0.003)
Other bank deposits per capita					−0.006	−0.006					0.002	0.001
					(0.011)	(0.011)					(0.006)	(0.006)
Other bank deposits per capita ×Post-crisis					−0.002	−0.001					−0.008***	−0.007***
					(0.002)	(0.002)					(0.003)	(0.003)
Post-crisis	0.065***	0.066***	0.074***	0.065***	0.061***	0.070***	0.010	0.035*	0.049**	0.009	0.032	0.047**
	(0.013)	(0.016)	(0.017)	(0.013)	(0.016)	(0.017)	(0.015)	(0.019)	(0.020)	(0.015)	(0.019)	(0.020)
Population (log)	−0.238	−0.285	−0.225	−0.241	−0.289	−0.225	0.127***	0.128***	0.123***	0.128***	0.128***	0.124***
	(0.287)	(0.286)	(0.287)	(0.286)	(0.286)	(0.287)	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)
Productive units (log)	0.090	0.087	0.090	0.090	0.086	0.090	−0.096***	−0.094***	−0.088***	−0.098***	−0.095***	−0.089***
	(0.076)	(0.076)	(0.076)	(0.076)	(0.076)	(0.076)	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)
Bank branches per capita	−2.882	−3.074	−3.176	−2.804	−2.731	−2.760	−0.051	−0.026	−0.042	−0.047	−0.024	−0.036
	(4.451)	(4.452)	(4.454)	(4.451)	(4.451)	(4.454)	(0.341)	(0.341)	(0.341)	(0.341)	(0.341)	(0.341)
Share population 0–24 y	−3.957***	−3.918***	−3.933***	−3.977***	−3.953***	−3.990***	1.273***	1.271***	1.216***	1.285***	1.283***	1.232***
	(1.021)	(1.020)	(1.021)	(1.021)	(1.020)	(1.021)	(0.301)	(0.301)	(0.302)	(0.301)	(0.301)	(0.301)
Share population 25–44 y	5.951***	5.999***	5.907***	5.954***	6.028***	5.922***	−1.128***	−1.200***	−1.056***	−1.149***	−1.225***	−1.093***
	(0.840)	(0.840)	(0.841)	(0.840)	(0.840)	(0.841)	(0.299)	(0.298)	(0.300)	(0.299)	(0.298)	(0.299)
Share population 45–64 y	2.281**	2.259**	2.259**	2.287***	2.255**	2.255**	−1.814***	−1.712***	−1.772***	−1.809***	−1.710***	−1.767***
	(0.886)	(0.887)	(0.887)	(0.886)	(0.887)	(0.887)	(0.373)	(0.373)	(0.373)	(0.373)	(0.373)	(0.373)
Share of tax payers	−0.566**	−0.606**	−0.549**	−0.571**	−0.617**	−0.559**	0.043*	0.044*	0.040*	0.044*	0.045*	0.041*
	(0.251)	(0.250)	(0.252)	(0.250)	(0.250)	(0.251)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	31,197	31,197	31,197	31,197	31,197	31,197	24,848	24,848	24,848	24,848	24,848	24,848
R-squared	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.006	0.006	0.005	0.006

Notes: The table shows regression coefficients. The dependent variable is reported at the top of each column. In Panel A, we focus on the financial crisis. Here, the Post-crisis dummy is equal to one in the years 2010–2011, and zero in the years 2008–2009. In Panel B, we focus on the sovereign-debt crisis. Here, the Post-crisis dummy is equal to one in the years 2014–2015, and zero in the years 2012–2013. Three, two and one star (*) mean, respectively, a 99, 95 and 90 percent level of significance. Standard errors clustered at the municipal level are in parentheses. All of the variables are defined in Table 1.

bolstering local entrepreneurial initiatives. As detailed below, this issue is partially mitigated by the historical factors that primarily influence the distribution of various types of banks across the Italian territory, stemming from the banking regulation of 1936 (Guiso et al., 2004). Second, unobserved factors may jointly shape both the local banking structure and income distribution. This omitted variables issue is attenuated by the panel dimension of our dataset and the adoption of a municipality fixed effects model when estimating Eq. (1). As the majority of concerns related to omitted variables are likely rooted in the historical context of the regions, employing municipality fixed effects effectively control for them. In addition, Italian policies are predominantly centralized under the national government, with very limited influence from municipal administrations in implementing measures that impact income inequality. Nevertheless, in this section, we try to further alleviate concerns regarding reverse causality by employing a two-stage least squares (2SLS) estimation technique.

To implement the 2SLS approach, we need a suitable set of instruments. Specifically, in order to be valid, our instruments must be correlated with the presence of cooperative banks in the municipality without directly influencing the local level of income inequality. In line with Guiso et al. (2004), Benfratello et al. (2008), and D'Onofrio et al. (2019), we leverage the 1936 Italian banking law as a basis for our analysis. More specifically, we select two different indicators as our instrumental variables (all measured in 1936): *Number of branches in 1936*, that is the number of bank branches in the province per 100,000 inhabitants; and *Popular banks in 1936*, that is the number of popular bank branches in the province per 100,000 inhabitants.

The 1936 banking regulation was aimed at enhancing bank stability through restrictions on bank competition. This legal framework imposed strict constraints on the ability of different types of banks to open new branches. More specifically, each credit

Table 5

Robustness tests: addressing endogeneity issues.

Dep. variables	Panel A: Financial crisis						Panel B: Sovereign-debt crisis					
	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Coop bank branches (0/1)	0.394***	−0.096					0.399***	0.079				
	(0.082)	(0.129)					(0.088)	(0.128)				
Coop bank branches (0/1) ×Post-crisis	−0.780***	−0.356***					−0.761***	−0.151				
	(0.074)	(0.113)					(0.100)	(0.186)				
Other bank branches (0/1)		−1.068***	−0.746***					−1.107***	−0.958***			
		(0.160)	(0.180)					(0.161)	(0.239)			
Other bank branches (0/1) ×Post-crisis		2.055***	1.452***					2.101***	1.822***			
		(0.217)	(0.273)					(0.284)	(0.437)			
Coop bank branches per capita				0.665***		0.485***				0.452***		0.464***
				(0.126)		(0.177)				(0.127)		(0.127)
Coop bank branches per capita ×Post-crisis				−0.989***		−0.685***				−0.920***		−0.839***
				(0.081)		(0.221)				(0.101)		(0.168)
Other bank branches per capita					0.541***	0.252**					0.712***	0.119
					(0.106)	(0.126)					(0.112)	(0.155)
Other bank branches per capita ×Post-crisis					−2.293***	−0.785					−1.872***	−0.242
					(0.244)	(0.525)					(0.275)	(0.404)
Post-crisis	0.292***	−1.302***	−0.793***	0.160***	0.979***	0.445**	0.165***	−1.326***	−1.117***	0.061***	0.614***	0.137
	(0.026)	(0.144)	(0.206)	(0.015)	(0.100)	(0.190)	(0.027)	(0.179)	(0.309)	(0.016)	(0.093)	(0.126)
+ controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	31,197	31,197	31,197	31,197	31,197	31,197	24,848	24,848	24,848	24,848	24,848	24,848
F-instruments	749.5	121.6	50.72	1746	100	12.45	443.9	81.91	26.12	1261	75.75	26.39

Notes: The table shows regression coefficients of the second stage of the 2SLS estimation. The dependent variable is reported at the top of each column. In Panel A, we focus on the financial crisis. Here, the Post-crisis dummy is equal to one in the years 2010–2011, and zero in the years 2008–2009. In Panel B, we focus on the sovereign-debt crisis. Here, the Post-crisis dummy is equal to one in the years 2014–2015, and zero in the years 2012–2013. Three, two and one star (*) mean, respectively, a 99, 95 and 90 percent level of significance. Standard errors clustered at the municipal level are in parentheses. All of the variables are defined in Table 1.

institution was assigned a geographical area of competence based on its 1936 presence, and its ability to lend was restricted to that area. The full liberalization of bank entry into local credit markets only occurred toward the late 1990s; however, the effects of the 1936 banking regulation persisted within the local banking structure for subsequent decades. Thus, we expect a correlation between the current local banking structure and the regulatory tightness of the 1936. As discussed by Guiso et al. (2004), the distribution of different bank types across provinces in 1936 was not driven by market forces but rather emerged from a "historical accident", and in particular from the interplay between prior waves of bank creation and the history of Italian unification (Minetti et al., 2021). Furthermore, the design of the banking law did not consider the needs of individual provinces. Indeed, disparities in restrictions among different bank types were linked to their connections with the Fascist regime. Consequently, it is unlikely that the 1936 banking law exerts any direct influence on contemporary income inequality.

Table 5 presents the results of the second stage of the 2SLS estimation.[7] Panel A focuses on the financial crisis, while Panel B examines the sovereign-debt crisis. Regression coefficients confirm our baseline findings. The presence of cooperative banks exhibits a negative and statistically significant association with the Gini index following both the financial and sovereign-debt crises. Conversely, no such relationship is observed when focusing the attention to the presence of other (non-cooperative) banks.[8]

4.2.2. Other measurements

In Table 6, we estimate the distributional impact of cooperative banks after the two crises on a set of alternative dependent variables. These include: the ratio between the incomes of those at the 90th percentile and those at the 10th percentile (columns 1–4), the logarithm of incomes of those at the 10th percentile (columns 5–8), and the logarithm of incomes of those at the 25th percentiles (columns 9–12). Panel A presents the results when measuring the presence of cooperative and other banks in the municipality using the binary variables *Coop bank branches (0/1)* and *Other bank branches (0/1)*. Panel B displays the marginal effects estimated when employing the continuous measures *Coop bank branches per capita* and *Other bank branches per capita*. The results in columns (1)–(4) of Panel A reveal that the existence of at least one cooperative bank branch in the municipality is negatively and significantly associated with the ratio between the 90th and 10th percentiles of income after both crises. This relationship also holds for the

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[7] The first stage estimation results are displayed in Table A.2. Both instrumental variables appear to be statistically significant. Moreover, given the high values of the F-statistics, reported at the bottom of the table, it seems that we do not face an issue of weak instruments.

[8] As a further robustness test, we experiment by considering lagged values of cooperative and non-cooperative banks presence and number of branches. The estimation results confirm our baseline findings and are displayed in Table A.3.

Table 6
Robustness tests: other measurements.

Dep. Variables	Panel A: Cooperative and other bank branches (0/1)											
	Ratio of the 90th and 10th percentiles of income				Income at the 10th percentile (Log)				Income at the 25th percentile (Log)			
	Financial crisis		Sovereign-debt crisis		Financial crisis		Sovereign-debt crisis		Financial crisis		Sovereign-debt crisis	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Coop bank branches (0/1)	−0.064	−0.064	−0.045	−0.044	−0.003	−0.003	0.001	0.001	0.004	0.004	−0.052***	−0.052***
	(0.045)	(0.045)	(0.051)	(0.051)	(0.002)	(0.002)	(0.003)	(0.003)	(0.012)	(0.012)	(0.017)	(0.017)
Coop bank branches (0/1) ×Post-crisis	−0.051***	−0.047***	−0.041***	−0.033**	−0.003	−0.001	−0.000	−0.000	0.002	0.002	0.030***	0.029***
	(0.012)	(0.012)	(0.015)	(0.015)	(0.002)	(0.002)	(0.003)	(0.002)	(0.003)	(0.003)	(0.005)	(0.005)
Other bank branches (0/1)		−0.052		0.077**		0.005**		0.002		0.009		−0.010
		(0.060)		(0.035)		(0.002)		(0.002)		(0.015)		(0.012)
Other bank branches (0/1) ×Post-crisis		−0.022*		−0.062***		−0.006*		−0.002		0.002		0.014***
		(0.012)		(0.015)		(0.003)		(0.002)		(0.003)		(0.005)
Post-crisis	0.190***	0.202***	0.363***	0.401***	−0.009***	−0.005	−0.023***	−0.021***	−0.001	−0.002	0.007**	−0.002
	(0.009)	(0.011)	(0.010)	(0.013)	(0.003)	(0.005)	(0.004)	(0.004)	(0.002)	(0.003)	(0.003)	(0.004)
+ controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	31,197	31,197	24,848	24,848	31,197	31,197	24,848	24,848	31,197	31,197	24,848	24,848
R-squared	0.091	0.091	0.135	0.136	0.127	0.130	0.203	0.204	0.003	0.003	0.026	0.027
	Panel B: Cooperative and other bank branches per capita											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Coop bank branches per capita	−0.037	−0.035	−0.010	−0.001	−0.009**	−0.008**	0.007	0.008	0.013	0.013	−0.059***	−0.065**
	(0.076)	(0.076)	(0.083)	(0.083)	(0.004)	(0.004)	(0.005)	(0.005)	(0.019)	(0.019)	(0.027)	(0.027)
Coop bank branches per capita ×Post-crisis	−0.000	−0.038	−0.039	−0.048	−0.001	−0.010***	0.002	0.009*	−0.002	0.011	0.036***	−0.024
	(0.019)	(0.075)	(0.024)	(0.084)	(0.001)	(0.004)	(0.001)	(0.005)	(0.005)	(0.019)	(0.008)	(0.027)
Other bank branches per capita		−0.002		0.038		0.009***		0.003		0.013		−0.027***
		(0.049)		(0.030)		(0.003)		(0.002)		(0.012)		(0.010)
Other bank branches per capita ×Post-crisis		−0.019		−0.056***		−0.006***		−0.001		−0.002		0.033***
		(0.012)		(0.016)		(0.001)		(0.001)		(0.003)		(0.005)
Post-crisis	0.173***	0.181***	0.357***	0.377***	−0.009***	−0.007***	−0.023***	−0.023***	−0.000	0.001	0.011***	−0.001
	(0.008)	(0.010)	(0.010)	(0.011)	(0.000)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)	(0.004)
+ controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	31,197	31,197	24,848	24,848	31,197	31,197	24,848	24,848	31,197	31,197	24,848	24,848
R-squared	0.090	0.090	0.135	0.136	0.126	0.130	0.204	0.204	0.003	0.003	0.025	0.028

Notes: The table shows regression coefficients. The dependent variable is reported at the top of each column. In columns (1)–(2), (5)–(6), and (9)–(10), we focus on the financial crisis. Here, the Post-crisis dummy is equal to one in the years 2010–2011, and zero in the years 2008–2009. In columns (3)–(4), (7)–(8), and (11)–(12), we focus on the sovereign-debt crisis. Here, the Post-crisis dummy is equal to one in the years 2014–2015, and zero in the years 2012–2013. Three, two and one star (*) mean, respectively, a 99, 95 and 90 percent level of significance. Standard errors clustered at the municipal level are in parentheses. All of the variables are defined in Table 1.

presence of non-cooperative bank branches. Conversely, the marginal effects of the interaction terms with the post-crisis dummy are no longer statistically significant when considering the number of cooperative and other bank branches per 1000 inhabitants (columns 1–4 of Panel B). Concerning the impact on the logarithm of income for individuals at the 10th and 25th percentiles of the distribution, the estimation results indicate that the presence of cooperative banks has a positive association with both measures after the sovereign-debt crisis (columns 5–12 of Panels A and B). In contrast, there is no apparent beneficial effect on the level of poverty after the financial crisis. Turning the attention to other banks, the marginal effects suggest that the presence of non-cooperative bank branches is inversely related to the income of individuals at the 10th percentile of the distribution following the financial crisis.

In summary, the findings in Table 6 suggest that, while non-cooperative banks are positively associated with our measures of poverty, the mitigation of income inequality produced by cooperative banks in the aftermath of the crises (especially the sovereign-debt one) was driven by a slight improvement in the income level of the poor.

5. Heterogeneities

In this section, our objective is to delve deeper into the distributional impact of cooperative banks in a post-crisis scenario. Guided by the insights provided by prior research and reinforced by anecdotal evidence on the initiatives undertaken by cooperative banks in Italy, we focus on four main factors that could potentially shape the interplay between local banks and income inequality. These

factors include: the degree of urbanization within the municipality (Section 5.1); the industrial structure, as indicated by the number of active productive units situated in the municipality (Section 5.2); the level of financial development measured by the amount of deposits and loans extended to households and businesses at the municipal level (Section 5.3); the efficiency of the judicial system within the municipality (Section 5.4).

5.1. Urbanization

Cooperative banks play a pivotal role in mitigating the depopulation within local communities and in supporting financial inclusion in smaller municipalities. In the northern regions of Italy, Banca della Marca has actively nurtured the growth of local communities and endeavored to counteract the decline in smaller municipalities through the "Social Start" program. In the southern regions of the country, since 2003, several cooperative banks have promoted the initiative "Laboratorio Sud", aimed at enhancing job creation and reducing migration from the more remote southern areas. Within the realm of the economic literature, there is a recurrent theme positing that the level of urbanization significantly influences income inequality. Specifically, the works of Baum-Snow and Pavan (2013) and Behrens and Robert-Nicoud (2014) suggest that a reduced concentration in big cities can mitigate income inequality. By generating productivity improvements through agglomeration economies, large urban centers foster segmentation and the selection of highly productive entrepreneurs, which can, in turn, have adverse repercussions on the income of less efficient business owners.

Based on these arguments, in Table 7 we estimate the distributional impact of cooperative banks following the financial and sovereign-debt crises by distinguishing small (less than 5000 inhabitants) medium (more than 5000 and less than 15,000 inhabitants), and large (more than 15,000 inhabitants) municipalities. Panel A displays the results for the financial crisis, while Panel B focuses on the sovereign-debt crisis.[9] The estimations underscore that the presence of at least one cooperative bank branch bears a negative and statistically significant association with the Gini index following both the financial and sovereign-debt crises, particularly evident in small municipalities (Panels A and B, column 1). In this case, the existence of at least one cooperative bank branch corresponds to a reduction of approximately 4.7% and 12.8% in the Gini index after the financial and sovereign-debt crises, respectively. This result persists when the number of cooperative bank branches per capita is included in the regression (Panels A and B, column 2).

5.2. Industry structure

As highlighted by the literature, the local industrial composition emerges as a significant channel through which financial development can affect income inequality (Banerjee and Newman, 1993; Beck et al., 2010). Specifically, the creation of new businesses and the survival of incumbent firms are apt to yield positive distributional effects through the creation of job opportunities. Anecdotal evidence underlines the proactive role played by Italian cooperative banks in advancing new entrepreneurial ventures, particularly those led by young and female entrepreneurs. For example, since 2006, the cooperative bank of Rome has promoted the microcredit activity "Fondo Futuro" with the objective of fostering entrepreneurial initiatives. Furthermore, anecdotal evidence also alludes to the supportive role of cooperative banks in nurturing the expansion of established businesses. For instance, the cooperative bank of San Marco dei Cavoti e del Sannio extended financial resources to assist small and medium-sized enterprises in temporary difficulty (Minetti et al., 2021).

In order to test the relevance of this channel, in Table 8, we investigate the distributional impact of cooperative banks by classifying Italian municipalities on the basis of the number of productive units located in the territory. In columns (1)–(2) and (5)–(6), we run our baseline regressions on the subsample of municipalities with a number of productive units lower than the sample mean; in columns (3)–(4) and (7)–(8), we instead focus on those municipalities with a number of firms higher than the average value of the sample.[10] Estimation results indicate that the presence of at least one cooperative bank branch bears a negative correlation with the Gini index in municipalities with high levels of industrial development, and only following the sovereign-debt crisis (column 7). Conversely, the number of cooperative bank branches per 1000 inhabitants significantly mitigates income inequality in the post-crisis period, for both financial and sovereign-debt crises, and almost independently on the degree of industrial development.

5.3. Financial development

Recent studies have uncovered the significant role that lending volumes and deposits can play for the evolution of income distribution. Delis et al. (2019) reveal that banks' lending decisions can potentially propel a polarization of borrowers' income, thereby amplifying income inequality. Specifically, while individuals subject to credit rationing encounter a progressive erosion in their income, those who receive loans witness an upward trajectory in their earnings. In addition, Beck et al. (2007) posit that financial inclusion and financial access play pivotal roles in gauging income inequality. In regions where financial services are readily accessible, the advancement of financial development corresponds to a reduction in income inequality.

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[9] For reasons of space, in Table 7 we report the results for cooperative banks only. The estimates when considering non-cooperative banks are presented in Panel A of Table A.4

[10] For reasons of space, in Table 8 we report the results for cooperative banks only. The estimates when considering non-cooperative banks are presented in Panel B of Table A.4

Table 7
Heterogeneities: Urbanization.

Dep. Variables	Panel A: Financial crisis					
	Small municipalities (<5,000 inhabitants)		Medium municipalities (>5,000 <15,000 inhabitants)		Large municipalities (>15,000 inhabitants)	
	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index
	(1)	(2)	(3)	(4)	(5)	(6)
Coop bank branches (0/1)	−0.098		−0.063		0.186	
	(0.098)		(0.095)		(0.164)	
Coop bank branches (0/1) ×Post-crisis	−0.047**		0.020		−0.079*	
	(0.023)		(0.029)		(0.047)	
Coop bank branches per capita		0.134		−0.257		0.409
		(0.132)		(0.272)		(0.467)
Coop bank branches per capita ×Post-crisis		−0.139***		−0.053		−0.107
		(0.034)		(0.072)		(0.090)
Post-crisis	0.047***	0.049***	0.084***	0.098***	0.170***	0.148***
	(0.016)	(0.015)	(0.029)	(0.027)	(0.049)	(0.045)
+ controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	21,632	21,632	6,631	6,631	2,934	2,934
R-squared	0.005	0.007	0.019	0.019	0.031	0.030

Dep. Variables	Panel B: Sovereign-debt crisis					
	Small municipalities (<5,000 inhabitants)		Medium municipalities (>5,000 <15,000 inhabitants)		Large municipalities (>15,000 inhabitants)	
	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index
	(1)	(2)	(3)	(4)	(5)	(6)
Coop bank branches (0/1)	0.069		0.072		0.108	
	(0.130)		(0.129)		(0.205)	
Coop bank branches (0/1) ×Post-crisis	−0.128***		−0.059		−0.058	
	(0.037)	(0.037)	(0.055)	(0.055)	(0.067)	(0.067)
Coop bank branches per capita		0.214		0.878**		1.051
		(0.150)		(0.446)		(0.1.209)
Coop bank branches per capita ×Post-crisis		−0.115***		−0.390		0.021
		(0.044)		(0.309)		(0.558)
Post-crisis	−0.007	−0.015	0.057	0.057*	0.106**	0.074*
	(0.019)	(0.019)	(0.036)	(0.034)	(0.051)	(0.040)
+ controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	17,314	17,314	5,204	5,204	2,330	2,330
R-squared	0.005	0.004	0.012	0.013	0.020	0.020

Notes: The table shows regression coefficients. The dependent variable is reported at the top of each column. In Panel A, we focus on the financial crisis. Here, the Post-crisis dummy is equal to one in the years 2010–2011, and zero in the years 2008–2009. In Panel B, we focus on the sovereign-debt crisis. Here, the Post-crisis dummy is equal to one in the years 2014–2015, and zero in the years 2012–2013. Small municipalities are defined as municipalities with less than 5000 inhabitants; medium municipalities are defined as municipalities with more than 5000 inhabitants and less than 15,000 inhabitants; large municipalities are defined as municipalities with more than 15,000 inhabitants. Three, two and one star (*) mean, respectively, a 99, 95 and 90 percent level of significance. Standard errors clustered at the municipal level are in parentheses. All of the variables are defined in Table 1.

Drawing on these arguments, in Table 9 we classify Italian municipalities on the basis of the amount (per 1000 inhabitants) of bank deposits (Panel A) and loans (Panel B) extended to households and firms.[11] Specifically, in columns (1)–(2) and (5)–(6), we run our baseline regression on the subsamples of municipalities characterized by an amount of deposits and loans per capita that fall below the median threshold of the sample distribution. In columns (3)–(4) and (7)–(8), we instead focus on those municipalities

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[11] To account for a potential complementarity between cooperative and non-cooperative banking development in reducing income inequality, we also conducted a similar analysis using two additional measures of financial development: the development of the cooperative banking sector and the development of the non-cooperative banking sector. The results, available upon request, do not indicate a clear complementarity between cooperative and non-cooperative banks in mitigating inequality after the two crises.

Table 8

Heterogeneities: Industry structure.

Dep. Variables	Panel A: Financial crisis				Panel B: Sovereign-debt crisis			
	Number of productive units < mean		Number of productive units > mean		Number of productive units < mean		Number of productive units > mean	
	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Coop bank branches (0/1)	0.044		−0.192**		0.010		0.158	
	(0.097)		(0.096)		(0.120)		(0.118)	
Coop bank branches (0/1) ×Post-crisis	−0.028		−0.021		0.024		−0.101***	
	(0.025)		(0.025)		(0.037)		(0.038)	
Coop bank branches per capita		0.519***		−0.282		0.219		0.284
		(0.168)		(0.187)		(0.177)		(0.182)
Coop bank branches per capita ×Post-crisis		−0.100**		−0.149***		−0.036		−0.132**
		(0.044)		(0.039)		(0.061)		(0.061)
Post-crisis	0.087***	0.092***	0.041*	0.044**	0.063***	0.084***	−0.159***	−0.102**
	(0.017)	(0.017)	(0.021)	(0.019)	(0.018)	(0.017)	(0.033)	(0.028)
+ controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	17,378	15,651	13,819	15,546	14,108	12,776	10,740	12,072
R-squared	0.013	0.015	0.007	0.007	0.008	0.008	0.015	0.018

Notes: The table shows regression coefficients. The dependent variable is reported at the top of each column. In Panel A, we focus on the financial crisis. Here, the Post-crisis dummy is equal to one in the years 2010–2011, and zero in the years 2008–2009. In Panel B, we focus on the sovereign-debt crisis. Here, the Post-crisis dummy is equal to one in the years 2014–2015, and zero in the years 2012–2013. In columns (1)–(2) and (5)–(6), the regressions are run on the subsample of municipalities with a number of productive units lower than the median value of the sample; in columns (3)–(4) and (7)–(8), the regressions are run on the subsample of municipalities with a number of productive units higher than the median value of the sample. Three, two and one star (*) mean, respectively, a 99, 95 and 90 percent level of significance. Standard errors clustered at the municipal level are in parentheses. All of the variables are defined in Table 1.

with an amount of deposits and loans per capita higher than the sample median.[12] As discussed in the previous sections, the amount of bank deposits collected from savers can be interpreted as a measure of financial inclusion, while the amount of loans extended to firms and households can be considered a measure of credit availability at the municipal level.

Estimation results indicate that the presence of cooperative banks exhibits a negative correlation with the Gini index in the aftermath of the two crises within municipalities characterized by a high amount of bank deposits per capita (Panel A). Specifically, the existence of at least one cooperative bank branch is associated with a reduction of the Gini index of approximately 3.1% (column 3) and 5.8% (column 7) after the financial and sovereign-debt crises, respectively. The interaction between the variable *Coop bank branches (0/1)* and the post-crisis dummy is instead non-statistically significant when Italian municipalities are classified based on the amount of loans per capita (Panel B). However, in this case, it is the number of cooperative bank branches per 1000 inhabitants that significantly mitigates income inequality after the two crises within municipalities with a high volume of loans (columns 4 and 8).

5.4. Judicial efficiency

The quality of a country's institutions, including its legal, political, and regulatory frameworks, has been found to exert a profound influence on the distribution of income within its society (De Haan and Sturm, 2017; Bahamonde and Trasberg, 2021). The underlying premise is that well-functioning institutions provide an enabling environment that promotes equitable economic opportunities, while weak institutional frameworks exacerbate disparities in both income and wealth. Most importantly from our perspective, institutional quality may also condition the interplay between finance and income inequality (Mc Namara et al., 2020). Some empirical studies have shown that weak property rights discourage entrepreneurs from reinvesting their profits, even when they own the collateral required to obtain external finance (Haber, 1991; Johnson et al., 2002). Moreover, in weak institutional environments, established interests may gain privileged credit access, potentially resulting in a detrimental impact of financial development on growth and poverty (Rajan and Zingales, 2003). This effect is exacerbated in the presence of corrupt financial systems, where credit can be diverted toward unproductive or wasteful projects. In such cases, the potential contribution of banks to income inequality might be entirely nullified (Tran et al., 2020; Lee et al., 2022).

Based on these arguments, in this section, we try to estimate whether weak institutions and property rights influence the impact of cooperative banks on income inequality in the aftermath of the financial and sovereign-debt crises. Given our focus on municipalities within a single country, obtaining comprehensive municipal-level measures of property rights poses a significant challenge. In light

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[12] Again, due to spatial constraints, in Table 9 we report the results for cooperative banks only. The estimates when considering non-cooperative banks are presented in Table A.5.

Table 9

Heterogeneities: Financial development.

Dep. Variables	Panel A: Bank deposits per capita							
	Financial crisis				Sovereign-debt crisis			
	Deposits < median		Deposits > median		Deposits < median		Deposits > median	
	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Coop bank branches (0/1)	0.045		−0.144**		0.111		0.075	
	(0.145)		(0.065)		(0.151)		(0.092)	
Coop bank branches (0/1) ×Post-crisis	0.011		−0.031*		0.091		−0.058**	
	(0.038)		(0.018)		(0.071)		(0.026)	
Coop bank branches per capita		0.107		−0.937***		0.208		0.500***
		(0.158)		(0.255)		(0.203)		(0.191)
Coop bank branches per capita ×Post-crisis		0.028		−0.189***		0.052		−0.156
		(0.051)		(0.030)		(0.176)		(0.042)
Post-crisis	0.043**	0.047**	0.061***	0.075***	0.024	0.030	−0.048**	−0.047**
	(0.021)	(0.023)	(0.016)	(0.039)	(0.022)	(0.027)	(0.023)	(0.051)
+ controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	16,328	16,328	14,869	14,869	12,571	12,571	12,277	12,277
R-squared	0.009	0.009	0.005	0.009	0.005	0.005	0.012	0.014
Dep. Variables	Panel B: Bank loans per capita							
	Financial crisis				Sovereign-debt crisis			
	Loans < median		Loans > median		Loans < median		Loans > median	
	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Coop bank branches (0/1)	0.163		−0.157**		0.117		0.019	
	(0.156)		(0.064)		(0.161)		(0.087)	
Coop bank branches (0/1) ×Post-crisis	0.008		−0.017		0.094		−0.025	
	(0.042)		(0.018)		(0.066)		(0.025)	
Coop bank branches per capita		0.142		−0.980***		0.124		0.428
		(0.157)		(0.252)		(0.193)		(0.184)
Coop bank branches per capita ×Post-crisis		−0.020		−0.188***		0.023		−0.120***
		(0.053)		(0.031)		(0.102)		(0.043)
Post-crisis	0.031	0.033*	0.060***	0.082***	0.026	0.033	−0.091***	−0.082***
	(0.021)	(0.020)	(0.016)	(0.014)	(0.021)	(0.021)	(0.024)	(0.022)
+ controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	15,834	15,834	15,363	15,363	12,589	12,589	12,259	12,259
R-squared	0.010	0.010	0.007	0.011	0.006	0.006	0.013	0.015

Notes: The table shows regression coefficients. The dependent variable is reported at the top of each column. In columns (1)–(4), we focus on the financial crisis. Here, the Post-crisis dummy is equal to one in the years 2010–2011, and zero in the years 2008–2009. In columns (5)–(8), we focus on the sovereign-debt crisis. Here, the Post-crisis dummy is equal to one in the years 2014–2015, and zero in the years 2012–2013. In Panel A, financial development is measured through the amount of bank deposits at the municipal level (per 1000 inhabitants). In columns (1)–(2) and (5)–(6), the regressions are run on the subsample of municipalities with an amount of deposits (per 1000 inhabitants) lower than the median value of the sample; in columns (3)–(4) and (7)–(8), the regressions are run on the subsample of municipalities with an amount of deposits (per 1000 inhabitants) higher than the median value of the sample. In Panel B, financial development is measured through the amount of bank loans at the municipal level (per 1000 inhabitants). In columns (1)–(2) and (5)–(6), the regressions are run on the subsample of municipalities with an amount of loans (per 1000 inhabitants) lower than the median value of the sample; in columns (3)–(4) and (7)–(8), the regressions are run on the subsample of municipalities with an amount of loans (per 1000 inhabitants) higher than the median value of the sample. Three, two and one star (*) mean, respectively, a 99, 95 and 90 percent level of significance. Standard errors clustered at the municipal level are in parentheses. All of the variables are defined in Table 1.

of these limitations, we employ a measure of judicial efficiency as a proxy for institutional quality and property rights. This choice is grounded in the rationale that an effective judicial system is indicative of strong property rights protection and the overall quality of institutions. Moreover, even countries with similar legal rules may enforce them to a different extent depending on the efficiency of their judiciary (Jappelli et al., 2005).

Hence, in Table 10, we classify Italian municipalities on the basis of the number of pending processes per judge. In columns (1)–(2) and (5)–(6), we run our baseline regressions on the subsample of municipalities with a number of pending processes per judge lower than the sample median; in columns (3)–(4) and (7)–(8), we instead focus on those municipalities with a number of

Table 10

Heterogeneities: Judicial efficiency.

Dep. Variables	Panel A: Financial crisis				Panel B: Sovereign-debt crisis			
	Pending processes < median		Pending processes > median		Pending processes < median		Pending processes > median	
	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Coop bank branches (0/1)	−0.263*		0.048		0.004		0.146**	
	(0.145)		(0.064)		(0.191)		(0.070)	
Coop bank branches (0/1) ×Post-crisis	−0.035		−0.037**		−0.138***		−0.056**	
	(0.032)		(0.018)		(0.040)		(0.024)	
Coop bank branches per capita		0.016		0.210		0.223		0.339**
		(0.187)		(0.129)		(0.192)		(0.154)
Coop bank branches per capita ×Post-crisis		−0.104***		−0.184***		−0.102**		−0.155**
		(0.040)		(0.046)		(0.049)		(0.061)
Post-crisis	0.014	0.018	0.081***	0.084***	−0.108***	−0.122***	0.069***	0.065***
	(0.023)	(0.022)	(0.015)	(0.014)	(0.028)	(0.028)	(0.016)	(0.015)
+ controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14,337	14,337	16,860	16,860	11,234	11,234	13,614	13,614
R-squared	0.004	0.004	0.021	0.022	0.008	0.007	0.013	0.013

Notes: The table shows regression coefficients. The dependent variable is reported at the top of each column. In Panel A, we focus on the financial crisis. Here, the Post-crisis dummy is equal to one in the years 2010–2011, and zero in the years 2008–2009. In Panel B, we focus on the sovereign-debt crisis. Here, the Post-crisis dummy is equal to one in the years 2014–2015, and zero in the years 2012–2013. In columns (1)–(2) and (5)–(6), the regressions are run on the subsample of municipalities with a number of pending processes per judge lower than the median value of the sample; in columns (3)–(4) and (7)–(8), the regressions are run on the subsample of municipalities with a number of pending processes per judge higher than the median value of the sample. Three, two and one star (*) mean, respectively, a 99, 95 and 90 percent level of significance. Standard errors clustered at the municipal level are in parentheses. All of the variables are defined in Table 1.

pending processes per judge higher than the average value of the sample.[13] Estimation results indicate that the presence of at least one cooperative bank branch and the number of cooperative bank branches per 1000 inhabitants bear a negative correlation with the Gini index following both the financial and sovereign-debt crises, independently on the degree of judicial efficiency.

6. Conclusions

In this paper we investigated whether local cooperative banks contributed to the mitigation of income inequality in Italian municipalities following the two major crises that defined the European landscape from 2008 to 2015 — specifically, the financial and sovereign-debt crises. The estimation results indicated that, despite the rise in income inequality following the occurrence of both crises, municipalities characterized by the presence of cooperative banks exhibited a comparatively smaller increase. To be more precise, in municipalities with at least one cooperative bank branch, the Gini index after the financial and sovereign-debt crises experienced a reduction of 3.1% and 8.5%, respectively, compared to municipalities without any branches of cooperative banks. These findings remained consistent when shifting our focus from the mere presence of cooperative banks to assessing the number of cooperative bank branches per capita. In contrast, the distributional impact of banks turned out to be statistically non-significant when considering other types of financial institutions, specifically non-cooperative banks. This suggests that the mitigation of income inequality after the two crises was not solely determined by the level of banking development, but rather by the specific nature and orientation of cooperative banks.

The analysis then explored the mechanisms through which cooperative banks can influence income distribution following a crisis period. Specifically, guided by insights from prior literature and supported by anecdotal evidence regarding the initiatives fostered by cooperative banks, we concentrated on the municipal level of urbanization, industry structure (measured by the number of local productive units), financial development (proxied by the extent of deposits and loans extended to both businesses and households), and judicial efficiency (measured by the number of pending processes per judge). The findings indicated that the impact of cooperative banks on income distribution after a crisis period holds particular significance in smaller municipalities with elevated levels of industrial and financial development. On the contrary, the degree of judicial efficiency appeared to have no significant impact.

Our findings carry significant policy implications. First, policymakers should acknowledge the distinctiveness of cooperative banks while shaping banking regulations. An overarching regulatory approach that fails to account for the unique operational dynamics of cooperative banks may prove inadequate and potentially undermine their capacity to mitigate income inequalities

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[13] For reasons of space, in Table 10 we report the results for cooperative banks only. The estimates when considering non-cooperative banks are presented in Panel B of Table A.6

within local communities, particularly in the aftermath of a crisis. Second, given the relevance of cooperative banks' distinct characteristics for their impact on income distribution, safeguarding these banks from adopting a more commercially driven, profit-centric orientation is of paramount importance. Preserving the inherent principles of cooperative banking could be pivotal in maintaining their effectiveness in reducing income disparities. Finally, our results underscore the necessity of preventing the closure of cooperative bank branches in smaller municipalities. These areas hold the greatest promise for cooperative banks to exert substantial effects. Ensuring the presence and viability of cooperative bank branches in such municipalities could amplify their potential contributions to equitable income distribution, thus bolstering community resilience. In sum, a holistic policy approach that recognizes the specialized role of cooperative banks, safeguards their distinctiveness, and fosters their local presence holds promise for fostering more equitable post-crisis economic outcomes.

Declaration of competing interest

Data availability

The data that has been used is confidential.

Appendix

See Tables A.1–A.6.

Table A.1
Baseline results: bank branches, loans and deposits per km^2.

Dep. Variables	Panel A: Bank branches		Panel B: Bank loans and deposits			
	Financial crisis	Sovereign-debt crisis	Financial crisis		Sovereign-debt crisis	
	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index
	(1)	(2)	(3)	(4)	(5)	(6)
Coop bank branches per km^2	−1.423	0.688**				
	(0.902)	(0.283)				
Coop bank branches per km^2 ×Post-crisis	−0.172	−0.372*				
	(0.333)	(0.186)				
Other bank branches per km^2	−0.111	0.056				
	(0.163)	(0.136)				
Other bank branches per km^2 ×Post-crisis	0.148***	0.058				
	(0.048)	(0.067)				
Coop bank loans per km^2			−0.005		−0.001	
			(0.011)		(0.012)	
Coop bank loans per km^2 ×Post-crisis			−0.005**		−0.013***	
			(0.003)		(0.003)	
Other bank loans per km^2			0.014		0.008	
			(0.016)		(0.008)	
Other bank loans per km^2 ×Post-crisis			0.004		−0.005	
			(0.002)		(0.003)	
Coop bank deposits per km^2				−0.014		−0.014
				(0.012)		(0.012)
Coop bank deposits per km^2 ×Post-crisis				−0.005*		−0.012***
				(0.003)		(0.003)
Other bank deposits per km^2				−0.022		−0.000
				(0.014)		(0.008)
Other bank deposits per km^2 ×Post-crisis				0.005**		−0.005*
				(0.002)		(0.003)
Post-crisis	0.038	−0.012	0.043***	0.036**	0.027	0.027
	(0.051)	(0.052)	(0.016)	(0.016)	(0.018)	(0.019)
+ controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

(continued on next page)

Table A.1 (*continued*).

Dep. Variables	Panel A: Bank branches				Panel B: Bank loans and deposits			
	Financial crisis	Sovereign-debt crisis			Financial crisis		Sovereign-debt crisis	
	Gini index	Gini index			Gini index	Gini index	Gini index	Gini index
	(1)	(2)			(3)	(4)	(5)	(6)
Municipality FE	Yes	Yes			Yes	Yes	Yes	Yes
Observations	30,749	24,409			30,749	30,749	24,409	24,409
R-squared	0.007	0.005			0.006	0.006	0.006	0.006

Notes: The table shows regression coefficients. The dependent variable is reported at the top of each column. In columns (1) and (3)–(4), we focus on the financial crisis. Here, the Post-crisis dummy is equal to one in the years 2010–2011, and zero in the years 2008–2009. In columns (2) and (5)–(6), we focus on the sovereign-debt crisis. Here, the Post-crisis dummy is equal to one in the years 2014–2015, and zero in the years 2012–2013. Three, two and one star (*) mean, respectively, a 99, 95 and 90 percent level of significance. Standard errors clustered at the municipal level are in parentheses. All of the variables are defined in Table 1.

Table A.2

Addressing endogeneity issues: First stage estimations.

Dep. Variables	Panel A: Financial crisis							
	Coop bank branches (0/1) ×Post-crisis	Other bank branches (0/1) ×Post-crisis	Coop bank branches (0/1) ×Post-crisis	Other bank branches (0/1) ×Post-crisis	Coop bank branches per capita ×Post-crisis	Other bank branches per capita ×Post-crisis	Coop bank branches per capita ×Post-crisis	Other bank branches per capita ×Post-crisis
	(1)	(2)	(3)		(4)	(5)	(6)	
Popular banks in 1936 ×Post-crisis	0.044***	0.038***	0.044***	0.038***	−0.021***	−0.033***	−0.021***	−0.033***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.003)	(0.005)	(0.003)	(0.005)
Number of branches in 1936 ×Post-crisis	0.011***	−0.004***	0.011***	−0.004***	0.010***	0.004***	0.010***	0.004***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)
+ controls	Yes	Yes	Yes		Yes	Yes	Yes	
Observations	31,197	31,197	31,197		31,197	31,197	31,197	
F instruments	749.5	121.6	50.72		1746	100	12.45	

Dep. Variables	Panel B: Sovereign-debt crisis							
	Coop bank branches (0/1) ×Post-crisis	Other bank branches (0/1) ×Post-crisis	Coop bank branches (0/1) ×Post-crisis	Other bank branches (0/1) ×Post-crisis	Coop bank branches per capita ×Post-crisis	Other bank branches per capita ×Post-crisis	Coop bank branches per capita ×Post-crisis	Other bank branches per capita ×Post-crisis
	(1)	(2)	(3)		(4)	(5)	(6)	
Popular banks in 1936 ×Post-crisis	0.054***	0.020***	0.054***	0.020***	−0.021***	−0.044***	−0.021***	−0.044***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.003)	(0.005)	(0.003)	(0.005)
Number of branches in 1936 ×Post-crisis	0.010***	−0.004***	0.010***	−0.004***	0.010***	0.003***	0.010***	0.003***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
+ controls	Yes	Yes	Yes		Yes	Yes	Yes	
Observations	24,848	24,848	24,848		24,848	24,848	24,848	
F instruments	443.9	81.91	26.12		1261	75.75	26.39	

Notes: The table shows regression coefficients. The dependent variable is reported at the top of each column. In Panel A, we focus on the financial crisis. Here, the Post-crisis dummy is equal to one in the years 2010–2011, and zero in the years 2008–2009. In Panel B, we focus on the sovereign-debt crisis. Here, the Post-crisis dummy is equal to one in the years 2014–2015, and zero in the years 2012–2013. Three, two and one star (*) mean, respectively, a 99, 95 and 90 percent level of significance. Standard errors clustered at the municipal level are in parentheses. All of the variables are defined in Table 1.

Table A.3

Addressing endogeneity issues: Lagged variables.

Dep. variables	Panel A: Financial crisis						Panel B: Sovereign-debt crisis					
	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Lag. Coop bank branches (0/1)	0.108		0.107				−0.040		−0.034			
	(0.081)		(0.081)				(0.128)		(0.128)			

Table A.3 (*continued*).

Dep. variables	Panel A: Financial crisis						Panel B: Sovereign-debt crisis					
	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Lag. Coop bank branches (0/1) ×Post-crisis	0.003		−0.003				−0.075***		−0.070***			
	(0.020)		(0.020)				(0.024)		(0.025)			
Lag. Other bank branches (0/1)		−0.052	−0.051					0.104	0.100			
		(0.110)	(0.110)					(0.080)	(0.080)			
Lag. Other bank branches (0/1) ×Post-crisis		0.036*	0.036*					−0.055**	−0.046*			
		(0.020)	(0.020)					(0.025)	(0.025)			
Lag. Coop bank branches per capita				0.575***		0.582***				−0.092		−0.060
				(0.129)		(0.129)				(0.197)		(0.196)
Lag. Coop bank branches per capita ×Post-crisis				−0.094***		−0.102***				−0.084**		−0.109***
				(0.033)		(0.033)				(0.039)		(0.040)
Lag. Other bank branches per capita					0.195**	0.197**					0.162**	0.167**
					(0.085)	(0.085)					(0.067)	(0.067)
Lag. Other bank branches per capita ×Post-crisis					−0.046**	−0.052***					−0.154***	−0.161***
					(0.020)	(0.020)					(0.026)	(0.026)
Post-crisis	0.054***	0.031*	0.032*	0.138***	0.156***	0.167***	0.064***	0.076***	0.089***	0.128***	0.175***	0.186***
	(0.014)	(0.018)	(0.018)	(0.017)	(0.023)	(0.023)	(0.013)	(0.015)	(0.016)	(0.017)	(0.019)	(0.019)
+ controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	23,396	23,396	23,396	17,005	17,005	17,005	23,396	23,396	23,396	17,005	17,005	17,005
R-squared	0.003	0.003	0.003	0.017	0.017	0.018	0.004	0.004	0.005	0.017	0.020	0.021

Notes: The table shows regression coefficients. The dependent variable is reported at the top of each column. In Panel A, we focus on the financial crisis. Here, the Post-crisis dummy is equal to one in the years 2010–2011, and zero in the years 2008–2009. In Panel B, we focus on the sovereign-debt crisis. Here, the Post-crisis dummy is equal to one in the years 2014–2015, and zero in the years 2012–2013. Three, two and one star (*) mean, respectively, a 99, 95 and 90 percent level of significance. Standard errors clustered at the municipal level are in parentheses. All of the variables are defined in Table 1.

Table A.4

Heterogeneities: other bank branches.

Dep. Variables	Panel A: Urbanization											
	Financial crisis						Sovereign-debt crisis					
	Small municipalities (<5,000 inhabitants)		Medium municipalities (>5,000 < 15,000 inhabitants)		Large municipalities (>15,000 inhabitants)		Small municipalities (<5,000 inhabitants)		Medium municipalities (>5,000 < 15,000 inhabitants)		Large municipalities (<5,000 inhabitants)	
	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Coop bank branches (0/1)	−0.094		−0.061		0.192		0.075		0.090		0.109	
	(0.098)		(0.095)		(0.164)		(0.130)		(0.131)		(0.206)	
Coop bank branches (0/1) ×Post-crisis	−0.040*		−0.000		−0.071		−0.130***		−0.064		−0.059	
	(0.024)		(0.029)		(0.047)		(0.037)		(0.055)		(0.067)	
Other bank branches (0/1)	0.024		−0.085		0.061		0.034		0.170		−0.050	
	(0.110)		(0.150)		(0.714)		(0.067)		(0.180)		(0.361)	
Other bank branches (0/1) ×Post-crisis	−0.040*		0.145***		−0.081		−0.062**		−0.266*		−0.104	
	(0.022)		(0.036)		(0.064)		(0.030)		(0.154)		(0.346)	
Coop bank branches per capita		0.152		−0.252		0.556		0.244		1.093**		0.671
		(0.132)		(0.272)		(0.467)		(0.149)		(0.446)		(1.213)
Coop bank branches per capita ×Post-crisis		−0.008		−0.056		−0.128		−0.147***		−0.460		0.142
		(0.131)		(0.072)		(0.090)		(0.044)		(0.309)		(0.553)
Other bank branches per capita		0.084		0.114		1.060**		0.102*		0.916***		0.816**
		(0.089)		(0.136)		(0.481)		(0.054)		(0.213)		(0.352)

Table A.4 (*continued*).

Other bank branches per capita ×Post-crisis		−0.121***		−0.022		−0.241***		−0.190***		−0.342**		−0.901***
		(0.020)		(0.041)		(0.074)		(0.029)		(0.143)		(0.219)
Post-crisis	0.068***	0.102***	−0.024	0.107***	0.233***	0.243***	0.024	0.051**	0.314**	0.174***	0.209	0.350***
	(0.020)	(0.017)	(0.039)	(0.032)	(0.069)	(0.054)	(0.024)	(0.021)	(0.153)	(0.057)	(0.349)	(0.074)
+ controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	21,632	21,632	6,631	6,631	2,934	2,934	17,314	17,314	5,204	5,204	2,330	2,330
R-squared	0.005	0.007	0.022	0.019	0.031	0.037	0.005	0.008	0.013	0.022	0.020	0.040

	Panel B: Industry structure							
	Financial crisis				Sovereign-debt crisis			
	Number of productive units < mean		Number of productive units < mean		Number of productive units < mean		Number of productive units < mean	
	(1)	(2)	(3)	(4)	(7)	(8)	(9)	(10)
Coop bank branches (0/1)	0.042		−0.195**		0.013		0.166	
	(0.097)		(0.096)		(0.120)		(0.118)	
Coop bank branches (0/1) ×Post-crisis	−0.022		−0.028		0.020		−0.100***	
	(0.026)		(0.025)		(0.037)		(0.038)	
Other bank branches (0/1)	−0.045		0.245		−0.018		0.137	
	(0.111)		(0.161)		(0.068)		(0.107)	
Other bank branches (0/1) ×Post-crisis	−0.030		0.039		0.057*		−0.028	
	(0.024)		(0.028)		(0.030)		(0.051)	
Coop bank branches per capita		0.531***		−0.267		0.224		0.299
		(0.168)		(0.187)		(0.177)		(0.183)
Coop bank branches per capita ×Post-crisis		−0.122***		−0.163***		−0.043		−0.142**
		(0.044)		(0.040)		(0.061)		(0.061)
Other bank branches per capita		−0.014		0.284***		0.072		0.081
		(0.104)		(0.107)		(0.072)		(0.065)
Other bank branches per capita ×Post-crisis		−0.153***		−0.070***		−0.041		−0.053
		(0.026)		(0.024)		(0.044)		(0.039)
Post-crisis	0.104***	0.148***	0.016	0.079***	0.033	0.096***	−0.102**	−0.131***
	(0.022)	(0.020)	(0.028)	(0.022)	(0.024)	(0.021)	(0.052)	(0.034)
+ controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	17,378	15,651	13,819	15,546	14,108	12,776	10,740	12,072
R-squared	0.013	0.018	0.007	0.008	0.008	0.009	0.016	0.019

Notes: The table shows regression coefficients. The dependent variable is reported at the top of each column. In columns (1)–(6), we focus on the financial crisis. Here, the Post-crisis dummy is equal to one in the years 2010–2011, and zero in the years 2008–2009. In columns (7)–(12), we focus on the sovereign-debt crisis. Here, the Post-crisis dummy is equal to one in the years 2014–2015, and zero in the years 2012–2013. Three, two and one star (*) mean, respectively, a 99, 95 and 90 percent level of significance. Standard errors clustered at the municipal level are in parentheses. All of the variables are defined in Table 1.

Table A.5
Heterogeneities: other bank branches (cont.).

Dep. Variables	Panel A: Financial development (bank deposits per capita)							
	Financial crisis				Sovereign-debt crisis			
	Deposits < median		Deposits > median		Deposits < median		Deposits > median	
	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Coop bank branches (0/1)	0.057		−0.145**		0.134		0.069	
	(0.149)		(0.066)		(0.152)		(0.093)	
Coop bank branches (0/1) ×Post-crisis	0.009		−0.025		0.081		−0.048*	
	(0.038)		(0.019)		(0.072)		(0.027)	
Other bank branches (0/1)	0.049		0.297		0.027		0.001	
	(0.143)		(0.258)		(0.092)		(0.143)	

(continued on next page)

Table A.5 (*continued*).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Other bank branches (0/1) ×Post-crisis	0.014		0.041		0.053		0.059	
	(0.028)		(0.036)		(0.039)		(0.048)	
Coop bank branches per capita		0.162		−0.898***		0.235		0.639***
		(0.163)		(0.254)		(0.207)		(0.190)
Coop bank branches per capita ×Post-crisis		−0.035		−0.254***		0.070		−0.282***
		(0.052)		(0.031)		(0.179)		(0.044)
Other bank branches per capita		0.212		0.244**		0.062		0.710***
		(0.145)		(0.108)		(0.101)		(0.107)
Other bank branches per capita ×Post-crisis		−0.107***		−0.150***		0.024		−0.264***
		(0.035)		(0.020)		(0.085)		(0.029)
Post-crisis	0.037	0.071***	0.020	0.179***	0.005	0.026	−0.105**	0.136***
	(0.023)	(0.022)	(0.039)	(0.019)	(0.027)	(0.025)	(0.051)	(0.029)
+ controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	16,328	16,328	14,869	14,869	12,571	12,571	12,277	12,277
R-squared	0.009	0.010	0.006	0.015	0.005	0.005	0.012	0.029

Panel B: Financial development (bank loans per capita)

	Financial crisis				Sovereign-debt crisis			
	Loans < median		Loans > median		Loans < median		Loans > median	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Coop bank branches (0/1)	0.174		−0.154**		0.128		0.010	
	(0.161)		(0.064)		(0.162)		(0.088)	
Coop bank branches (0/1) ×Post-crisis	0.002		−0.017		0.091		−0.017	
	(0.042)		(0.019)		(0.066)		(0.026)	
Other bank branches (0/1)	0.026		0.283		0.006		−0.098	
	(0.147)		(0.229)		(0.083)		(0.146)	
Other bank branches (0/1) ×Post-crisis	0.035		−0.004		0.056		0.055	
	(0.028)		(0.036)		(0.037)		(0.048)	
Coop bank branches per capita		0.168		−0.917***		0.127		0.572***
		(0.162)		(0.251)		(0.194)		(0.183)
Coop bank branches per capita ×Post-crisis		−0.027		−0.263***		0.024		−0.250***
		(0.053)		(0.032)		(0.104)		(0.044)
Other bank branches per capita		0.104		0.259**		0.023		0.673***
		(0.138)		(0.109)		(0.087)		(0.109)
Other bank branches per capita ×Post-crisis		−0.080**		−0.178***		−0.007		−0.314***
		(0.033)		(0.021)		(0.064)		(0.031)
Post-crisis	0.017	0.053**	0.064	0.201***	0.003	0.035	−0.144***	0.120***
	(0.023)	(0.022)	(0.039)	(0.020)	(0.026)	(0.024)	(0.053)	(0.029)
+ controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	15,834	15,834	15,363	15,363	12,589	12,589	12,259	12,259
R-squared	0.010	0.011	0.007	0.017	0.006	0.006	0.014	0.032

Notes: The table shows regression coefficients. The dependent variable is reported at the top of each column. In columns (1)–(4), we focus on the financial crisis. Here, the Post-crisis dummy is equal to one in the years 2010–2011, and zero in the years 2008–2009. In columns (5)–(8), we focus on the sovereign-debt crisis. Here, the Post-crisis dummy is equal to one in the years 2014–2015, and zero in the years 2012–2013. Three, two and one star (*) mean, respectively, a 99, 95 and 90 percent level of significance. Standard errors clustered at the municipal level are in parentheses. All of the variables are defined in Table 1.

Table A.6

Heterogeneities: other bank branches (cont.).

Dep. Variables	Judicial efficiency							
	Financial crisis				Sovereign-debt crisis			
	Pending processes < median		Pending processes > median		Pending processes < median		Pending processes > median	
	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Coop bank branches (0/1)	−0.273*		0.051		0.004		0.142**	
	(0.145)		(0.064)		(0.191)		(0.070)	

Table A.6 (*continued*).

Dep. Variables	Judicial efficiency							
	Financial crisis				Sovereign-debt crisis			
	Pending processes < median		Pending processes > median		Pending processes < median		Pending processes > median	
	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index	Gini index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Coop bank branches (0/1) ×Post-crisis	−0.048		−0.018		−0.141***		−0.041*	
	(0.032)		(0.019)		(0.040)		(0.024)	
Other bank branches (0/1)	0.021		0.050		−0.007		0.019	
	(0.163)		(0.093)		(0.087)		(0.062)	
Other bank branches (0/1) ×Post-crisis	0.089***		−0.091***		0.043		−0.094***	
	(0.030)		(0.019)		(0.040)		(0.025)	
Coop bank branches per capita		0.021		0.248*		0.238		0.404***
		(0.187)		(0.129)		(0.192)		(0.154)
Coop bank branches per capita ×Post-crisis		−0.114***		−0.211***		−0.125**		−0.192***
		(0.040)		(0.046)		(0.050)		(0.061)
Other bank branches per capita		0.087		0.153*		0.031		0.229***
		(0.125)		(0.080)		(0.061)		(0.072)
Other bank branches per capita ×Post-crisis		−0.048*		−0.225***		−0.126***		−0.283***
		(0.026)		(0.024)		(0.034)		(0.034)
Post-crisis	−0.037	0.043*	0.139***	0.168***	−0.135***	−0.062*	0.121***	0.142***
	(0.029)	(0.025)	(0.019)	(0.016)	(0.038)	−0.032	(0.021)	(0.018)
+ controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14,337	14,337	16,860	16,860	11,234	11,234	13,614	13,614
R-squared	0.005	0.005	0.023	0.029	0.008	0.009	0.014	0.021

Notes: The table shows regression coefficients. The dependent variable is reported at the top of each column. In columns (1)–(4), we focus on the financial crisis. Here, the Post-crisis dummy is equal to one in the years 2010–2011, and zero in the years 2008–2009. In columns (5)–(8), we focus on the sovereign-debt crisis. Here, the Post-crisis dummy is equal to one in the years 2014–2015, and zero in the years 2012–2013. Three, two and one star (*) mean, respectively, a 99, 95 and 90 percent level of significance. Standard errors clustered at the municipal level are in parentheses. All of the variables are defined in Table 1.

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