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NOT ALL BANKS ARE EQUAL. COOPERATIVE BANKING AND INCOME INEQUALITY*

Raoul Minetti, Pierluigi Murro and Valentina Peruzzi†

Abstract

This paper studies the role of different types of credit institutions in income inequality. By analyzing Italian local (provincial) credit markets over the 2001-2011 period, we find that cooperative banks mitigate income inequality in local communities more than their commercial counterparts. The results also suggest that it is the specific nature and orientation of cooperative banks, more than their relationship lending technologies, that improve income distribution. The impact of cooperative banking on inequality appears however to be partly channeled by a reduced dynamism of local economies, especially lower migratory flows and business turnover. (*JEL* G21, G38, O15)

I. INTRODUCTION

Financial institutions can play a critical role in mitigating income inequality. By reducing transaction costs and information asymmetries, improving the allocation of financial resources, and promoting the hedging and sharing of risk, financial institutions can foster financial inclusion, reduce income inequality and alleviate poverty (King and Levine, 1993; Beck and Levine, 2004). Although the literature has extensively investigated these arguments, it has generally considered

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homogeneous financial institutions, without distinguishing the effect of different categories of financial intermediaries. Yet, financial institutions feature pronounced heterogeneities both in their lending technologies and in the goals they pursue with their lending activities.

A particularly compelling difference is that between commercial and cooperative banking. Cooperative banks have a comparative advantage in funding informationally opaque borrowers through their local orientation and their "relationship lending" technologies. This could have a beneficial effect on inequalities (Angelini et al., 1998; Berger et al., 2004; Liang, 2008). A local bank operating in a small community, owned and/or managed by community members, may take advantage of privileged information in its lending activity, thus improving financial inclusion. Perhaps even more relevant, cooperative banks can pursue different goals from commercial banks. It is frequently argued that the commitment to support local communities by reinvesting a significant portion of profits back into the territory may make cooperative banks more effective in improving income distribution (EACB, 2018).[1] Clearly, investigating the role of different types of credit institutions in income inequality can not only further our understanding of the finance-inequality nexus but also yield insights into the design of banking policies and regulations that help reduce inequalities.

The aim of this study is to investigate whether the nature of credit institutions, especially their engagement in cooperative or commercial banking, plays a role in shaping income inequalities. To this end, we analyze Italian local credit markets (provinces) over the 2001-2011 period and combine rich and partly hand-collected data from three main sources, the Italian Ministry of Economics and Finance, the Bank of Italy, and the Italian National Statistics Office (Istat). Italy provides an ideal environment to study the impact of cooperative banks on income inequality. As the stock market capitalization is still low, the Italian financial system is dominated by the banking sector and firms heavily rely on banks for external financing.[2] Among banks, a crucial role is played by cooperative ones. According to Cihák and Hesse (2007), in the European Union cooperative banks' market share rose from 9 to 15 percent from the mid-1990s to 2004 in terms of total assets.[3] As

[1] In Section III, we provide a detailed discussion and anecdotal evidence on the goals of cooperative banks.

[2] In 2011, the stock market capitalization, as a percentage of the gross domestic product, was almost 18 percent in Italy, compared to 100 percent in the United States (Minetti et al., 2015). On average, over the 2000-2010 period, the ratio of bank credit over GDP was 72.36 percent, a figure similar to that of France (82.02 percent), Belgium (85.23 percent) and Finland (84.35 percent). At the end of 2010, bank lending to Italian firms was equal to 57 percent of GDP, compared with 43 percent in France and 36 percent in Germany (De Bonis et al., 2012).

[3] In 2012 the European Union had 4,000 cooperative banks with 72,000 branches, more than 850,000 employees, 56 million members, 4034 billion euro of loans (Fiordelisi and Mare, 2014).

documented by Becchetti et al. (2016), the increase in the market share of cooperative banks was even more pronounced in the Italian banking sector. Further, the historical segmentation of the Italian local (provincial) credit markets provides us with a unique empirical setting characterized by exogenous heterogeneity in the local importance of different types of credit institutions. On the inequality side, Italy has experienced pronounced income inequality in recent decades. Figure 1 shows the degree of income inequality, as measured by the Gini coefficient, over the time frame of our analysis for the whole country and for its macro areas. The figure reveals relatively high levels of the Gini, pointing also to cross-sectional and intertemporal variation in inequality.

The estimation results reveal that cooperative banks reduce income inequality significantly more than their commercial counterparts. This finding is robust to using different measures of income inequality and different proxies of local banking structure (cooperative bank branches, popular bank branches, commercial bank branches). It is also robust to a battery of estimation techniques, including panel fixed effects models and instrumental variable approaches.[4] In particular, when instrumenting for the local presence of cooperative banks, we exploit the regulation of the Italian banking sector, which significantly affected the ability of different categories of credit institutions to grow in local markets. Moreover, we find that the effect of cooperative banks on income inequality remains significant even controlling for the pervasiveness of relationship lending in the provinces, suggesting that cooperative banks have a beneficial effect on inequality that is not entirely explained by their lending technologies.

The analysis then turns to investigate the channels through which cooperative banks mitigate income inequality. In investigating the channels of influence we are guided by the predictions of previous literature on the finance-inequality nexus and by anecdotal evidence on the activities undertaken by Italian cooperative banks in the alleviation of inequality and poverty. In particular, we focus on the role played by the effects of cooperative banking on urbanization, migratory flows, material infrastructures, entrepreneurship, labor force participation and human capital. Estimation results indicate that the reduction of income inequality produced by cooperative banks is mainly channeled by a reduction of migratory flows and a lower turnover of local businesses. Thus, the findings suggest that the impact of cooperative banking on inequality could be partly driven by

[4]In additional tests presented in the Appendix, we also show that the results are robust to using an Arellano-Bond model.

some reduction in the degree of dynamism and turnover in local communities. On the other hand, we find no evidence that cooperative banks reduce inequality by fostering labor force participation or the formation of human capital.

The remainder of the paper is organized as follows. Section II reviews prior literature on the link between finance and inequality. Section III lays out testable hypotheses and presents anecdotal evidence on the role of cooperative banks in income inequality in Italy. Section VI describes the data and the econometric approach. Section V discusses the main empirical results. In Section VI, we dissect the mechanisms underlying our main findings. Section VII concludes. Details on the data and additional empirical results are relegated to the Appendix.

II. PRIOR LITERATURE

Well-functioning financial intermediaries can allow market participants to take advantage of effective investments and growth opportunities, thus reducing inequalities (King and Levine, 1993; Beck and Levine, 2004).[5] The theoretical literature highlights different channels through which financial development can reduce inequality. First, financial development may allow low-income individuals to invest in education (Galor and Zeira, 1993; Aghion and Bolton, 1997; Galor and Moav, 2004). Second, financial development may decrease borrowing costs and collateral requirements. This can promote entrepreneurship, including small and disadvantaged entrepreneurial initiatives (Banerjee and Newman, 1993). Third, financial development may alter the distribution of income through an increased labour demand by firms, which may benefit low-income employees (Beck et al., 2010). Finally, financial development can also affect inequality by influencing migratory flows and the degree of depopulation of local communities (De Rosa, 1980).

A growing empirical literature has tested these predictions. Using data for large sets of countries and several decades, Li et al. (1998) and Clarke et al. (2006) find that financial development reduces income inequality. Analyzing over 70 countries, Beck et al. (2007) show that financial development disproportionately raises the income of the poorest quintile of the distribution.[6] Gine and Townsend (2004) find that in Thailand access to financial services moderates income inequality through an

[5] Financial intermediaries can reduce the frictions stemming from transaction costs and asymmetric information, provide ways of transferring resources through time, across borders, and among industries, and help firms and individuals to handle uncertainty by hedging, pooling, and pricing risks.

[6] Ravallion (2001) also uncovers a positive effect of finance on poverty reduction.

increase in labour demand. Burgess and Pande (2005) indicate that local financial development reduces rural poverty in Indian states while Beck et al. (2010) document that the U.S. bank deregulation increased incomes in the lower tail. And D'Onofrio et al. (2019) find that banking development mitigates income inequality in Italy. Some studies (e.g., Greenwood and Jovanovic, 1990) also show that the link between financial development and income inequality may be non-linear but depend on the level of economic development.

In spite of this broad literature on the finance-inequality nexus, the relative impact of different types of financial intermediaries, such as cooperative and commercial banks, on inequality has not been properly investigated. Our paper contributes to this literature by investigating whether, and through which channels, different types of financial intermediaries have different effects on income inequality. By highlighting a beneficial role of cooperative banks on income distribution, we also offer new insights to the literature on cooperative banking.

III. HYPOTHESES FRAMING AND ANECDOTAL EVIDENCE

The ownership and control structure of cooperative banks is instrumental to their goals and lending technologies (Ferri et al., 2014; Fiordelisi and Mare, 2014; Becchetti et al., 2016).[7] First, cooperative banks' ownership is not transferrable, is limited to individual equity shares, and is redeemable only at the nominal value. In addition, as cooperative banks are mainly locally based and have strong ties with the communities they serve, cooperative banks' members are also the banks' main customers. Second, in terms of control and governance, the primary characteristic of cooperative banks is the "one-member one-vote" rule, regardless of the amount of capital owned. As a consequence, members cannot accumulate votes by underwriting new shares. Finally, and perhaps most importantly, cooperative banks aim at maximizing members' value by offering products and services along with the distribution of profits.

A. Technologies and Goals of Cooperative Banks

[7]The International Cooperative Alliance defines a cooperative bank as "an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly-owned and democratically controlled enterprise. Cooperatives are based on the values of self-help, self-responsibility, democracy, equality, equity and solidarity. In the tradition of their founders, co-operative members believe in the ethical values of honesty, openness, social responsibility and caring for others" (ICA, 2007).

Cooperative banks can differ from commercial banks both in their predominant lending technologies and in the goals of their lending activities. Consider first lending technologies. Cooperative banks taking part in the life of a community, owned and/or managed by community members, develop lending relationships that allow them to garner "soft" (not easily quantified or transferrable) information on borrowers, possibly improving financial inclusion (Petersen and Rajan, 1994; Berger and Udell, 2006).[8] Large banks can instead encounter difficulties in collecting and transmitting soft information through the communication channels of their organizations, as they are on average headquartered at larger distances from local borrowers (Stein, 2002; Alessandrini et al., 2008).[9] Banerjee et al. (1994) add that the lending technologies of cooperative banks can build not only on lending relationships, but also on group interactions within the local communities and on group incentive schemes, such that access to credit for a community member depends on the loan performance of all the others.[10] The empirical literature generally supports the hypothesis that small and cooperative banks are advantaged in lending to informationally opaque borrowers (Berger and Udell, 2006; Strahan and Weston, 1998). Using sectoral data, Cannari and Signorini (1997) suggest that the availability of credit in Italy is larger for cooperative banks' customers than for comparable pools of borrowers. Ferri et al. (2014; 2019) show that, because of their ability to screen and monitor informationally opaque borrowers, local and cooperative banks reduce less the availability of credit during crises than other credit institutions.

The second key dimension along which cooperative banks can differ from commercial banks is the goals of their lending activity. These goals have been evident since the dawn of cooperative banking. Discussing the diffusion of cooperative banks in the second half of the 1800s, Salvioni (1883) wrote that these were born as part of "the effort of disadvantaged categories of the population to improve their conditions".[11] Turning to recent times, in its 2019 annual report, Federcasse, the Italian association of cooperative banks, listed the reduction of inequality and the mitigation of

[8] By contrast, under transactional lending the borrower's creditworthiness is assessed on the basis of "hard" information which is quantifiable and easily transferrable, such as financial statements, payments histories or credit scores (Berger and Udell, 2006).

[9] A downside is that local banks may suffer more from scale inefficiencies and be exposed to local political capture and higher indulgence toward local businesses, thus undermining the quality of credit (Wheelock and Wilson, 2000; Becchetti et al., 2016).

[10] Although Banerjee et al. (1994) focus on developing or rural economies, analogous mechanisms may operate in local communities of industrialized countries (Angelini et al., 1998).

[11] Among the goals of the nascent cooperative banks in rural communities in the second half of the 1800s, Ardoino (1896) listed the access of farmers to long-term credit; the reduction of the interest burden on loans; a greater flexibility in loan repayment schemes; a reduction in mortgage expenses.

poverty as two of the top priorities of cooperative banking in Italy, stressing that these priorities shape an "alternative view to conduct financing". These goals also emerge from the documents of individual cooperative banks. For example, Banca della Marca, a cooperative bank operating in the northern Italian region of Veneto, stresses in its documents that through its activity it aims at supporting "projects and initiatives that promote social inclusion in the local territory and activities of social investment that favor the well-being and quality of life of all members of local communities".

B. Anecdotal Evidence

There is rich anecdotal evidence on the role of Italian cooperative banks in promoting the reduction of income inequality and poverty.[12] According to annual reports of Federcasse, cooperative banks promote financial inclusion in small municipalities, in remote interior areas, and in urban peripheries. In these areas, they actively engage in the financing of disadvantaged borrowers and of small and social entrepreneurial initiatives (including microcredit), and they establish partnerships with institutions that target poverty reduction and social inclusion. On the household side, cooperative banks disproportionately fund mortgages to young couples and individuals with precarious jobs (e.g., through the Consap guarantee scheme). This reduces the burden of mortgage expenses for these disadvantaged categories. With the "Social Start" initiative, the aforementioned cooperative bank Banca della Marca made available funding for the social inclusion of disadvantaged, unemployed, and elderly people and of individuals with physical disabilities. Similarly, it supported households experiencing difficulties in daily life management and promoted educational support for minors with learning difficulties. The cooperative bank of Cortina d'Ampezzo and Dolomiti, in the northern regions of Trentino-Alto Adige and Veneto, engaged in the project "La povertà a casa nostra", supporting education and medical expenses of households experiencing financial difficulties. And in 2009, in the provinces of Rome and Frosinone, in the central region of Lazio, the cooperative bank Banca di Bellegra started the project "Microcredito Sociale" aimed at supporting households at risk of poverty and that experienced difficulties in the payment of rents, education expenses for children, and daily household management. On the firm side, Italian cooperative banks participate disproportionately in the public guarantee fund for SMEs, sustaining small entrepreneurial activi-

[12]The anecdotal evidence in this section is drawn from documents and reports of individual cooperative banks and of their national association. More details are available from the authors.

ties that could otherwise remain unfunded, such as women-led firms and social cooperatives.[13] For instance, the cooperative bank of Casalgrasso e Sant'Albano Stura, in the North-West of Italy, was praised by the local craftsmen association for financing micro and small craftsmen's enterprises, which often faced difficult access to credit. The cooperative bank of Busto Garolfo e Buguggiate, in the northern region of Lombardia, financed several non-profit entities involved in promoting local employment, the education and training of minors, and the assistance of elderly individuals. And the cooperative bank Gaudiano di Lavello established an agreement with Consorzio di Garanzia Collettiva Fidi for the financing on cheap terms of disadvantaged micro and small enterprises in the southern region of Basilicata. Similar initiatives were undertaken by the cooperative banks Banca Alpi Marittime (in the northern region of Liguria) and Monte Pruno (in the southern region of Campania) in favor of women-led firms, young entrepreneurs, and disadvantaged categories.

According to Federcasse, cooperative banks also help stabilize economic conditions, often granting credit to individuals who have lost jobs and suspending payments from borrowers who incur difficulties. The cooperative bank of Busto Garolfo e Buguggiate, for instance, funded the project "Solidarietà per il Lavoro", promoted by social services of local municipalities to create temporary employment opportunities for people who lost their jobs. The cooperative bank of San Marco dei Cavoti e del Sannio made available funds to support small and medium-sized enterprises in temporary difficulty and, hence, contrast the phenomenon of usury in the province of Benevento, in the southern region of Campania. According to Federcasse, more than 50% of cooperative banks adhere to the "Accordo per il Credito" for the suspension of mortgage payments, typically approving about 90% of suspension requests. Cooperative banks also contribute to funding the recovery from natural disasters.

IV. DATA AND EMPIRICAL METHODOLOGY

A. Data Set and Measurement

The data employed to perform the empirical investigation are drawn from three main sources: (i) the Department of Finance of the Italian Ministry of Economics and Finance; (ii) the Statistical Bulletin of the Bank of Italy; (iii) and the Italian National Statistics Office (Istat). Specifically, we

[13]Cooperative banks generally refrain from imposing minimum investment scale requirements, which could otherwise prevent borrowing.

hand-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 types of bank branches per province from the Bank of Italy, and conditioning provincial information from the Italian National Statistics Office.

Since province-level data on income distribution are not available, we computed them starting from the income data. In particular, we downloaded the spreadsheets on the distribution of taxable income for each of the 8,056 Italian municipalities over the 2001-2011 period from the Department of Finance website.[14] For each municipality and each year, we have the frequency and the average income of 28 to 30 income classes.[15] We aggregated this information assigning each municipality to its province and computed the indicators traditionally used in the inequality literature (see Appendix Table A.1 for the definition of all variables). First, from the Lorenz curve, we derived the Gini coefficient of income distribution. The Gini coefficient takes the value of zero if everyone in the province has the same income, and the value of 1 if a single individual receives the income of the entire province. Second, as an alternative measure of income distribution, we computed the Theil index, which is also increasing in the degree of income inequality. This index is equal to zero when all the individuals in a province have the same income, and it is equal to *ln(n)*, with n representing the number of individuals, if one individual receives all of the province's income. Third, as a further measure of income inequality, we examine the ratio between the incomes of those at the 90th percentile and those at the 10th percentile, and the ratio between the incomes of those at the 75th percentile and those at the 25th percentile. Finally, we consider an inverse measure of poverty, given by the logarithm of incomes of those at the 10th percentile.

Following the banking literature, we use different measures of local banking structure. First, as our main independent variable, we use the number of cooperative bank branches in a province, normalized by the population of the province. Then, in order to analyze the impact of other credit institutions on income inequality, we computed the same measure also for popular banks (*Banche Popolari*) and commercial banks (*Spa*).[16] Branch density is a key indicator of financial inclusion

[14] We focused on the 2001-2011 period because taxable income data have been available since the beginning of 2000. Moreover, we preferred not to extend our analysis after 2011 because the banking deregulation started in the 1990s could make our instrumental variables less reliable in recent years.

[15] The reader could wonder whether tax evasion could inflate our proxies by affecting the lowest levels of the income distribution. However, there is evidence that the measures of income inequality constructed using tax records are highly correlated with the measures obtained using other sources (see, e.g., Acciari and Mocetti, 2013).

[16] Popular banks initially shared some common origins with cooperative banks. However, over the decades the two

and financial access, which are central elements in the nexus between banking development and inequality (Beck et al., 2007). The rationale for the use of branch density as a measure of local banking development is twofold. First, branch density displays a large dispersion among provinces and is largely affected by the 1936 Italian banking regulation (Benfratello et al., 2008). Second, the number of bank branches over the population is a suitable metric of the demographic penetration of banking services in the provincial credit markets (the relevant market in the Italian banking system) and, hence, of the accessibility of banking services.[17]

As conditioning information, we use a comprehensive set of province-level control variables. From the Istat database we drew information about per capita GDP, unemployment, the distribution of workers among sectors, the trade openness, and the Herfindahl-Hirschman index of bank branches.

Table 1 displays summary statistics for the variables used in the analysis. Appendix Table A.2 provides summary statistics at the regional level (a region comprises one or more provinces). Unsurprisingly, Table 1, Panel A, shows that commercial banks have the largest presence in the provinces, followed by cooperative banks, and finally by popular banks. Branch density is larger in northern provinces for all types of financial intermediaries, although cooperative and popular banks appear to be more homogeneously distributed in the Italian territory. Appendix Table A.2 also reveals that the average income inequality, measured by the Gini coefficient and the Theil index, exhibits variation across the Italian regions. On average, the regions of the South of Italy exhibit a lower per capita GDP and a higher unemployment rate. Conclusions similar to those of Tables 1 and A.2 can be drawn from Figure 2, which displays a map of the 103 Italian provinces by Gini coefficient (Figure 2a), and by density of cooperative (Figure 2b), commercial (Figure 2c), and popular bank branches (Figure 2d).

We also inspected the evolution of key variables over the sample period. In Figure 1, we displayed the evolution over time of the Gini coefficient in Italy and its macro areas. We also computed the coefficient of variation (standard deviation over mean) of the Gini for the individual provinces. As shown in Table 1, Panel B, there is dispersion in the coefficient of variation of the

types of banks diverged significantly in terms of statutes, organizational features, role of stakeholders, and goals. It is then important to keep the two types of banks carefully distinct in the analysis.

[17] An alternative measure could be the amount of cooperative banks' loans. However, such data on loans are not available at the provincial level.

Gini, with the first quartile at 0.062 and the third at 0.099. Figure 3 also displays the evolution over time of the presence of cooperative branches in the Italian regions.

B. *Econometric Specification*

To perform our empirical investigation, we start building an empirical model that estimates the impact of the local banking structure on income inequality. In particular, we employ the following regression set-up

$$Y_{pt} = \alpha_1 + \beta_1^{\intercal} B_{pt} + \beta_2^{\intercal} X_{pt} + \mu_p + \mu_t + \epsilon_{pt} \tag{1}$$

where Y_{pt} denotes, alternatively, one of our proxies of income inequality (i.e., the Gini coefficient or the Theil index) in province p and year t; B_{pt} is a vector of variables measuring the banking structure of province p in year t; X_{pt} is a vector of province-level control variables; μ_p is a vector of area dummies (or province fixed effects, in the fixed effects model); μ_t is a vector of time fixed effects and ϵ_{pt} is the error term. The coefficients of interest (β_1) capture the effect of the presence of different types of banks on income inequality in the province. In particular, the inclusion of controls for the branch density of non-cooperative types of banks in the province allows to effectively capture the differential impact of cooperative banks on inequality, beyond that of local banking development.

A relevant issue in estimating the impact of the local banking structure on income inequality is endogeneity. First, the relationship between cooperative banking and income distribution might be driven by reverse causality: a reduction in income inequality may stimulate the demand for financial services and the creation of cooperative banks aimed to sustain local agriculture and entrepreneurship. Second, local banking structure and income inequality might be jointly determined by unobserved factors. Considering the provinces of a single country enables us to reduce the risk of omitted variable bias and to implicitly control for differences in formal institutions. However, omitted factors might still be in place: for example, high social capital in a province could jointly explain income distribution and the presence of cooperative banks. To address this omitted variable problem, we exploit the panel dimension of our data set and estimate equation (1) with a province fixed effects model. Most of the omitted variable issues are likely to be rooted in the history of the provinces and, hence, province fixed effects can effectively control for them. Further, since Italian policies are organized by the national government and regional administrations have limited ability to set up measures affecting local inequality, the fixed effects approach is likely to be quite powerful

in addressing omitted variable issues.[18] Then, to alleviate reverse causality concerns, we use a two-stage least squares (2SLS) estimation technique. Let I_p be a vector of instruments correlated with the provincial banking structure, which affect income inequality only through the banking channel. The impact of these instruments on B_{pt} is captured by β_4 in the following equation:

$$B_{pt} = \beta_3^{\intercal} X_{pt} + \beta_4^{\intercal} I_p + \mu_p + \mu_t + u_{pt} \tag{2}$$

where X_{pt} is the vector of control variables of equation (1), I_p is the vector of instruments, μ_p is a vector of area dummies, μ_t is a vector of time fixed effects and u_{pt} is the residual.

To implement the 2SLS approach, we need an appropriate set of instruments. Following Guiso et al. (2004), Benfratello et al. (2008) and D'Onofrio et al. (2019), we exploit the 1936 Italian banking law and we choose as instruments three different indicators (all measured in 1936): the number of bank branches in the province (per 100,000 inhabitants), the number of savings banks in the province (per 100,000 inhabitants), and the number of popular banks (*Banche Popolari*) in the province (per 100,000 inhabitants).

The objective of the 1936 banking regulation was to enhance bank stability through restrictions on bank competition. The law imposed strict limits on the ability of different types of banks to open new branches. In particular, each credit institution was attributed to a geographical area of competence based on its presence in 1936 and its ability to grow and lend was restricted to that area.[19] Bank entry in local credit markets was fully liberalized only towards the end of the 1990s, but the 1936 banking regulation affected the local banking structure also in the following decades (Guiso et al., 2004). Hence, we expect the local tightness of the regulation to be correlated with the current local banking structure. As discussed by Guiso et al. (2004), in 1936 the distribution of types of banks across provinces, and hence, the constrictiveness of regulation in a province, did not reflect market forces but stemmed from "historical accident" and in particular from the interaction between previous waves of bank creation and the history of the Italian unification. In addition, the banking law was not designed looking at the needs of the provinces. In fact, differences in the restrictions on the various types of banks were related to differences in banks' connections with

[18] See also Ramcharan (2010) and Braggion et al. (2019) for an analogous identification strategy in the U.S. context.

[19] National banks could open branches only in the main cities; cooperative and local commercial banks could open branches in the province where they operated in 1936; savings banks could expand within the boundaries of the region (which comprises multiple provinces) where they operated in 1936.

the Fascist regime. Therefore, the 1936 banking law is unlikely to have any direct effect on income inequality nowadays.

V. MAIN RESULTS

A. Local Banking Structure and Income Inequality

In this section, we investigate the impact of the local banking structure, i.e. the local importance of cooperative, popular and commercial bank branches, on income inequality. Table 2 reports estimation results for the fixed effects (columns 1-4) and 2SLS models (columns 5-8).[20] Starting with our main independent variable, the density of cooperative bank branches in the province, the coefficient reported in column (1) indicates that a higher presence of cooperative banks in the local market is negatively associated with the level of income inequality. The estimated coefficient equals -0.013 and is statistically significant at the 5 percent level. This suggests that an increase by 10 percent of cooperative banks' branch density is associated with a reduction of about 0.4 percent of the provincial Gini coefficient. This effect of cooperative banks on inequality is fully robust to the inclusion of (the density of) all other categories of bank branches in the estimation (column 4), suggesting that it goes beyond an average impact of local banking development. The effect is further confirmed when we employ the 2SLS model (columns 5-8).[21]

Very different results are obtained for the other two categories of banks. Across estimation methods, we uncover no evidence of a significant impact of commercial banks' branch density on income inequality when we control for cooperative and popular banks' branch density in the provinces. As for popular banks, some evidence of a significant but positive impact on income inequality emerges when using the fixed effects model. However, this result vanishes when adopting the instrumental variable approach. Altogether, the estimates in Table 2 support the hypothesis that cooperative banks tighten income inequality at the provincial level significantly more than commercial and popular banks.[22]

[20] In the Appendix (Table A3), we also report the results obtained using the Arellano-Bond estimator.

[21] The magnitude of the estimated coefficients in columns (5)-(8) is not directly comparable to the fixed effects estimates (columns 1-4) as the IV model does not allow for the inclusion of province fixed effects. For a general discussion of the comparison between instrumented and non-instrumented estimates see, e.g., Jiang (2017).

[22] In additional tests, reported in the Appendix (Table A4, Panel A), we also experimented with including a proxy for the level of civic and social capital in the provinces. Following Guiso et al. (2016), we inserted the number of free towns in the province in the Middle Ages. A town is classified as a free town if it was a *commune* according to two historical maps of Italy contained in De Agostini (2007) in the years 1167 and 1300. The coefficient estimates of

To test the robustness of the results, in Table 3 we estimate the impact of the local banking structure on a set of alternative measures of income distribution: the Theil index (Panel A), the ratio between the incomes of those at the 90th percentile and those at the 10th percentile (Panel B), and the ratio between the incomes of those at the 75th percentile and those at the 25th percentile (Panel C). Moreover, we estimate the effect of the density of cooperative, popular, and commercial bank branches on the level of poverty in the province, by looking at the logarithm of income of those at the 10th percentile (Panel D). Estimation results indicate that cooperative bank branches are negatively associated with the Theil index of the province. As shown in column (1) of Panel A, an increase of 10 percent in the density of cooperative bank branches induces a reduction of about 0.8 percent of the Theil index (statistically significant at the 1 percent level). This result remains statistically significant when the model is estimated with 2SLS. The negative effect of cooperative banks on income inequality is further confirmed when we employ as dependent variable the ratio between the incomes of those at the 75th percentile and those at the 25th percentile (Panel C), whereas it is not significant when we consider the 90th and 10th percentiles (Panel B).

The estimation of the impact of cooperative banks on the level of poverty in the province (Panel D) yields further insights. As reported in columns (5)-(6) of the panel, the estimated coefficient for the cooperative bank branches variable is positive and statistically significant at the 5 percent level. This suggests that an increase in the density of cooperative banks raises the level of incomes of those at the 10th percentile of the distribution. Although the coefficients are no longer significant when we employ the 2SLS model, this result suggests that, at least in part, cooperative banks mitigate income inequality by increasing the income of the poorest.

B. Non-Linearities

The literature on the real effects of financial development suggests that a non-linear relationship can occur between bank branch density and income inequality. Theoretical models (see, e.g., Greenwood and Jovanovic, 1990; Deidda, 2006) suggest that financial development reduces income inequality when high levels of economic development are reached and larger segments of the population can access the growing financial markets. Because of fixed costs in the development of sophisticated financial institutions, at early stages of economic development only the rich could in-

the cooperative bank branches variable remain statistically significant after controlling for the level of social capital in the provinces.

stead benefit from mature financial institutions (Greenwood and Smith, 1997; Townsend and Ueda, 2006). Based on these theoretical arguments, in Table 4, Panel A, we reestimate our main regressions on the subsamples of provinces located in the North (Panel A), Center (Panel B) and South (Panel C) of Italy.[23] The three macro areas of the country differ in the degree of economic development, with the North and, to a lower extent the Center, featuring higher economic development than the South. Thus, one could expect a different effect of the presence of cooperative, popular, and commercial bank branches on income inequality in the three areas. Estimation results mostly confirm this expectation: the presence of cooperative bank branches is negatively related with the level of income inequality in the provinces located in the North and Center of Italy, whereas its effect is not statistically significant in the South of the country.

In Table 4, we also employ an alternative measure of economic development, the provincial GDP per capita (Panel B), and we further analyze whether the impact of the local banking structure on income inequality changes with the level of financial development and inclusion (Panels C and D). Estimation results yield interesting insights. First, we find that cooperative bank branches reduce income inequality in provinces with an average level of GDP per capita above the median over the 2001-2011 period. By contrast, their effect is not statistically significant where (our proxy of) economic development is lower than the median value. Second, we obtain that the level of financial development and financial inclusion in the local market affect the relationship between local banking structure and income inequality. The presence of cooperative bank branches appears to mitigate income inequality especially in provinces with low levels of financial development (bank branches over the population) and financial inclusion (share of the population with a bank account in the province).

C. Lending Technologies and Lending Volumes

We enrich the baseline estimates of Table 2 by exploring the role of lending technologies and lending volumes in the link between cooperative banking and income inequality.

Lending Technologies. The reader could wonder whether the negative impact of cooperative banks on income inequality is mainly attributable to their lending technology or to their objective function. In fact, small and local financial institutions are characterized by an extensive use of relationship

[23] We display the 2SLS regressions. The results for the fixed effects model are in Appendix Table A4.

lending techniques, which are found to reduce information asymmetries and liquidity constraints for informationally opaque borrowers (Rajan, 1992; Petersen and Rajan, 1994; Angelini et al., 1998). To test whether this is the case in our data, in Table 5, columns (1)-(2), we add as control variable an indicator of relationship lending, given by the average length of the bank-firm relationships in the province.[24] The coefficient estimates of the cooperative bank branches variable remain statistically significant and essentially unaltered after conditioning on the pervasiveness of relationship lending in the province. This suggests that it is the nature and goals of cooperative banks, even more than their lending technology, that mitigate income inequality.

Lending Volumes and Rationing. Recent papers have shown that lending volumes can play an important role in the evolution of the income distribution. Using rich loan-level data from a large European bank, Delis et al. (2019) find that banks' lending decisions can trigger a polarization of borrowers' income, exacerbating inequality. In particular, credit rationed individuals experience a progressive deterioration in their income while individuals who are granted loans experience an upward income trajectory. Our data do not allow to adequately capture this mechanism, as we lack micro-level information on the lending decisions of the different types of banks. Nonetheless, we experimented with augmenting our baseline specification with a measure of the average credit rationing in the local (provincial) credit markets. By relying on the Capitalia "Survey on Italian Manufacturing Firms" and the EFIGE survey, we classified as credit rationed the firms that applied for more bank credit without obtaining it and then computed the share of rationed firms in a province (see, e.g., Murro and Peruzzi, 2019, and Ferri et al., 2019). The results, displayed in columns (3)-(4) of Table 5, are consistent with the findings in Delis et al. (2019): our proxy for credit rationing in the local (provincial) market appears to exacerbate income inequality. The coefficient estimates of the cooperative bank branches variable remain statistically significant after conditioning on this measure of credit rationing in the province. This could suggest that the impact of cooperative banks also occurs through non-quantity rationing dimensions of lending (e.g., cost of loans and interest rate premia, or stringency of loan covenants). However, given the aggregate nature of the credit rationing proxy, and the lack of information on the intensity of rationing, more

[24] To build the relationship lending variable, we rely on two waves of the Capitalia "Survey on Italian Manufacturing Firms" and on the EFIGE survey, which cover the three year periods ending, respectively, in 2003, 2006 and 2009. These surveys have been used as a testing ground by many studies, including Benfratello et al. (2008), Minetti et al. (2015), and Ferri et al. (2019).

refined tests are needed to further probe these arguments.[25]

VI. DISENTANGLING THE CHANNELS OF INFLUENCE

In what follows, we take a step towards studying the mechanisms through which cooperative banking can mitigate income inequality. The finance-inequality literature highlights three main channels of possible influence: labor demand, entrepreneurship, and new firm creation (Beck et al., 2010). The banking literature provides evidence that, by reducing asymmetric information for opaque borrowers, small and local banks can improve SMEs' credit availability (Petersen and Rajan, 1994; Angelini et al., 1998). Finally, the anecdotal evidence from Italy discussed in Section III points to a role of Italian cooperative banks in mitigating the depopulation of local communities.

In Sections VI.A-VI.C, we investigate different structural channels through which the local banking structure can affect income inequality (see Table 6 for a summary of the channels and the single sections for a discussion of the mechanisms). Guided by the predictions of prior literature and by the anecdotal evidence from Italy, we focus on the role of urban structure and inter-province migratory flows (Table 7), material infrastructures and entrepreneurship (Table 8), labor force participation and education (Table 9). In each table, we perform two kinds of tests. First, we add these structural indicators to our baseline regressions and verify whether, and to what extent, they absorb the effect produced by the local banking structure on income inequality. Second, we test the direct impact of cooperative banks on these proxies of local socioeconomic structure.[26] In columns (1)-(2) of the tables, we carry over the baseline results from the previous section to better illustrate whether our coefficients of interest change once the structural indicators are accounted for.[27]

[25] In additional tests reported in the Appendix, we also estimated two further specifications. In the first (Table A4, Panel B), we reestimated the regressions of columns (3)-(4) of Table 5 by distinguishing between good and bad years (respectively, years with GDP growth below and above the median GDP growth). The estimates suggest that cooperative banks mitigate income inequality both in good and in bad times while rationing especially matters in bad times (in line with Delis et al., 2019). In the second specification (Table A4, Panel C), we also inserted the average loans to assets ratio of rationed and non-rationed firms (using again data from the Capitalia and the EFIGE surveys). Consistent with Delis et al. (2019), we find that an increase in loans to non-rationed firms raises inequality in the provinces.

[26] Some of the measures that we use to investigate these channels (i.e., the proxies for urbanization and migratory flows) are available only for the year 2001. For this reason, when testing the direct impact of cooperative banks on these measures, we refer to the first year of observation (2001). However, as these provincial socio-economic characteristics are highly stable over time and change only in the long run, we expect that the results carry through also for the whole 2001-2011 period.

[27] To avoid cluttering the tables, we present 2SLS estimation results. The results obtained with the fixed effects model yield the same insights and are reported in Appendix Table A5.

A. Urbanization and Migration

As noted, the Italian association of cooperative banks stresses that cooperative banks play an important role in reducing migration from local communities and the resulting depopulation of the communities. For example, one of the initiatives promoted by southern cooperative banks, "Resto al Sud", was aimed at reducing the migration from remote southern areas. In the North, with the "Social Start" initiative, Banca della Marca explicitly promoted the development of local communities to contrast also the depopulation of small municipalities. More broadly, Federcasse stresses the tendency of cooperative banks to support financial inclusion in small municipalities.

Prior literature predicts that both urbanization and migratory flows can have a significant impact on income inequality in local communities. Regarding the urban structure, Baum-Snow and Pavan (2013) and Behrens and Robert-Nicoud (2014) show that a more widespread urbanization and a lower concentration in big cities reduce income inequality. By generating productivity improvements through agglomeration economies, large cities promote segmentation and the selection of highly productive entrepreneurs, with adverse consequences on inequality. As for migratory flows, provinces with a large outflow of emigrants may experience a drain of human capital which can exacerbate inequality (Card, 2009; Blau and Kahn, 2015). Immigration may also intensify inequality in local communities through the inflow of relatively poor immigrants that tends to widen the income distribution. By investing in local communities, cooperative banks may reduce the incentives to emigrate and the consequent drain of human capital and workforce (De Rosa, 1980).[28]

Based on these arguments, in Table 7 we analyze the role of urban structure and migration flows in channeling the effects of cooperative banks on income inequality. We consider the following measures of urbanization and migratory flows: *Share of small municipality 2001*, given by the percentage of population living in small municipalities (less than 15,000 inhabitants) in the province in 2001 (columns 3-5); *Gross flow 2001*, measured by the logarithm of the gross migratory flow (immigration plus emigration) of the province in 2001 (columns 6-8). As displayed in column (5), we estimate a positive and significant impact of the presence of cooperative banks on the percentage of provincial population living in small municipalities. Estimation results, however, indicate that in our setting the urban structure does not significantly affect the Gini coefficient in the province. The

[28]The remittances of emigrants may however help moderate inequalities.

coefficients reported in columns (3)-(4) are negative but not statistically significant at conventional levels.

More compelling results are found for migratory flows. As columns (6)-(7) report, when migration is accounted for, the coefficients of our measures of local banking structure tend to lose their statistical significance. The relevance of the migration channel is confirmed by the fact that in columns (6)-(7) the gross migratory flow of the province appears to increase the level of income inequality and that in column (8) the presence of cooperative banks has a negative impact on gross migratory flows. Overall, consistent with the anecdotal evidence of Section III, the findings in Table 7 suggest that geographical mobility and, to a lesser extent, urbanization, could be a channel whereby cooperative banks mitigate income inequality.

B. Material Infrastructures and Entrepreneurship

The anecdotal evidence in Section III suggested that Italian cooperative banks play some role in promoting new entrepreneurial initiatives, including initiatives of young and female entrepreneurs. On the other hand, it also suggested that cooperative banks help support the growth of incumbent businesses, their resilience to usury, and the hiring of young people in incumbent firms. For instance, as discussed in Section III, the cooperative bank of San Marco dei Cavoti e del Sannio made available funds to support small and medium-sized enterprises in temporary difficulty and to contrast the phenomenon of usury in the southern region of Campania. And, in the North, the cooperative bank of Busto Garolfo e Buguggiate financed projects aimed at promoting the training and hiring of young workers in existing enterprises. This suggests that cooperative banks could reduce the need and appeal of self-employment in local communities, that is, the tendency, especially among young and unemployed individuals, to engage in self-employment and micro entrepreneurial activities (so-called "refugee" effect; see, e.g., Thurik et al., 2008). There is also some anecdotal evidence, though limited, of a role of cooperative banks in supporting local municipalities in financing material infrastructures, for example in the aftermath of natural disasters.

In Table 8, we investigate the effect of material infrastructures and entrepreneurship. Material infrastructures may have a negative impact on inequality because they can improve the access of the poor to productive opportunities (World Bank, 2003). Entrepreneurship, instead, may lead to a polarization of incomes, thus widening the income distribution (Astebro et al., 2011; Atems and

Shand, 2018; Halvarsson et al., 2018). In particular, there is evidence that entrepreneurial activities increase the income of some entrepreneurs, broadening the top of the income distribution, while most of the self-employed have average earnings lower than the population average. Hamilton (2000), for example, finds that the median self-employed earns less than median employee. Using respectively data from Germany and from South Korea, Schneck (2018) and Astebro et al. (2011) confirm that higher levels of entrepreneurship and self-employment tend to raise income polarization and inequality. Coppola and Di Laurea (2016) obtain analogous results for Italy.

In order to test these channels, we consider the following proxies of infrastructures and entrepreneurship: *Material infrastructure*, a composite indicator of material infrastructures in the province provided by Geoweb, which accounts for road networks, railways, ports, airports, environmental energy networks, and broadband services (columns 3-5); *New firms creation*, computed as the ratio of net entrant firms (newly registered firms minus deregistered firms) over incumbent firms in the province (columns 6-8). Consistent with our expectations, we find that material infrastructures reduce income inequality in the provinces. However, the coefficients of local banking structure remain essentially unaltered after conditioning on this variable (compare columns 3-4 with columns 1-2 in Table 8), and cooperative bank branches do not significantly affect the level of material infrastructures in the provinces (column 5). This result is in line with the observation that in Italy infrastructures are mostly financed through public (national and local government) budgets rather than through private funding (D'Onofrio et al., 2019). Regarding the entrepreneurship and self-employment channel, the estimates in columns (6)-(8) are in line with the arguments above: income inequalities are larger in provinces with higher levels of entrepreneurship. Moreover, the presence of cooperative banks in the province is negatively related to new firms' creation (column 8), suggesting that the negative effect of cooperative banks on income inequality is partially due to a negative impact on firm turnover in the provinces.

Taking stock of the results in Tables 7 and 8, at least in part cooperative banks appear to mitigate inequality in the provinces by reducing the overall turnover of population and businesses in the provinces. While a test of this argument is beyond the scope of the paper, this hints at a possible impact of cooperative banking on inequality through some reduction in the dynamism and turnover in local communities.

C. Labor force participation and education

Labor force participation and education could be channels whereby financial development affects income distribution (Beck et al., 2010). First, by relaxing firms' financing constraints, financial institutions may foster labor demand and promote labor force participation of low-income and female employees. Second, by allowing low-income individuals to invest in education, banks may reduce income inequality through an increase in human capital. Both mechanisms may be amplified in the case of cooperative banks, because of their local orientation and their commitment to support job creation in their communities. As noted in the discussion of the anecdotal evidence in Section III, some documents suggest that Italian cooperative banks support female labor force participation. For instance, the aforementioned Banca della Marca explicitly offered funding for promoting female labor force participation with its "Social Start" initiative. There is also some anecdotal evidence of cooperative banks offering scholarships and providing loans for the schooling of disadvantaged young people (see the annual reports of Federcasse).

In Table 9, we test the relevance of these channels by employing the following proxies of labor force participation and human capital: *Female rate of participation*, given by the female rate of participation in the labour market in the province (columns 3-5); *Share of graduates in the province*, given by the number of graduated people over the population in the province (columns 6-8). The estimates partially confirm the relevance of female participation in the labour market in reducing income inequality (columns 3-4), although the presence of cooperative banks in the province does not have a significant effect on this variable (column 5). Similarly, we do not find a significant impact of cooperative banks on our proxy for tertiary education in the province. This result is consistent with previous studies on Italy, which do not find a relationship between financial development and education due to the relevant role of public budgets in financing education and school development (D'Onofrio et al., 2019).

Overall, the estimates in Table 9 provide no support for a role of labor force participation and education in channeling the impact of cooperative banking on income inequality.

VII. CONCLUSIONS

In this paper we have investigated whether different types of credit institutions affect differently income inequalities by exploiting data from Italian provinces in the 2001-2011 period. We have

found that cooperative banks significantly reduce income inequality and more so than their commercial counterparts. We have tested the robustness of this result in different ways, using alternative measures of income inequality, different proxies of local banking structure and different estimation techniques. The results also show that the effect of cooperative banks remains significant even after controlling for the pervasiveness of relationship lending in the provinces. This suggests that it is the nature and orientation of cooperative banks, rather than their lending technology, that improves income distribution. The analysis has then turned to investigate the mechanisms whereby cooperative banks mitigate income inequality. Estimation results indicate that the reduction of income inequality produced by cooperative banks is mainly channeled by a reduction in migratory flows and in the turnover of local businesses. This suggests that the reduction of income inequality could be associated with some decrease in the dynamism and turnover in local economies.

Our results support the hypothesis that cooperative banks positively affect local economies by reducing income inequality. They also suggest relevant mechanisms of influence, although more work is needed to better ascertain the contribution of these channels to the finance-inequality nexus. Finally, in a policy perspective, the findings reveal a need for banking regulation and supervision to encompass banking business models in evaluating banks (Ayadi et al., 2012). The one-size-fits-all approach might not be suitable for cooperative banks and could weaken their ability to alleviate income inequalities in local communities.

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