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The Cooperative Bank Difference Before and After the Global Financial Crisis

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Abstract

We compare characteristics of the banks' specialization (cooperative *versus* non-cooperative) at world level in a time spell including the global financial crisis. Cooperative banks display higher net loans/total assets ratios, lower shares of derivatives over total assets and lower earning volatility than commercial banks. With a diff-in-diff approach we test whether the global financial crisis produced convergence/divergence in these indicators. We finally document that, in a conditional convergence specification, the net loans/total assets ratio is positively and significantly correlated with value added growth in some manufacturing sectors but not in others.

Keywords: bank specialization;
value added; global financial crisis.

JEL numbers G21, O40, E44.

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1. Introduction

As is well known, financial intermediaries, and among them specifically banks, perform a pivotal role in the financial system by pooling resources, transferring intertemporally and cross-sectionally economic value, providing ways of clearing and settling payments, allocating financial resources to the most productive destinations, managing risk and implementing price information (Bhattacharya and Thakor, 1993; Merton and Bodie, 2005). Financial instruments such as derivatives can play an important role by broadening the set of these traditional functions. Derivatives may in fact be conceived as “adapters” among different financial systems that are not fully integrated (Merton and Bodie, 2005; Haiss and Sammer, 2010), thereby helping to foster, among others, foreign direct investment financing. Given the above, it is no wonder that what has been observed in recent years is a positive nexus between finance and growth. In this longstanding literature tradition - probably one of the oldest and most established research fields in economics - well known benchmark references are those from King and Levine (1993) and Rousseau and Wachtel (1998).

However, the most recent empirical studies document a weakening of such favorable relationship in the last decades. Looking over the 1960-2003 period, Wachtel and Rousseau (2007 and 2011) find that the positive link between finance and growth is no more robust and disappears after 1989. Arcand, Berkes and Panizza (2012) find that the nexus between finance and real economy is non monotonic and conclude that too much finance can have non positive effects on the real economy. On the other hand, Easterly, Islam and Stiglitz (2000) show that output volatility grows when the share of the financial system is too high.

Our paper starts from the theoretical and empirical background described above, and compares the performances and characteristics of cooperative banks *versus* commercial (and investment) banks, their behavior during the global financial crisis and their nexus with value added growth. We start from the phenomenon of disintermediation where commercial banks have extensively moved from their lending activity towards proprietary trading, and derivative trading. This circumstance is highly likely to be a rational response of profit maximizing

entities to the increasing competition in the traditional intermediation activity, which led to a tightening of intermediation margins, thereby making alternative sources of income, such as service fees and gains from proprietary trading, relatively more attractive.¹We wonder whether this circumstance has applied to a lower extent to cooperative banks due to their characteristics (*i.e.* one share-one vote, more dispersed local ownership that sees in them a way to finance local economy, constraints on the distribution of profits that have to be accumulated into reserves), which make them more oriented toward traditional lending activities, and imply an implicit departure from straight profit maximization strategies (CEPS, 2010). In that sense, our empirical analysis can also assess whether profit maximization affects engagement in traditional intermediation activities in the current globalized financial scenario.

We test our hypothesis on a worldwide sample of banks during the global financial crisis. We analyse whether cooperative banks are different in terms of net loans/total assets ratios, earning volatility and derivatives over total assets, and we look for the presence of convergence/divergence effects over the long run and across time during the global financial crisis. We additionally investigate whether higher net loans/total assets ratios affect the growth of value added of different industrial sectors classified *ex-ante* on the basis of their technological intensity and dependence from external finance.

The paper is divided into five sections (including introduction and conclusions). Section 2 describes the characteristics of cooperative banks and their diffusion at the European and global level. In Section 3 we introduce our dataset and examine descriptive results. The empirical strategy and econometric findings are presented and discussed in Section 4.

¹ See, among others, Lopez Espinosa *et al.* (2011).

2. The Cooperative Banks difference debate

According to the International Cooperative Alliance (ICA) a cooperative bank is “*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). If ICA principles apply, they imply departures from a strict and plain profit maximisation strategy whenever the other cooperative goals mentioned in the ICA statement may come into conflict with it. Christensen *et al.* (2004) and Ayadi *et al.* (2009) discuss the point by arguing that cooperative banks may be conceived as “dual bottom line” institutions that aim to generate profits in order to survive and expand without having profit as their sole or even primary bottom line objective. Along this line of thought, Hesse and Cihák (2007) observe that cooperative banks maximise their customer surplus rather than profits. Cooperative banks are part of a wider set of non profit maximizing banks, which include also international financial institutions such as the World Bank and the International Monetary Fund (Canning *et al.*, 2003). This particular type of financial institutions play a non negligible role in the financial system and more if we look at their share of traditional intermediation activity.

At end of 2010 world level financial cooperatives reached over 621 million people in the G-20 nations, provided US\$3.6 trillion in loans, held US\$4.4 trillion in savings and US\$7.6 trillion in total assets (Weber and Remer, 2011). The International Cooperative Bank Association (ICBA) includes all cooperative banks located in different countries among which there are *Banche cooperative* and *Banche popolari* in Italy, *Building societies* and *Credit unions* in the UK, *Mutual savings and loans* and *Credit unions* in the United States. These are not all small sized banks; the *Crédit Agricole*, for instance, ranked ninth among the top 50 banks in terms of shareholder equity in 2008, while other insitutions such as *Rabobank*, *Caisse d'Epargne*, *Banque Populaire*, *Crédit Mutuel* occupied between the twentieth and the fortieth position. The role of cooperative banks is not negligible also in

terms of market shares. Bongini and Ferri (2007) document that cooperative banks account for about one third of the deposits (33.7 percent), and slightly less in terms of loans (29.5 percent), of the Italian banking industry. Cooperative branch shares in selected EU countries are even higher (60 percent of the total in France, 50 percent in Austria, and about 40 percent in Germany and the Netherlands) with their market share rising from 9 to 15 percent from mid 1990s to 2004 in terms of total assets in the EU according to Hesse and Cihák (2007). The same authors find that, even though cooperative banks account for a relevant share of bank total assets at world level (14 percent) and a higher share in terms of bank branches, they are far underrepresented in terms of investigation as evidenced by the 0.1 percent share of Econlit entries. Given the above, we argue that research on cooperative banks is urgently needed to fill a significant gap in the economic literature.

From a theoretical point of view, we expect that the different goal and the mission to finance local business of cooperative banks may have both pros and cons in terms of quality of credit. On the one hand, being smaller in size and with a stronger focus on local business, may produce those types of “arm-length relationships” that reduce informational asymmetries between lenders and borrowers thereby improving the quality of credit (Petersen and Rajan, 1994; Berger and Udell, 1995; Elsas, 2005). On the other hand, local banks may suffer more from scale inefficiencies due to their smaller dimensions (Wheelock and Wilson, 2010) and can be more exposed to the risk of local political capture and higher indulgence towards local business (a potential dark side of the “arm-length relationships”). In addition to that, coop banks are more likely to end up with insufficiently diversified loan portfolios if they are small and constrained to work in geographically delimited areas with low industry diversification (Gobbi, 2005). These last effects may conversely reduce the quality of credit. Last but not least, by being a subset of stakeholder value banks, cooperative banks tend to have lower propensity to take risk than shareholder value banks (Hansmann, 1996; Chaddad and Cook, 2004). According to CEPS (2010) this feature combined with (i) the use of customer surplus as a cushion, (ii) the affinity to a network that provides mutual support, and (iii) a reduced dependence from whole-funding markets, is likely to

produce lower earning volatility and relatively higher capacity of managing intertemporal risk.²

2.1 Empirical evidence on the cooperative bank difference and our contribution

From an empirical point of view, Altunbas *et al.* (2001) find no evidence of differences in efficiency related to different forms of bank specialization, while Hansmann (1996) and Chaddad and Cook (2004) observe that mutual financial institutions in the United States tend to adopt less risky strategies than demutualized ones. Hesse and Cihák (2007) show that cooperative banks have relatively higher financial stability with relatively less volatile returns. Groeneveld and de Vries (2009) find that cooperative banks have lower earning volatility (*i.e.* lower return on assets' standard deviation) in the 2002-2007 period for a small sample of about 45 large European banks. Brunetti *et al.* (2014) find that, after the global financial crisis, the probability of depositors' switching from cooperative to commercial banks has been lower than the reverse.

Within this framework a main proposition of our paper is that traditional credit activity occurs today in a very competitive environment with tiny profit margins. As a consequence, profit maximizing banks find relatively less convenient than cooperative non profit maximizing companies to dedicate their activity to traditional intermediation and commit a relatively lower share of their total assets to traditional lending activity and a relatively higher share to proprietary trading and derivative trading, an activity which promises potentially higher returns. We further argue that part of the difference between different bank' specialization in terms of net loans/total assets ratios is also due to their lower earning volatility which reduces liquidity risk. Finally, we wonder whether the observed differences between cooperative and non-cooperative banks have an influence on the real economy and, more specifically, on the value added growth of different industrial

² Mutual support takes different forms in different countries. Austrian *Raiffeisen* banks enjoy a joint-liability system at regional level plus a cross-guarantee national system providing liquidity to regional associations that are under difficulty. In other schemes, such as those of the Austrian *Volksbanken* and the French *Crédit Agricole* and *Crédit Mutuel*, member banks build paid-up funds. In other cooperative models (such as in Finland and in the Netherlands) member banks can use group pooled capital and reserves as a consolidated banking group (CEPS, 2010).

sectors defined in terms of high/low technology or high/low dependence from external finance.

Our paper is original with respect to the existing literature in several respects. More specifically, (i) we incorporate in the comparison between different banks' specialization the period after the global financial crisis; (ii) we investigate whether the cooperative/non-cooperative discriminant affects the derivatives/total assets ratio; (iii) we evaluate whether the hypothesis of lower earning volatility of cooperative banks is supported within the financial crisis period and we investigate the effect of the latter on the net loans/total assets ratio; (iv) we examine the impact of the cooperative bank difference on value added growth in different industries and, finally; (v) we test whether there is a long run (and/or financial crisis related) convergence/divergence process in the differences between coop and non coop banks.

3. Data and descriptive statistics

Our analysis focuses on a sample of 32 countries over the period 1998-2010 for a total of 140,660 bank-year observations.³ The data used are drawn from three different sources. Detailed information at bank level is taken from Bankscope. Data on value added of the manufacturing sectors at 3-digit level of ISIC (Revision 3) come from the 2013 edition of the INDSTAT4 database of the United Nations Industrial Development Organization (UNIDO). Time series on macroeconomic country variables such as GDP, investments, savings and education are retrieved from the World Development Indicators database.

Table 1 provides variables' definition, sources and level, while Table 2 presents the country breakdown of our bank-year observations.

[Table 1 about here]

[Table 2 about here]

³ The countries of analysis include Austria, Belgium, Brazil, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hong Kong, Hungary, India, Indonesia, Ireland, Italy, Japan, Republic of Korea, Luxembourg, Malaysia, Mexico, Netherlands, Poland, Portugal, Saudi Arabia, Singapore, South Africa, Spain, Sweden, Switzerland, Thailand, United Kingdom.

As already stated, we consider the cooperative/non cooperative bank characteristic to be an exogenous condition of the banks in our sample. Although this characteristic is time-invariant in the data since Bankscope provides the information on banks specialization based on their last annual report, we feel confident in assuming that it dates sufficiently back in the past. In addition to that, a change in the bank statute is often difficult and, therefore, uncommon. Given the large number of banks in our sample, it was not possible to keep track of all possible changes in status over the time period analysed. However, provided that this is a rare circumstance, we presume that this data limitation does not affect the results of our study.⁴

The share of cooperative banks in our sample is quite uneven in the 32 countries covered by the Bankscope database.⁵ More specifically, we find that cooperative banks account, in terms of total number of banks, for 66 percent of sample banks in Japan, 59 percent in Germany, 58 percent in Italy, 30 percent in Austria, 27 percent in Spain, 18 percent in Canada, 17 percent in France, 8 percent in Belgium, around 5 percent in Czech Republic, Denmark, Finland and India, between 3 and 1 percent in Greece, Hungary, South Korea, Luxembourg, Netherlands, Poland, Portugal and Switzerland, and less than 1 percent in Brazil, Malaysia, Mexico, Sweden and the United Kingdom.

Table 3 presents descriptive statistics for cooperative and non-cooperative banks. On average, cooperative banks have a net loans/total assets ratio of 58.8 percent compared to 53.6 percent of non-cooperative banks. From a descriptive point of view, this seems to confirm the expected stronger focus of cooperative banks on traditional intermediation activity. In terms of time dynamics we start with a 10 points difference in 1998 and end up with a narrower 3.3 points difference in 2010 (Figure 1).

[Figure 1 about here]

⁴ For a similar interpretation of the problem see Hesse and Cihák (2007).

⁵ We keep into account specific country effects in our econometric estimates with fixed effects and standard errors are clustered at bank/country level.

Cooperative banks also have a smaller share of derivatives over total assets (0.003 against 0.03) and they are far smaller in mean than non-cooperative banks (318 against 1,734 employees). However, the difference in size is driven by a few large banks since the distance in median is much less pronounced (113 against 179). If we look at income from the three main banking activities (loans, services and trading), as expected, cooperative banks have a higher share of income from traditional activities (defined as the ratio between income from credit and income from all of the three main bank activities).⁶ Moreover, cooperative banks have a tier 1 ratio that is slightly lower than non-cooperative banks (16.7 percent against 18.6 percent) and a higher share of impaired loans over gross loans (8.6 percent against 6 percent for non-cooperative banks). All of the above mentioned differences in means between cooperative and non-cooperative banks are significant at 99 percent.⁷

The result on the difference in earnings' volatility postulated by the theoretical literature, and found by Groenenveld and de Vries (2009) in small samples and by Hesse and Cihak (2007) in previous years, seems to be confirmed in our study (see Table 3). Cross-sectional standard deviation of Returns on Average Assets (ROAA) is more than four times larger for non-cooperative banks (with large cooperatives being slightly above the cooperative sample average), while standard deviation of Returns on Average Equity (ROAE) is almost twice as large. However, since we are interested in intertemporal risk management and earning volatility of each individual bank, within-bank intertemporal volatility is a more faithful indicator than cross-sectional volatility. We therefore calculate time series ROAA and ROAE standard deviations for each bank in our sample period. Time series ROAA and ROAE standard deviations are still far higher for non-cooperative than for cooperative banks (more than twice as much for ROAA and almost twice for ROAE) (see Table 3).

⁶ On the other hand, the share from non traditional activities is defined as the ratio between income from trading on derivatives and income from all of the three main bank activities. Thus, the shares from traditional and non traditional activities do not add up to one as we leave out that part of banks' income coming from services.

⁷ German cooperative banks are an exception since their derivative activity is not significantly different from that of German non-cooperative banks. Evidence is omitted for reasons of space and available upon request.

[Table 3 about here]

4. Empirical Strategy

In order to check whether the difference in intensity of traditional intermediation activity is robust when controlling for concurring factors, we estimate the following panel specification:

$$\begin{aligned} NetLoan/TotAss_{ijt} = & \alpha_0 + \alpha_1 Dcoop_{ijt} + \alpha_2 \ln(Size)_{ijt} + \alpha_3 ShareTrad_{ijt} + \\ & + \alpha_4 ShareNonTrad_{ijt} + \alpha_5 Deriv/TotAss_{ijt} + \\ & + \sum_j \beta_j DCountry_j + \sum_j \gamma_j CountryVar_{jt} + \\ & \sum_j \delta DBankType_j + \sum_t \theta DYear_t + \varepsilon_{ijt} \end{aligned}$$

where the dependent variable is the net loans to total assets ratio ($NetLoan/TotAss$) for the i -th bank in the j -th country measured at year t .⁸ Among right hand side variables, $Dcoop$ is a dummy variable taking value one if the bank specialization is cooperative and zero otherwise. The other $DBankType$ dummies include those controlling for Bank holding & holding companies, Finance companies, Investment & Trust Corporations, Investment Banks, Islamic Banks, Micro-Financing Institutions, Private Banking & Asset management companies, Real Estate & Mortgage Bank, Savings Bank, Securities Firm, Specialised Governmental Credit Institutions. The Commercial bank type is the omitted benchmark. Controls include the log of the number of employees – $\ln(Size)$ – as a proxy for bank size, the share of income from traditional and non traditional activities ($ShareTrad$ and $ShareNonTrad$, respectively), and the share of derivatives to total assets ($Deriv/TotAss$). All estimates include country ($DCountry$) and year ($DYear$) dummies. Beyond country dummies ($DCountry$), we as well introduce relevant country variables ($CountryVar$) such as one year GDP growth, stock market capitalisation over GDP, Strength of borrower and lender legal rights Index

⁸ What has to be noted is that the use of this dependent variable is not favourable to traditional banks. In fact, total bank assets typically include loans, reserves, security investments and physical assets. Generally, traditional banks with higher credit activity have more branches and, therefore, more physical assets than non traditional banks. This may produce a downward bias on the difference in the loan intensity between traditional and non traditional banks

and Credit depth of information Index (seeTable 1 for details). The introduction of country dummies and indexes is important since it allows to control for country differences in bank models and/or country or macroregional specific institutional characteristics (e.g. country specific differences in banking supervision as well as monetary policy factors). Standard errors are clustered at bank/country level in order to take into account that between variance is larger than within variance.

4.1 Econometric Findings

In the first estimate with size and year and country fixed effects as controls, we find that cooperative banks have a 10 point difference in the loans to total assets ratio *vis-à-vis* the omitted benchmark (commercial banks) on about 29,500 observations (Table 4, column 1). If we include the effect of the investment bank dummy (*DInvestmentBank*) we find that this difference rises to around 32.6 points. The log of the number of employees – $\ln(\text{Size})$ – has a positive and significant effect on the dependent variable.⁹ Year dummies document a downward trend in the dependent variable confirming that a disintermediation process is at work. In the estimation with the share of income from traditional and non traditional activities (Table 4, column 2), we find that the cooperative dummy effect (*DCoop*) remains significant while its magnitude falls to 9 points. The share of income from traditional activities (*ShareTrad*) is highly significant and positive as expected. It is worth noting that cooperative banks have a higher share of traditional activities, but their positive impact on the dependent variable remains significant net of that factor. In the third specification (Table 4, column 3), we add the derivatives to total assets ratio variable (*Deriv/TotAss*) finding a strongly negative and significant effect, while the significance of all other variables remains robust to this introduction.¹⁰ Note that the sample size is reduced to around one fifth of the original sample (and the sample period is *de facto* restricted to 2004-2010) due to the much lower number of banks reporting data on derivatives. As a consequence

⁹ We previously test the nonlinearity of the size effect with two different variables for levels and squares of the number of employees not in logs. We find that both variables are significant and choose this more parsimonious specification that reduces collinearity in the estimates.

¹⁰ Given data limits it is impossible to know the type and use of derivatives considered (*i.e.* hedging, securitisation or proprietary trading). Note as well that the prediction of a negative effect on net loans/total assets ratio arises from both of the last two typologies.

we repeat estimates of columns 1 and 2 with this restricted sample and we observe that our previous findings are robust to this sample change (Table 4, columns 4 and 5).

In Table 5 which follows we test separately whether cooperative banks have significantly lower activity in derivatives than commercial and investment banks finding that this difference is significant (column 1). In terms of magnitude the difference with commercial banks is small (1 percent) while that with investment banks is much larger (around 8 percent).

We then test whether the lower propensity of coop banks to take risk identified in the literature (Hansmann, 1996; Chaddad and Cook, 2004) produces relatively lower earning variability in our sample period. More specifically on this point, we test whether the coop dummy is significant in a panel estimate where the dependent variable is the time series standard deviation of ROA (Table 5, column 2) and ROE (Table 5, column 3), respectively. In order to have a minimum number of observations for calculating the dependent variable we consider three consecutive four-year periods where the dependent variable is calculated on the last three years and regressors in the first year. We then repeat the exercise in two six-year periods (Table 5, column 4 and 5), always leaving the first year for calculating regressors in each period. Our findings show that the *Dcoop* dummy is negative and significant confirming that coop banks have significantly lower standard deviation of ROA (column 4) and ROE (column 5). The economic significance of the effect is remarkable. In the 4-year sample the *Dcoop* effect produces a 40% fall from the average ROA standard deviation in the sample (0.87), while the effect in the 6-year sample is slightly larger (0,42 on a sample average of 0,90). Given that the investment bank dummy is positive and significant in all estimates in Table 5, the distance in terms of ROA and ROE standard deviation between investment banks and coop banks is even larger.

Finally, we argue whether the superior capacity of managing intertemporal risk of cooperative banks (especially during a turbulent period including the years of the financial crisis) contributes to their higher levels of net loans/total assets ratios. In order to do so, we first calculate the time series standard deviation of ROAA (*TimeSD_ROAA*) as a measure of its volatility for each bank in the 1998-

2009 period excluding the last sample year. Second, we re-calculate values of all controls in (1) as mean values for the same time interval. Third, we use the net loans/total assets ratio for the final sample year (2010) as dependent variable. Table 6 presents our findings showing that ROAA volatility correlates negatively and significantly with the net loans/total assets ratio (Table 6, column 1). Given the limits of our data, it is not easy to disentangle direct causality from endogeneity. We are led to presume that the cooperative effect on the net loans/total assets ratio in the period across the financial crisis (and on the net loans/total assets outcome after it) may have worked, among others, through the lower earning volatility channel. To confirm our findings we repeat the exercise by increasing the distance of regressors from the dependent variable year (2010) using 1998-2008, 1998-2007 and 1998-2006 time intervals to calculate *TimeSD_ROAA*, respectively. Results are reported in Table 6 (columns 2-4), The positive correlation between the latter and the dependent variable remains strong and robust.

4.1.1 The coop/non coop difference across the global financial crisis

In order to test whether the difference between cooperative and non cooperative banks is affected by the global financial crisis we propose a diff-in-diff approach where we add to the standard specification in (1) a *DCrisis* dummy which takes value one if the observation year is above 2006 and zero otherwise and the interaction term *DCrisisDcoop* (product between the *Dcrisis* and the *Dcoop* dummy) which captures the diff-in-diff effect.¹¹ Note that if the interaction term has the same (different) sign of the *Dcoop* we are in presence of a divergence (convergence) effect during the financial crisis between the two types of banks. Given that the inclusion of the derivative variable limits the sample only to the last years we cannot estimate our diff-in-diff approach on the specification of Table 5 (column 1) where the derivatives/total assets ratio is the dependent variable.

The diff-in-diff approach in the net loans/total assets ratio specification shows that the *DCrisisDcoop* variable is negative and significant thereby documenting a partial convergence process at work (Table 6a, columns 1-4). In terms of magnitude

¹¹ The subprime crisis starts producing its first effects in 2007. HSBC announces heavy losses in its bond portfolio on February 8, while Northern Rock bank run is on September 14. The peak of the crisis is in September 2008 with the Lehman Brothers event.

the coop/non coop difference is reduced by around one tenth in post financial crisis period. A likely rationale is that the economic downturn following the financial crisis increases the share of non performing loans for these banks which have a relatively higher net loans/total assets ratio forcing them to reduce their lending exposure. This interpretation is supported by the fact that the share of impaired loans on total loans (7.4 against 4.6) and the ratio of impaired loans over equity (70.8 against 30.7 percent) is much higher for coop than for commercial banks in the post-crisis period.

We as well test the impact of the global financial crisis on the coop/non coop difference in earning volatility and find a slight divergence effect in the standard deviation of ROA and ROE, with the relatively lower volatility of coop banks being enhanced in the post-crisis period (Table 6b, columns 1 and 3, column 2 and 4, respectively). These findings support the hypothesis that coop banks perform relatively better in absorbing the financial crisis shock in terms of earning volatility.

4.2 Robustness checks

We perform several robustness checks on our main findings.¹² In order to control for outliers we winsorize our continuous variables around the 1st and 99th centile (and, alternatively, around the 5th and 95th centile). We then test whether the coop difference on the net loans/total assets ratio is valid also for large coops and estimate a specification where only the largest quintile coop banks are included in the sample.¹³ We finally estimate our specifications for high-income countries only. Our main findings on the coop effect on net loans/total assets (Table A1 in the online Appendix) are unchanged in all the above mentioned checks.

We then consider that what measured so far is a mix of between and within effects. Consequently, in order to check for the existence of a separate within effect of cooperative banks on the dependent variable we should introduce fixed effects in

¹² Results are omitted from the main text for reasons of space and available in an online Appendix.

¹³ This check allows us to verify whether vertically integrated coop models such as those in France, the Netherlands and Finland may produce different coop/non coop difference vis-à-vis more dispersed ones such as those in Germany, Austria and Italy.

the model. However, this would make impossible to test jointly the impact of the time invariant cooperative dummy. We address this issue following the Mundlak (1978) approach and we introduce between effects via time averages of the time varying regressors in the estimates. In doing so, we find that all signs and significance discussed above are generally robust (Table A2 in the online Appendix) and in line with what we already found in Table 4. We repeat this check for our findings on the derivatives/total assets ratio and on the standard deviation of ROA and ROE and document the robustness of our results also in this case (Tables A3-A4 in the online Appendix, respectively). In the derivative case we do not perform the crisis and trend tests due to the limited number of time periods. Finally, we test whether findings on the impact of the financial crisis in difference-in-difference estimates are as well robust to all our checks and find that it is the case (Tables A5 and A6 in the online Appendix).

4.3 The Role of the Loan/Asset ratio on Value Added Growth

In this section we aim to test whether a higher net loans/total assets ratio has a positive impact on growth. More specifically, we test this hypothesis by looking at the effect of the net loans/total assets ratio variable on the value added growth of the whole manufacturing sector as well as on different types of industries classified according to (i) their need for external finance, and (ii) their technological intensity. Following Rajan and Zingales (1998) we define the need for external finance of the manufacturing sector as the difference between investment and cash generated from operations. We identify three sub-sectors within the manufacturing sector: “self-financing”, “high financially dependent” and “low financially dependent” sectors based on the original indicators in Rajan and Zingales (1998). These sectors are built using Compustat average data on United States companies between 1980 and 1989. The intervals used to define the degree of financial dependence are $x=0$ for self-financing sectors, $x \leq 0.5$ for low financially dependent sectors, and $x > 0.5$ for high financially dependent sectors.

With respect to technological intensity, we use OECD (2011) classification of ISIC (Revision 3) manufacturing industries based on R&D intensities. Original OECD categories include “high”, “medium high”, “low”, and “medium low”

technology, with cut-off points revealed by R&D relative to value added and gross production statistics.¹⁴ For simplicity, we aggregate the four OECD categories into two groups: high-tech (including high and medium high-tech sectors), and low-tech (including low and medium low-tech sectors).¹⁵

The estimated model is a standard conditional convergence model (see Mankiw et al., 1992 among others and Durlauf et al. (2005) for a survey) in which the change in value added over a given time period (two years in our case) is regressed on its level at time zero, and on conditional convergence factors identified in gross physical capital investment, human capital, and government expenditure. The net loans/total assets ratio is added to such factors with year effects being also included. More specifically we estimate:

$$\begin{aligned} \ln(Y)_{ijt} - \ln(Y)_{ijt-k} = & \alpha_0 + \alpha_1 \ln(Y)_{ijt-k} + \alpha_2 \ln(HumanCap)_{ijt-k} + \alpha_3 \ln(Inv)_{ijt-k} + \\ & + \alpha_4 \ln(GovExp)_{ijt-k} + \alpha_5 \ln(NetLoan/TotAss)_{ijt-k} + \\ & + \sum_j \beta_j DCountry_j + \sum_t \gamma_t DYear_t + \varepsilon_{ijt} \end{aligned} \quad (2)$$

where the dependent variable is the two-year rate of growth (*i.e.* two-year log difference) of value added of the Y_{ijt} , that is, the average value added of a selected group of industries (among the six defined groups of all manufacturing industries, low tech, high tech, high financially dependent, low financially dependent, self-financing). Following the standard conditional convergence approach (see Mankiw *et al.*, 1992) basic regressors include the log of the initial period value of the average value added of the industry group – $\ln(Y)_{ijt-k}$ –, which is expected to have negative sign if conditional convergence is at work, the log of the initial level of human capital – $\ln(HumanCap)_{ijt-k}$ – and physical capital investment – $\ln(Inv)_{ijt-k}$ –, the log of the initial level of government expenditure – $\ln(GovExp)_{ijt-k}$ –, and the log of the initial value of the net loans/total assets ratio – $\ln(NetLoan/TotAss)_{ijt-k}$ – for the i -th bank of the j -th country. Country ($DCountry$) and time ($DTime$) dummies as well as Mundlak variables (*i.e.* country time averages of the time varying variables)

¹⁴ For additional details see <http://www.oecd.org/science/inno/48350231.pdf>.

¹⁵ Appendix 1 provides detailed information about the sectors and relative ISIC codes included in the different categories of the two classifications (*i.e.* need of external finance, and technological intensity).

complete the set of regressors included in the estimates. The equation is estimated separately (Table 7, columns 1-6) and, in a later step, simultaneously within a two-equation system which includes the Mundlak augmented version of (1) (Table 8, columns 1-6).¹⁶

In the single equation estimate our results document that the loan intensity has a significant and positive within effect on the value added growth of the manufacturing industry on the whole, with the exception of self-financing sectors and sectors in high need of external finance. This last finding is confirmed in the two-equation system in Table 8. While the interpretation of the lack of impact on self-financing sectors is intuitive, that on sectors in high need of external finance implies that in such cases bank financing is not sufficient and other sources (such as equity financing, corporate bond issues, venture capital, etc.) become important.

Among other controls the two main factors of conditional convergence (*i.e.* physical and human capital) are significant with the expected positive sign, while the initial period level of the dependent variable is negative and significant documenting that the hypothesis of conditional convergence within each group is not rejected.

5. Conclusions

The nexus between finance and growth is one of the oldest and most explored in the economic literature. However, the recent transformations of the global economy and the occurrence of the global financial crisis seem to have caused an important discontinuity in the empirical evidence on this relationship. Many authors have recently questioned the traditional robust and well-established positive link between the two variables. We argue that one of the explanatory factors is that the growing opportunities of purely financial activities and the increasing competition and falling profit margins in the traditional segment of credit, led profit maximizing banks to reduce their exposure in the first field of activity and to increase it in the second. We claim that, however, this should not be

¹⁶ Unfortunately we cannot use our time series variables of ROAA earning volatility in these value added growth estimates since it would be impossible to perform a panel estimate. We therefore measure indirectly their impact through the net loans/total assets variable in the value added one-equation estimate, and through the cooperative dummy effect on the net loans/total assets ratio in the simultaneous two-equation estimate.

the case for cooperative banks if they stick to their multistakeholder principles and statutory rules, which are much more oriented towards traditional credit. Given the above, we try to empirically test whether the widespread opinion that more loans may support real economy growth finds confirmation in the reality.

Our findings confirm some but not all of the above propositions. Cooperative banks display, as expected, higher loans/total assets ratios than non-cooperative banks throughout the whole period under inquiry. They also have higher share of income from lending activity *vis-à-vis* services and derivative trading. In addition to that, cooperative banks exhibit a significantly lower earning volatility, which contributes to higher end of period net loans/total assets ratios. However, their difference in terms of loan intensity does not increase (actually tightens a bit) during the global financial crisis and slowly converges to that of non coop banks in the overall sample period.

We also find that, in our sample, a higher net loans/total assets ratio (which is a characteristic of cooperative banks) is positively correlated with the value added growth of the manufacturing sector with the exception of the two extremes of self-financing sectors and sectors in high need of external finance. This last mixed finding seems to support the hypothesis that a traditional banking channel, with high intensity of the traditional intermediation activity, is important for some industries, but not for others where internal financing sources or financing channels different from bank loans may presumably play an important role.

From a more general perspective our findings confirm that diversity in the financial system is important and must be carefully preserved by regulators. Different types of banks exist and, in particular, the specificity of cooperative banks has relevant distinctive features and contributes to value added growth in some (but not all) industries.

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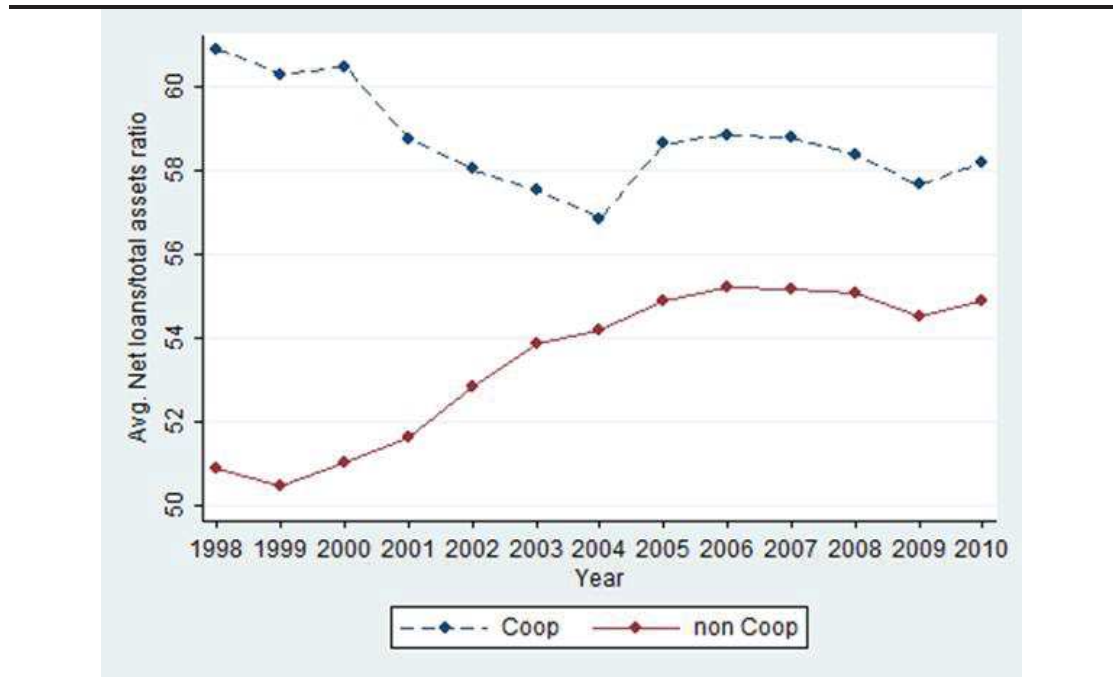
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Figure

Figure 1. Time dynamics of the Net loans/total assets ratio for cooperative and non-cooperative banks



Legend. *y-axis* variable: **Avg. Net loans/total assets ratio** is the 1998-2010 sample average of the Net loans/total assets ratio for cooperative and non-cooperative banks.
x-axis variable: **Year**.

Tables

Table 1. Variables' definition, source, and level

Variable	Definition	Source	Level
<i>NetLoan/TotAss</i>	Net loans/total assets (%)	Bankscope	Bank
<i>Deriv/TotAss</i>	Derivatives/total assets (%)	Bankscope	Bank
<i>ShareTrad</i>	Income share from traditional activities (%) ^a	Bankscope	Bank
<i>ShareNonTrad</i>	Income share from non traditional activities (%) ^b	Bankscope	Bank
<i>Tier1Ratio</i>	Tier 1 capital ratio (%) ^c	Bankscope	Bank
<i>ImpLoan/GrossLoan</i>	Impaired loans/gross loans (%)	Bankscope	Bank
<i>LoanRes/ImpLoan</i>	Loan loss reserves/impaired loans (%)	Bankscope	Bank
<i>Size</i>	Number of employees	Bankscope	Bank
<i>Dcoop</i>	Dummy for cooperative bank (1=yes, 0=no)	Bankscope	Bank
<i>ROAA</i>	Return on average assets (%)	Bankscope	Bank
<i>ROAE</i>	Return on average equity (%)	Bankscope	Bank
<i>TimeSD_ROAA</i>	Time series standard deviation of ROAA	Bankscope	Bank
<i>TimeSD_ROAE</i>	Time series standard deviation of ROAE	Bankscope	Bank
<i>Y(TotMan)</i>	Total value added manufacturing sector (constant 2005 mil US\$)	INDSTAT4	Country
<i>Y(LowTech)</i>	Value added low-tech sectors (constant 2005 mil US\$)	INDSTAT4	Country
<i>Y(HighTech)</i>	Value added high-tech sectors (constant 2005 mil US\$)	INDSTAT4	Country
<i>Y(LowExtFin)</i>	Value added low-financial dependence sectors (constant 2005 mil US\$)	INDSTAT4	Country
<i>Y(HighExtFin)</i>	Value added high-financial dependence sectors (constant 2005 mil US\$)	INDSTAT4	Country
<i>Y(SelfFin)</i>	Value added self-financing sectors (constant 2005 mil US\$)	INDSTAT4	Country
<i>LoanLegalRights</i>	Strength of legal rights index measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitate lending. The index ranges from 0 to 12, with higher scores indicating that these laws are better designed to expand access to credit.	WDI	Country
<i>CreditDepth</i>	Depth of credit information index measures rules affecting the scope, accessibility, and quality of credit information available through public or private credit registries. The index ranges from 0 to 8, with higher values indicating the availability of more credit information, from either a public registry or a private bureau, to facilitate lending decisions.	WDI	Country

Table 2 (con't). Variables' definition, source, and level

Variable	Definition	Source	Level
<i>GDPgrowth</i>	One-year GDP growth	WDI	Country
<i>Govexp</i>	General government final consumption expenditure (% of GDP)	WDI	Country
<i>Humancap</i>	School enrollment, secondary (% gross)	WDI	Country
<i>Inv</i>	Gross fixed capital formation (% of GDP)	WDI	Country

^a The income share from traditional activity is defined as the ratio between income from credit and income from all of the three main bank activities, namely loans, services and derivatives trading.

^b The income share from non traditional activity is defined as the ratio between income from trading and derivatives and income from all of the three main bank activities, namely loans, services and derivatives trading.

^c TheTier1Ratio is is a metric used to measure the financial health of a bank by comparing its core equity capital (*i.e.* the Tier 1 capital) and total risk-weighted assets (*i.e.* all assets held by the bank that are systematically weighted for credit risk).

^d A cooperative bank is defined small if its number of employees is lower than the cooperative banks' sample median (*i.e.* 113).

Table 3. Country breakdown, frequency and percentage for banks

Country	Freq.	Percent	Country	Freq.	Percent
<i>Austria</i>	5,226	3.72	<i>Japan</i>	13,468	9.57
<i>Belgium</i>	2,236	1.59	<i>Republic of Korea</i>	1,664	1.18
<i>Brazil</i>	3,653	2.6	<i>Luxembourg</i>	2,535	1.8
<i>Canada</i>	1,989	1.41	<i>Malaysia</i>	1,885	1.34
<i>Czech Republic</i>	806	0.57	<i>Mexico</i>	2,132	1.52
<i>Denmark</i>	2,223	1.58	<i>Netherlands</i>	1,989	1.41
<i>Finland</i>	507	0.36	<i>Poland</i>	1,183	0.84
<i>France</i>	10,062	7.15	<i>Portugal</i>	1,001	0.71
<i>Germany</i>	36,270	25.79	<i>Saudi Arabia</i>	273	0.19
<i>Greece</i>	533	0.38	<i>Singapore</i>	1,456	1.04
<i>Hong Kong</i>	2,587	1.84	<i>South Africa</i>	1,404	1
<i>Hungary</i>	884	0.63	<i>Spain</i>	4,108	2.92
<i>India</i>	1,781	1.27	<i>Sweden</i>	2,132	1.52
<i>Indonesia</i>	1,846	1.31	<i>Switzerland</i>	9,386	6.67
<i>Ireland</i>	1,339	0.95	<i>Thailand</i>	988	0.7
<i>Italy</i>	13,884	9.87	<i>United Kingdom</i>	9,230	6.56

Legend: Freq. is the number of banks in each country for the entire sample period 1998-2010; Percent is the relative percentage of banks i in country j for the entire sample period 1998-2010.

Table 4. Descriptive statistics for cooperative and non-cooperative banks

	Coop						non Coop						t-stat* (p-value)
	Obs	Mean	Std. Dev.	Median	Min	Max	Obs	Mean	Std. Dev.	Median	Min	Max	
NetLoan/TotAss	25,493	58.763	14.304	60.2	0.01	98.02	43,405	53.616	27.890	58.89	-20.75	100	-27.421 (0.000)
Deriv/TotAss	3,070	0.003	0.011	0.0005	-0.0005	0.241	7,765	0.032	0.083	0.006	-0.003	0.944	19.439 (0.000)
ShareTrad	25,418	0.837	0.112	0.823	0	1	45,686	0.729	0.274	0.815	0	1	-60.442 (0.000)
ShareNonTrad	25,418	0.006	0.025	0	0	0.584	45,686	0.064	0.164	0	0	1	56.043 (0.000)
Tier1Ratio	3,681	16.737	14.328	13.93	0.09	505	11,199	18.615	39.766	11.04	-176.06	962.18	2.806 (0.005)
ImpLoan/GrossLoan	8,177	8.568	5.620	7.58	0	55.28	13,867	6.080	15.920	3.15	-178.26	814.55	-13.643 (0.000)
LoanRes/ImpLoan	8,133	42.362	49.392	32.14	0	979.39	13,581	92.741	111.316	62.11	-753.67	998.7	38.602 (0.000)
Size	20,417	318	2,402	113	0	127,402	29,214	1,734	9,723	179	0	331,458	20.369 (0.000)
ROAA	25,475	0.249	1.34	0.25	-45	121.54	46,131	0.95	6.504	0.4	-215.24	223.08	16.99 (0.000)
ROAE	25,457	3.349	18.462	4.28	-933.33	581.82	46,046	7.281	34.138	6.155	-975.36	997.05	17.053 (0.000)
TimeSD_ROAA	3,116	0.47	1.825	0.198	0	69.943	6,253	2.106	6.307	0.456	0	204.824	14.188 (0.000)
TimeSD_ROAE	3,112	7.806	25.836	2.607	0	662.043	6,239	13.306	32.013	4.934	0	637.252	8.327 (0.000)

Legend: for variables definition see **Table 1**.

*95 percent significance of the difference in means (mean value for non-cooperative banks – mean value for cooperative banks).

Table 5. The determinants of the Net loans/total assets ratio

VARIABLES	(1)	(2)	(3)	(4)	(5)
Dcoop	10.004*** (0.986)	9.045*** (0.953)	9.785*** (1.619)	11.583*** (1.710)	10.222*** (1.650)
Ln(Size)	1.340*** (0.244)	1.460*** (0.229)	1.460*** (0.338)	1.215*** (0.349)	1.291*** (0.339)
ShareTrad		9.519*** (1.385)	12.888*** (2.418)		12.194*** (2.481)
ShareNonTrad		0.726 (2.139)	1.713 (2.838)		-0.624 (2.904)
Deriv/TotAss			-41.931*** (6.289)		
DInvestmentBank	-22.579*** (2.048)	-19.856*** (2.060)	-15.632*** (3.215)	-21.677*** (3.214)	-18.443*** (3.242)
Constant	-10.324 (10.882)	-18.399* (10.682)	43.026** (20.756)	50.712** (21.603)	40.953* (20.948)
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Observations	29,504	29,504	6,388	6,388	6,388
Number of index	6,110	6,110	1,939	1,939	1,939

Legend: Country Fixed Effects: country dummies; Year Fixed Effects: year dummies. *DInvestmentBank*: (0/1) dummy for investment banks. For definitions of other variables see Table (1). (1): panel specification of equation (1) with year and country dummies and only bank size included as control; (2) panel specification of equation (1) with year and country dummies and bank size, share of income from traditional and non traditional activities included as control; (3) panel specification of equation (1) with year and country dummies and bank size, share of income from traditional and non traditional activities, and derivatives to total assets ratio included as control; (4) specification (1) limited to the restricted sample of bank-years for which data on derivatives are available; (5) specification (2) limited to the restricted sample of bank-years for which data on derivatives are available. Robust Standard Errors in round brackets. *** p<0.01, ** p<0.05, * p<0.1.

Table 5. The determinants of Derivatives/total assets ratio, ROA and ROE standard deviation

VARIABLES	(1) Derivative s/ Total Assets	(2) ROA Standard Deviation (4y panel)	(3) ROE Standard Deviation (4y panel)	(4) ROA Standard Deviation (6y panel)	(5) ROE Standard Deviation (6y panel)
Dcoop	-0.013*** (0.004)	-0.351*** (0.079)	-2.068*** (0.498)	-0.420*** (0.081)	-2.477*** (0.552)
Ln(Size)	0.003*** (0.001)	-0.081*** (0.022)	0.213 (0.141)	-0.117** (0.058)	0.288* (0.174)
DInvestmentBank	0.078*** (0.017)	1.078*** (0.269)	6.216* (3.396)	1.203*** (0.367)	12.536** (5.722)
Constant	0.031 (0.053)	2.308*** (0.672)	12.470** (5.528)	0.582 (1.176)	-14.217* (8.113)
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Observations	6,488	9,034	9,032	5,082	5,080
Number of index	1,975	5,107	5,107	3,609	3,607

Legend: Country Fixed Effects: country dummies; Year Fixed Effects: year dummies. *DInvestmentBank*: (0/1) dummy for investment banks. For definitions of other variables see Table (1). Robust Standard Errors in round brackets. *** p<0.01, ** p<0.05, * p<0.1.

Table 6. The effect of intertemporal risk on Net loans/total assets ratio

VARIABLES	(1)	(2)	(3)	(4)
	1998-2009	1998-2008	1998-2007	1998-2006
Dcoop	0.004 (1.319)	12.552*** (1.425)	12.585*** (1.513)	12.419*** (1.662)
DcoopSmall	-11.252*** (2.246)	-4.825 (3.965)	-8.239* (4.255)	-1.958 (4.529)
Ln(Size)	0.338 (0.329)	1.097*** (0.366)	0.659 (0.432)	0.866* (0.512)
ShareTrad	3.179 (4.582)	29.138*** (4.727)	27.405*** (5.022)	23.741*** (5.881)
ShareNonTrad	-46.814*** (8.321)	-28.393*** (9.063)	-35.462*** (11.391)	-31.918** (14.243)
Deriv/TotAss	-69.063*** (13.240)	-74.530*** (15.719)	-76.568*** (20.390)	-100.501*** (21.992)
TimeSD_ROAA	-1.682*** (0.352)	-1.200*** (0.288)	-0.982*** (0.306)	-0.666** (0.271)
Constant	58.918*** (4.886)	34.008*** (5.032)	38.764*** (5.274)	40.967*** (6.037)
Observations	1,690	1,158	971	769

Legend: For variables definition see Table (1). *** p<0.01, ** p<0.05, * p<0.1
Robust Standard Errors in round brackets.

Table 6a Difference-in-difference estimates on the impact of the global financial crisis on the coop/non coop difference (*dependent variable*: net loans/total assets)

VARIABLES	(1)	(2)	(3)	(4)
Dcoop	10.701*** (0.989)	9.694*** (0.960)	10.573*** (0.970)	5.090*** (0.888)
Dcrisis	-0.072 (0.385)	-0.053 (0.384)	-0.087 (0.391)	-0.040 (0.389)
DcoopDcrisis	-1.185*** (0.229)	-1.080*** (0.229)	-1.180*** (0.231)	-1.128*** (0.230)
Ln(Size)	1.306*** (0.244)	1.431*** (0.230)	1.415*** (0.505)	1.500*** (0.504)
ShareTrad		9.356*** (1.386)		5.194*** (1.539)
ShareNonTrad		0.567 (2.131)		2.602 (2.239)
Deriv/TotAss				
Constant	-11.432 (10.775)	-19.298* (10.569)	-10.970 (10.671)	-41.974*** (10.586)
Observations	29,504	29,504	29,504	29,504
Number of index	6,110	6,110	6,110	6,110

Legend: Country Fixed Effects: country dummies; Year Fixed Effects: year dummies. Additional regressors: *Dcrisis*: (0/1) dummy taking value 1 after 2006; *DcoopDcrisis*: product between the *Dcrisis* and the *Dcoop* dummy. For definitions of other variables see Table (1). Robust standard errors in round brackets. *** p<0.01, ** p<0.05, * p<0.1.

Table 6b Difference-in-difference estimates on the impact of the global financial crisis on the coop/non coop difference (*dependent variables*: standard deviation of ROA and ROE)

VARIABLES	(1)	(2)	(3)	(4)
Dcoop	-0.323*** (0.082)	-2.116*** (0.542)	-0.435*** (0.095)	-2.025*** (0.767)
Dcrisis	0.077 (0.069)	0.886 (0.571)	0.027 (0.136)	-1.776** (0.872)
DcoopDcrisis	-0.066* (0.036)	-0.149 (0.422)	-0.096** (0.047)	-0.828 (0.562)
Ln(Size)	-0.047 (0.089)	0.966 (0.764)	0.198* (0.103)	3.302*** (0.992)
Constant	2.082*** (0.710)	9.205 (6.149)	0.852 (1.330)	-6.519 (8.559)
Country Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	9,034	9,032	5,082	5,080
Number of index	5,107	5,107	3,609	3,607

Legend: Country Fixed Effects: country dummies; Year Fixed Effects: year dummies; for variables definition see Table (1). Additional regressors: *Dcrisis*: (0/1) dummy taking value 1 after 2007; *DcoopDcrisis*: product between the *Dcrisis* and the *Dcoop* dummy. Dependent variable: (1) standard deviation of ROA 4-year panel; (2) standard deviation of ROE 4-year panel; (3) standard deviation of ROA 6-year panel; (4) standard deviation of ROE 6-year panel. Robust standard errors in round brackets. *** p<0.01, ** p<0.05, * p<0.1.

Table 7. The determinants of Value added growth (controlling for Mundlak between effects)

VARIABLES	(1) ΔY (TotMan)	(2) ΔY (LowTech)	(3) ΔY (HigTech)	(4) ΔY (LowExtFin)	(5) ΔY (HigExtFin)	(6) ΔY (SelfFin)
$\ln(\text{Humancap})_{t-2}$	0.552*** (0.020)	0.482*** (0.021)	0.702*** (0.020)	0.639*** (0.024)	0.527*** (0.029)	-1.301*** (0.057)
$\ln(\text{Inv})_{t-2}$	0.314*** (0.017)	0.516*** (0.020)	0.289*** (0.016)	0.410*** (0.021)	0.205*** (0.023)	0.820*** (0.045)
$\ln(\text{Govexp})_{t-2}$	-1.501*** (0.026)	-1.695*** (0.027)	-1.428*** (0.026)	-1.865*** (0.031)	-2.542*** (0.036)	-2.564*** (0.072)
$\ln(\text{NetLoan/TotAss})_{t-2}$	0.001*** (0.000)	0.000*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.000 (0.000)	-0.000 (0.000)
$E_t[(\text{Humancap})]$	-0.086*** (0.002)	-0.137*** (0.002)	-0.058*** (0.001)	-0.102*** (0.002)	-0.156*** (0.003)	-0.242*** (0.005)
$E_t[(\text{Inv})]$	0.101*** (0.003)	0.182*** (0.003)	0.042*** (0.002)	0.126*** (0.003)	0.259*** (0.004)	0.422*** (0.009)
$E_t[(\text{Govexp})]$	0.252*** (0.005)	0.379*** (0.005)	0.176*** (0.004)	0.296*** (0.005)	0.532*** (0.007)	0.669*** (0.012)
$E_t[(\text{NetLoan/TotAss})]$	-0.001*** (0.000)	-0.000*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.000** (0.000)	0.000 (0.000)
$\ln(Y(\text{TotMan}))_{t-2}$	-0.441*** (0.008)					
$\ln(Y(\text{LowTech}))_{t-2}$		-0.558*** (0.008)				
$\ln(Y(\text{HigTech}))_{t-2}$			-0.402*** (0.007)			
$\ln(Y(\text{LowExtFin}))_{t-2}$				-0.481*** (0.008)		
$\ln(Y(\text{HigExtFin}))_{t-2}$					-0.496*** (0.008)	
$\ln(Y(\text{SelfFin}))_{t-2}$						-0.947*** (0.011)
Constant	16.824*** (0.323)	21.868*** (0.315)	14.010*** (0.311)	18.518*** (0.312)	19.929*** (0.371)	41.226** (0.529)
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	23,365	23,365	23,365	23,365	23,329	23,190
Number of banks	8,075	8,075	8,075	8,075	8,069	8,006

Legend: $\Delta Y(\text{TotMan})$: two-year rate of growth of value added of total manufacturing sector; $\Delta Y(\text{LowTech})$: two-year rate of growth of value added of low-tech sectors (see Appendix I); $\Delta Y(\text{HigTech})$: two-year rate of growth of value added of high-tech sectors (see Appendix I); $\Delta Y(\text{LowExtFin})$: two-year rate of growth of value added of low external financial dependence sectors (see Appendix I); $\Delta Y(\text{HigExtFin})$: two-year rate of growth of value added of high external financial dependence sectors (see Appendix I); $\Delta Y(\text{SelfFin})$: two-year rate of growth of value added of self-financing sectors (see Appendix I). **Country Fixed Effects**: country dummies; **Year Fixed Effects**: year dummies; for the definition of other variables see Table (1). $E_t[.]$: time average of the time varying regressor (Mundlak, 1978). **t-2**: initial level of the time varying regressor. **(1)**: panel specification estimate of equation (2) for total manufacturing sector; **(2)** panel specification of equation (2) limited to the subsample of low-tech sectors; **(3)** panel specification of equation (2) limited to the subsample of high-tech sectors; **(4)** panel specification of equation (2) limited to the subsample of low external financial dependence sectors; **(5)** panel specification of equation (2) limited to the subsample of high external

financial dependence sectors; **(6)** panel specification of equation (2) limited to the subsample of self-financing sectors. Robust Standard Errors in round brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 8. The determinants of Value added growth (controlling for Mundlak between effects – two-equation system)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	NetLoan/ TotAss _{t-2}	NetLoan/ TotAss _{t-2}	NetLoan/ TotAss _{t-2}	NetLoan/ TotAss _{t-2}	NetLoan/ TotAss _{t-2}	NetLoan/ TotAss _{t-2}
Dcoop	2.981*** (0.368)	2.981*** (0.368)	2.981*** (0.368)	2.981*** (0.368)	2.986*** (0.368)	2.942*** (0.368)
ln(Size) _{t-2}	2.172*** (0.100)	2.172*** (0.100)	2.172*** (0.100)	2.172*** (0.100)	2.182*** (0.100)	2.154*** (0.100)
ShareTrad _{t-2}	40.351*** (0.936)	40.354*** (0.936)	40.352*** (0.936)	40.352*** (0.936)	40.406*** (0.937)	40.538*** (0.945)
ShareNonTrad _{t-2}	-23.469*** (1.824)	-23.462*** (1.824)	-23.473*** (1.824)	-23.467*** (1.824)	-23.477*** (1.825)	-23.230*** (1.827)
Constant	6.916 (8.070)	6.914 (8.070)	6.919 (8.070)	6.915 (8.070)	16.995** (8.007)	17.058** (8.001)
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	15,641	15,641	15,641	15,641	15,635	15,566
R-squared	0.289	0.289	0.289	0.289	0.289	0.287

(continues next page)

Legend: **(1):** panel specification estimate of the Mundlak augmented version of equation (2) via two-equation system for total manufacturing sector; **(2):** panel specification estimate of the Mundlak augmented version of equation (2) via two-equation system limited to the subsample of low-tech sectors; **(3):** panel specification estimate of the Mundlak augmented version of equation (2) via two-equation system limited to the subsample of high-tech sectors; **(4):** panel specification estimate of the Mundlak augmented version of equation (2) via two-equation system limited to the subsample of low external financial dependence sectors; **(5):** panel specification estimate of the Mundlak augmented version of equation (2) via two-equation system limited to the subsample of high external financial dependence sectors; **(6):** panel specification estimate of the Mundlak augmented version of equation (2) via two-equation system limited to the subsample of self-financing sectors. **(1a) to (6a)** are first stage estimates of the two-equation systems of **(1) to (6)** as described above. **Country Fixed Effects:** country dummies; **Year Fixed Effects:** year dummies; for the definition of other variables see Table (1). **t-2:** initial level of the time varying regressor. Robust Standard Errors in round brackets. *** p<0.01, ** p<0.05, * p<0.1.

Table 8 (con't). The determinants of Value added growth (controlling for Mundlak between effects – two-equation system)

VARIABLES	(1) ΔY (TotMan)	(2) ΔY (LowTech)	(3) ΔY (HigTech)	(4) ΔY (LowExtFin)	(5) ΔY (HigExtFin)	(6) ΔY (SelfFin)
$\ln(\text{Humancap})_{t-2}$	0.499*** (0.019)	0.394*** (0.020)	0.637*** (0.020)	0.661*** (0.025)	0.442*** (0.036)	-2.508*** (0.072)
$\ln(\text{Inv})_{t-2}$	0.492*** (0.020)	0.618*** (0.022)	0.538*** (0.020)	0.622*** (0.027)	0.425*** (0.035)	1.044*** (0.068)
$\ln(\text{Govexp})_{t-2}$	-1.659*** (0.028)	-1.751*** (0.028)	-1.678*** (0.029)	-2.122*** (0.035)	-2.759*** (0.049)	-2.490*** (0.096)
$\ln(\text{NetLoan/TotAss})_{t-2}$	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.000 (0.000)	-0.000 (0.000)
$E_t[(\text{Humancap})]$	0.055*** (0.001)	0.067*** (0.001)	0.042*** (0.001)	0.056*** (0.001)	-0.036*** (0.002)	0.204*** (0.004)
$E_t[(\text{Inv})]$	0.234*** (0.004)	0.271*** (0.004)	0.174*** (0.004)	0.230*** (0.005)	0.269*** (0.006)	0.652*** (0.012)
$E_t[(\text{Govexp})]$	0.250*** (0.006)	0.260*** (0.006)	0.278*** (0.006)	0.277*** (0.007)	0.949*** (0.021)	0.416*** (0.016)
$E_t[(\text{NetLoan/TotAss})]$	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.000* (0.000)	0.000 (0.000)
$\ln(Y(\text{TotMan}))_{t-2}$	-0.543*** (0.008)					
$\ln(Y(\text{LowTech}))_{t-2}$		-0.622*** (0.008)				
$\ln(Y(\text{HigTech}))_{t-2}$			-0.506*** (0.008)			
$\ln(Y(\text{LowExtFin}))_{t-2}$				-0.567*** (0.009)		
$\ln(Y(\text{HigExtFin}))_{t-2}$					-0.519*** (0.010)	
$\ln(Y(\text{SelfFin}))_{t-2}$						-0.880*** (0.014)
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	15,641	15,641	15,641	15,641	15,635	15,566
R-squared	0.875	0.852	0.883	0.821	0.741	0.462

Legend: (1): panel specification estimate of the Mundlak augmented version of equation (2) via two-equation system for total manufacturing sector; (2): panel specification estimate of the Mundlak augmented version of equation (2) via two-equation system limited to the subsample of low-tech sectors; (3): panel specification estimate of the Mundlak augmented version of equation (2) via two-equation system limited to the subsample of high-tech sectors; (4): panel specification estimate of the Mundlak augmented version of equation (2) via two-equation system limited to the subsample of low external financial dependence sectors; (5): panel specification estimate of the Mundlak augmented version of equation (2) via two-equation system limited to the subsample of high external financial dependence sectors; (6): panel specification estimate of the Mundlak augmented version of equation (2) via two-equation system limited to the subsample of self-financing sectors. (1b) to (6b) are second stage estimates of the two-equation systems of (1) to (6) as described above. $\Delta Y(\text{TotMan})$: two-year rate of growth of value added of total manufacturing sector; $\Delta Y(\text{LowTech})$: two-year rate of growth of value added of low-tech sectors (see Appendix I); $\Delta Y(\text{HigTech})$: two-year rate of growth of value added of high-tech sectors (see Appendix I); $\Delta Y(\text{LowExtFin})$: two-year rate of growth of value added of low external financial dependence sectors (see Appendix I); $\Delta Y(\text{HigExtFin})$: two-year rate of growth of value added of high external financial dependence sectors (see Appendix I); $\Delta Y(\text{SelfFin})$: two-year rate of growth of value added of self-financing sectors (see Appendix I). **Country Fixed Effects**: country dummies; **Year Fixed Effects**: year dummies; for the definition of other variables see Table (1). $E_t[.]$: time average of the time varying regressor (Mundlak, 1978). $t-2$: initial level of the time varying regressor. Robust Standard Errors in round brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Appendix I

Classification of industrial sectors according to their need for external finance (Rajan and Zingales, 1998)

Low financially dependent sectors	ISIC CODE	High financially dependent sectors	ISIC CODE	Self-financing sectors	ISIC CODE
Processed meat, fish, fruit, vegetables, fats	151	Other chemicals	242	Spinning, weaving and finishing of text	171
Grain mill products; starches; animal feeds	153	Plastic products	2520	Tanning, dressing and processing of leather	191
Beverages	155	Glass and glass products	2610	Tobacco products	1600
Other textiles	172	Office, accounting and computing machinery	3000	Footwear	1920
Products of wood, cork, straw, etc.	202	Electric motors, generators and transformers	3110		
Paper and paper products	210	Electricity distribution & control apparatus	3120		
Publishing	221	TV/radio transmitters; line comm. Apparatus	3220		
Printing and related service activities	222	TV and radio receivers and associated goods	3230		
Basic chemicals	241				
Rubber products	251				
Non-metallic mineral products n.e.c.	269				
Casting of metals	273				
Struct. metal products; tanks; steam generators	281				
Other metal products; metal working services	289				
Transport equipment n.e.c.	359				
Wearing apparel, except fur apparel	1810				
Dressing & dyeing of fur; processing of fur	1820				
Refined petroleum products	2320				
Basic iron and steel	2710				
Basic precious and non-ferrous metals	2720				
Furniture	3610				

Classification of industrial sectors according to their technological intensity (OECD, 2011)

Low and medium-low tech	ISIC CODE	High and medium-high tech	ISIC CODE
Processed meat, fish, fruit, vegetables, fats	151	Basic chemicals	241
Grain mill products; starches; animal feeds	153	Other chemicals	242
Other food products	154	General purpose machinery	291
Beverages	155	Special purpose machinery	292
Spinning, weaving and finishing of textiles	171	Medical, measuring, testing appliances, etc.	331
Other textiles	172	Transport equipment n.e.c.	359
Tanning, dressing and processing of leather	191	Man-made fibres	2430
Products of wood, cork, straw, etc.	202	Domestic appliances n.e.c.	2930
Publishing	221	Office, accounting and computing machinery	3000
Printing and related service activities	222	Electric motors, generators and transformers	3110
Rubber products	251	Electricity distribution & control apparatus	3120
Non-metallic mineral products n.e.c.	269	Insulated wire and cable	3130
Casting of metals	273	Accumulators, primary cells and batteries	3140
Struct.metal products; tanks; steam generators	281	Lighting equipment and electric lamps	3150
Other metal products; metal working services	289	Other electrical equipment n.e.c.	3190
Building and repairing of ships and boats	351	Electronic valves, tubes, etc.	3210
Manufacturing n.e.c.	369	TV/radio transmitters; line comm. Apparatus	3220
Dairy products	1520	TV and radio receivers and associated goods	3230
Tobacco products	1600	Optical instruments & photographic equipment	3320
Knitted and crocheted fabrics and articles	1730	Watches and clocks	3330
Footwear	1920	Motor vehicles	3410
Sawmilling and planing of wood	2010	Automobile bodies, trailers & semi-trailers	3420
Reproduction of recorded media	2230	Parts/accessories for automobiles	3430
Coke oven products	2310	Railway/tramway locomotives & rolling stock	3520
Refined petroleum products	2320	Aircraft and spacecraft	3530
Processing of nuclear fuel	2330		
Plastic products	2520		
Glass and glass products	2610		
Basic iron and steel	2710		
Basic precious and non-ferrous metals	2720		
Furniture	3610		
Recycling of metal waste and scrap	3710		
Recycling of non-metal waste and scrap	3720		

Online Appendix

Table A.1 Robustness checks on the cooperative bank impact on net loans over total assets

VARIABLES	(1)	(2)	(3)	(4)	(5)
(a) Dcoop	13.616*** (1.177)	12.461*** (1.158)	7.453*** (2.779)	9.500*** (2.767)	6.667** (2.801)
(a) DcoopTrend	-0.356*** (0.097)	-0.336*** (0.098)	0.209 (0.271)	0.187 (0.261)	0.318* (0.134)
(b) DcoopWinsorized 1-99	8.588*** (0.858)	7.616*** (0.850)	7.733*** (1.427)	9.372*** (1.466)	8.154*** (1.419)
(c) DcoopWinsorized 5-95	8.510*** (0.828)	7.575*** (0.819)	8.029*** (1.392)	9.621*** (1.434)	8.430*** (1.384)
(d) DcoopLargestQuintile	8.062*** (1.024)	7.233*** (0.993)	10.335*** (1.747)	11.776*** (1.835)	10.845*** (1.776)
(e) DcoopHighIncome	9.774*** (1.018)	8.932*** (0.988)	9.926*** (1.693)	11.634*** (1.779)	10.318*** (1.725)

Legend: The table reports the value of the Dcoop variables in estimates where: (rows a) a DcoopTrend variable (Dcoop multiplied by linear time trend) has been added; (row b) continuous variables have been winsorized on 1st and 99th centile values; (row c) continuous variables have been winsorized on 5th and 95th centile values; (row d) only coop banks belonging to the largest size quintile have been included; (row e) only high income countries have been included. Specifications (1)-(5) are the corresponding ones from Table 4.

Table A.2 Robustness checks on the cooperative bank impact on net loans over total assets (Mundlak correction)

VARIABLES	(1)	(2)	(3)	(4)	(5)
(a) Dcoop	13.797*** (1.172)	8.240*** (1.111)	6.910*** (1.513)	11.769*** (1.653)	6.956*** (1.538)
(b) Dcoop	13.482*** (1.176)	7.944*** (1.113)	5.174* (2.664)	9.665*** (2.699)	4.341 (2.689)
(b) Dcooptrend	-0.355*** (0.066)	-0.347*** (0.066)	0.156 (0.192)	0.188 (0.187)	0.236 (0.194)
(c) DcoopWinsorized 1-99	9.547*** (0.874)	6.069*** (0.845)	5.964*** (0.843)	9.547*** (0.874)	6.069*** (0.845)
(d) Dcoop Winsorized 5-95	9.564*** (0.849)	6.220*** (0.816)	6.174*** (0.815)	9.564*** (0.849)	6.220*** (0.816)
(e) DcoopLargestQuintile	8.070*** (1.023)	3.764*** (0.949)	7.889*** (1.739)	11.740*** (1.827)	8.030*** (1.761)
(f) DcoopHighIncome	9.754*** (0.989)	4.163*** (0.900)	7.071*** (1.570)	11.833*** (1.712)	7.049*** (1.595)

Legend: The table reports the value of the Dcoop variables in estimates where (row a) Mundlak effects have been added. (rows b) a DcoopTrend variable (Dcoop multiplied by linear time trend) has been added plus Mundlak effects; (row c) continuous variables have been winsorized on 1st and 99th centile values and Mundlak effects have been added; (row d) continuous variables have been winsorized on 5th and 95th centile values and Mundlak effects have been added; (row e) only coop banks belonging to the largest size quintile have been included and Mundlak effects have been added; (row f) only high income countries have been included and Mundlak effects have been added. Specifications (1)-(5) are the corresponding ones from Table 4.

Table A.3 Robustness check on the cooperative bank impact on derivatives/total assets

VARIABLES	(1)	(2)
(a) DcoopWinsorized 1-99	-0.02** (0.001)	-0.010*** (0.001)
(b) DcoopWinsorized 5-95	-0.02* (0.001)	-0.031*** (0.001)
(c) DcoopLargestQuintile	-0.015*** (0.004)	-0.015*** (0.005)
(d) DcoopHighIncome	-0.010** (0.005)	-0.009** (0.004)

Legend: The table reports the value of the Dcoop variables in estimates where: (row a) continuous variables have been winsorized on 1st and 99th centile values; (row b) continuous variables have been winsorized on 5th and 95th centile values ; (row c) only coop banks belonging to the largest size quintile have been included ; (row d) only high income countries have been included.

Specifications in column (1) correspond to that of Table 5 column 1, while in specification of column (2) Mundlak effects have been added.

Table A.4 Robustness check on the cooperative bank impact on standard deviation of ROA and ROE

	(1)	(2)	(3)	(4)
Dcoop	-0.291*** (0.088)	-1.941** (0.897)	-1.724*** (0.637)	-0.260*** (0.100)
DcoopTrend	-0.008* (0.005)	-0.045 (0.054)	-0.024*** (0.008)	-0.085 (0.097)
DcoopWinsorize 5-95	-0.284*** (0.099)	-2.712*** (0.548)	-0.307*** (0.083)	-4.038*** (0.660)
DcoopWinsorize 1-99	-0.283*** (0.097)	-2.777*** (0.542)	-0.312*** (0.082)	-4.104*** (0.665)
DcoopLargestQuintile	-0.198*** (0.062)	-2.660*** (0.598)	-0.237*** (0.059)	-3.098*** (0.663)
DcoopHighIncome	-0.291*** (0.088)	-1.724*** (0.637)	-0.260*** (0.100)	-1.941** (0.897)

Legend. The table reports the value of the Dcoop variables in estimates where i) a DcoopTrend variable (Dcoop multiplied by linear time trend) has been added (row 2); ii) continuous variables have been winsorized on 1st and 99th centile values (row 3); iii) continuous variables have been winsorized on 5th and 95th centile values (row 4); iv) only coop banks belonging to the largest size quintile have been included (row 5); v) only high-income countries have been included (row 6).

Dependent variable: (1) standard deviation of ROA 4-year panel; (2) standard deviation of ROE 4-year panel; (3) standard deviation of ROA 6-year panel; (4) standard deviation of ROE6-year panel.

Table A.5 Robustness checks. Difference-in-difference tests on the impact of the global financial crisis on the coop/non coop difference (dependent variable: net loans/total assets, Mundlak effects included)

	(1)	(2)	(4)	(5)
<i>Panel a</i>				
Dcoop	10.701*** (0.989)	9.694*** (0.960)	10.573*** (0.970)	5.090*** (0.888)
Dcrisis	-0.072 (0.385)	-0.053 (0.384)	-0.087 (0.391)	-0.040 (0.389)
DcoopDcrisis	-1.185*** (0.229)	-1.080*** (0.229)	-1.180*** (0.231)	-1.128*** (0.230)
<i>Panel b</i>				
DcoopWinsorize 1-99	8.974*** (0.866)	7.967*** (0.859)	9.954*** (0.881)	6.449*** (0.854)
Dcrisis	-0.422 (0.369)	-0.373 (0.369)	-0.424 (0.369)	-0.386 (0.369)
DcoopDcrisis	-0.694*** (0.250)	-0.624** (0.251)	-0.713*** (0.250)	-0.667*** (0.251)
<i>Panel c</i>				
Dcoop Winsorize 5-95	8.888*** (0.835)	7.919*** (0.827)	9.970*** (0.855)	6.600*** (0.824)
Dcrisis	-0.363 (0.352)	-0.316 (0.352)	-0.361 (0.352)	-0.324 (0.352)
DcoopDcrisis	-0.688*** (0.237)	-0.620*** (0.238)	-0.712*** (0.236)	-0.669*** (0.238)
<i>Panel d</i>				
DcoopLargestQuintile	8.878*** (1.034)	7.961*** (1.006)	8.877*** (1.034)	4.517*** (0.960)
Dcrisis	-0.445 (0.428)	-0.436 (0.428)	-0.472 (0.434)	-0.425 (0.431)
DcoopDcrisis	-1.291*** (0.325)	-1.150*** (0.324)	-1.278*** (0.327)	-1.195*** (0.326)
<i>Panel e</i>				
DcoopHighIncome	10.333*** (1.021)	9.454*** (0.995)	10.346*** (0.997)	4.733*** (0.911)
Dcrisis	-0.242 (0.405)	-0.246 (0.405)	-0.241 (0.411)	-0.207 (0.408)
DcoopDcrisis	-0.934*** (0.233)	-0.853*** (0.232)	-0.934*** (0.234)	-0.907*** (0.233)

Legend: The table reports the value of the Dcoop variables in estimates where Mundlak effects have been added. In panel a) a DcoopTrend variable (Dcoop multiplied by linear time trend) has been added. In panel b) continuous variables have been winsorized on 1st and 99th centile values. In panel c) continuous variables have been winsorized on 5th and 95th centile values. In panel d) only coop banks belonging to the largest size quintile have been included. In panel e) only high-income countries have been included. Specifications (1)-(5) are the corresponding ones from Table 4.

Table A.6 Robustness checks. Difference-in-difference tests on the impact of the global financial crisis on the coop/non coop difference (dependent variable: standard deviation of ROA or ROE, Mundlak effects included)

	(1)	(2)	(3)	(4)
<i>Panel a</i>				
Dcoop	-0.323*** (0.082)	-2.116*** (0.542)	-0.435*** (0.095)	-2.025*** (0.767)
Dcrisis	0.077 (0.069)	0.886 (0.571)	0.027 (0.136)	-1.776** (0.872)
DcoopDcrisis	-0.066* (0.036)	-0.149 (0.422)	-0.096** (0.047)	-0.828 (0.562)
<i>Panel b</i>				
DcoopWinsorized 1-99	-0.206* (0.106)	-1.920*** (0.535)	-0.189* (0.103)	-2.522*** (0.752)
Dcrisis	0.148 (0.153)	0.526 (0.884)	0.173 (0.195)	-1.235 (0.854)
Dcoopcrisis	-0.137* (0.073)	-1.175** (0.492)	-0.109* (0.064)	-1.286** (0.598)
<i>Panel c</i>				
DcoopWinsorized 5-95	-0.206* (0.106)	-1.920*** (0.535)	-0.189* (0.103)	-2.527*** (0.761)
Dcrisis	0.148 (0.153)	0.526 (0.884)	0.173 (0.195)	-1.215 (0.855)
DcoopDcrisis	-0.137* (0.073)	-1.175** (0.492)	-0.109* (0.064)	-1.266** (0.596)
<i>Panel d</i>				
DcoopLargestQuintile	-0.176** (0.069)	-3.053*** (0.729)	-0.240*** (0.088)	-3.053*** (0.729)
Dcrisis	0.074 (0.073)	0.603 (0.582)	-0.037 (0.139)	0.603 (0.582)
DcoopDcrisis	-0.047 (0.048)	0.609 (0.760)	-0.075 (0.072)	0.609 (0.760)

Legend: The table report the value of the Dcoop variables in estimate where Mundlak effects have been added. In panel a) a DcoopTrend variable (Dcoop multiplied by linear time trend) has been added. In panel b) continuous variables have been winsorized on 1st and 99th centile values. In panel c) continuous variables have been winsorized on 5th and 95th centile values. In panel d) only coop banks belonging to the largest size quintile have been included. Dependent variables: (1) standard deviation of ROA 4-year panel; (2) standard deviation of ROE 4-year panel; (3) standard deviation of ROA 6-year panel; (4) standard deviation of ROE6-year panel.

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