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Is There a Cooperative Bank Difference?

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Abstract

We compare characteristics of cooperative and non cooperative banks at world level in a time spell including the global financial crisis. Cooperative banks have higher net loans/total assets ratio, lower income from non traditional activities and lower shares of derivatives over total assets than non cooperative banks. From an econometric point of view, we find that the cooperative bank specialization has a positive and significant effect on the net loans/total assets ratio in the overall sample period and in the post financial crisis subperiod. Derivatives (both in terms of assets and revenues) have a quantitatively strong and significant negative effect on the same dependent variable during both time spells. We finally document that, in a conditional convergence specification, the net loans/total assets ratio is positively and significantly 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.

Keywords: cooperative banks, value added, global financial crisis.

JEL numbers G21, O40, E44.

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1. Introduction

In the globalized economic and financial scenario high income countries pay to globalization a social dividend that they try to offset by earning a monetary dividend. The social dividend takes the form of enhanced competition with cheap labour in other regions, which endangers countries' capacity to produce and tax at domestic level. The monetary dividend is the opportunity to use unconventional monetary policies by exploiting the weaker link between money creation and inflation.¹ This last circumstance leads to the crucial point of whether the financial system is actually tailored to fit one of its main original purposes that is, whether the banks address the augmented monetary resources to loans for economic growth or, on the contrary, to income generation from non traditional activities (such as derivative trading). The related concern is whether the two different uses of monetary resources have different impact on economic growth.

As is well known, these two issues are of paramount importance since 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).

On the side of financial instruments, derivatives may perform an important role as well 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.

¹ The Federal Reserve in the United States started to exploit the “monetary dividend” with quantitative easing policies after the 2007 global financial crisis and ended up by purchasing up to 85 billion dollars of T-bills every month in open market operations at 2013. A similar aggressive approach was followed by the Japanese Prime Minister Abe and the Bank of Japan leading the way to the definition of the so called “Abenomics”. While the Federal Reserve has decided to target more directly unemployment rates, the European Central Bank (ECB) has also started to use unconventional monetary policies within the limits posed by its treaty which does not allow it to go beyond the control of inflation. However, with long term refinancing operations (LTROs) governor Draghi started lending large amounts of money to banks at very cheap rates. He found support for this measure within the limits of the ECB mandate by claiming at the risk of too low inflation or deflation and at the distortive effects in the transmission of monetary policies generated by the government bond spread crisis between South and North Eurozone countries. A policy of cheap lending to commercial banks has been followed in the same period also by the Bank of England which, however, subordinated cheap financing to documented positive changes in the volume of bank intermediated loans under the “funding for lending” approach.

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). Most recent empirical evidence, however, documents that this relationship has weakened 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, presumably as a consequence of financial liberalisation. Arcand, Berkes and Panizza (2012) find that the nexus between finance and real economy is non monotonic, and argue 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. An underlying common story behind these research contributions is that a higher amount of “traditional” banking activities, measured in terms of net loans/total assets share is conducive of higher support to economic growth, while non traditional banks have extensively moved from their traditional lending activity towards proprietary trading and purely financial business such as 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.²

Our paper starts from the theoretical and empirical background described above, and looks at the problem by comparing performance and characteristics of “traditional” (non cooperative) and cooperative banks. Due to their institutional characteristics, cooperative banks have specific statutory rules (*i.e.* one share-one vote, and constraints on the distribution of profits that have to be accumulated into reserves), which make them typically more oriented towards traditional lending activities. These same statutory goals imply an implicit departure from straight profit maximization strategies. Since the decision to be a cooperative or non cooperative bank often dates back in the past and may well be considered as exogenous, differences in intensity of traditional intermediation activity may be reasonably

² See, among others, Lopez Espinosa *et al.* (2011).

attributed to causal effects generated by the two organizational forms, and not affected by endogeneity or reverse causality. 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 world wide sample of banks and analyse, in a second step, whether a higher net loans/total assets ratio affects the growth of value added in different sectors classified ex ante on the basis of their dependence from external finance and technological intensity.

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

2. Cooperative banks and their characteristics

According to the International Cooperative Alliance (ICA) a cooperative 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*”. 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.

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 plays a non negligible role in the financial system and more so if we look at its share of traditional intermediation activity.

At world level financial cooperatives reach over 621 million people in the G-20 nations and provide US\$3.6 trillion in loans, hold US\$4.4 trillion in savings and have

US\$7.6 trillion in total assets. Within the cooperative family the International Cooperative Bank Association (ICBA) includes all banks taking this form in different countries and, among them, *Banche cooperative* and *Banche popolari* in Italy, *Building societies* and *Credit unions* in the UK, and *Mutual savings and loans* and *Credit unions* in the United States. These are not just small sized banks; the *Crédit Agricole*, for instance, ranked ninth among the top 50 banks in terms of shareholder equity in 2008, while other institutions 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 (10 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.

The attention to cooperative and non profit maximizing banks has risen after the beginning of the global financial crisis when academics, politicians and the public opinion wondered whether their specific characteristics provided them with a safer shelter against the global financial crisis, and avoided them to propagate it.³ However, the literature comparing performance and characteristics of cooperative and non cooperative banks is still scant. From a theoretical point of view we expect that the different goal of cooperative banks and their mission to finance local business may have both pros and cons in terms of quality of credit. On the one side, being smaller in size and with a stronger focus on local business, may produce those types of “arm

³ In 2009 ICBA declared: “*In this financial crisis, the cooperative banking business model, relying on democratic governance, members’ participation, proximity and the satisfaction of its members and clients interests, showed its benefits as a factor of stability and financial security for millions of people. Indeed, cooperative banks have a long term view and don’t rely on the financial market to raise their capital: their first aim is not to maximise profit for the benefit of their shareholders but to provide the best possible products and services to their members. The recent financial crisis proves that the co-operative banking business model is, more than ever, appropriate and relevant*”.

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 among others). On the other side, local banks might be more at risk of local political capture and higher indulgence towards local business if the relationship between lenders and borrowers is non anonymous and “warmer”. These last two effects may conversely reduce the quality of credit.

From an empirical point of view, Altunbas *et al.* (2001) find no evidence of differences in efficiency related to the different forms of bank ownership, while Hansmann (1996) and Chaddad and Cook (2004) find that mutual financial institutions in the United States tend to adopt less risky strategies than demutualized ones. Hesse and Cihák (2007) find that cooperative banks return, profitability and capitalisation are relatively less volatile and relate these characteristics to the mentioned ability of cooperative banks to use customer surplus as a cushion in weaker periods. Brunetti, Ciciretti, and Djordjevic (2014) find that during the global financial crisis households using cooperative banks switch to non cooperative banks 9 percent less than those using non cooperative banks and moving to cooperative institutions.

Within this framework a main proposition of our paper is that traditional credit activity occurs in a very competitive environment with tiny profit margins. As a consequence, profit maximizing banks will find relatively less convenient than cooperative non profit maximizing companies to dedicate their activity to traditional intermediation and will commit a relatively higher share of their total assets to proprietary trading and derivative trading, an activity which promises potentially higher returns. In the final part of our empirical analysis we also 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 sectors defined in terms of high/low technology or high/low dependence from external finance.

3. Data and descriptive statistics

Our analysis focuses on a sample of 32 countries over the period 1998-2010. In particular, our dataset comprises a total of 140,660 bank-year observations.⁴ The data

⁴ 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,

we use derive from three different sources. Detailed financial information on the banks operating in the different countries come from Bankscope, a comprehensive, global database of banks' financial statements, ratings and intelligence created predominantly from filed balance sheets and income statements as well as notes from the audited annual reports.

[insert Table 1 about here]

Data on the value added of the manufacturing sectors at 3-digit level of ISIC (Revision 3) are drawn 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 World Development Indicators. Table 1 provides variables' definition, sources and level, while Table 2 presents the country breakdown of our bank-year observations.

[insert Table 2 about here]

The share of cooperative banks in our sample is quite uneven in the 32 countries covered by the Bankscope database. More specifically, we find that cooperative banks account, in descending order, 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 Brazile, Malaysia, Mexico, Sweden and the United Kingdom.

Table 3 presents descriptive statistics for cooperative and non cooperative banks of the variables used in the econometric analyis. On average, cooperative banks have a net loans/total assets ratio of 58.8 percent compared to 53.6 percent of non cooperative

Malaysia, Mexico, Netherlands, Poland, Portugal, Saudi Arabia, Singapore, South Africa, Spain, Sweden, Switzerland, Thailand, United Kingdom.

banks. This seems to confirm, at least from a descriptive point of view, the expected stronger focus of cooperative banks on traditional intermediation activity. In terms of time dynamics we start with a 10 point difference in 1998 and end up with a narrower 3.3 point difference in 2010 (Figure 1).

[insert Figure 1 about here]

Cooperative banks also have a smaller share of derivatives over total assets (0.003 against 0.03) and 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 derivatives trading) we find that cooperative banks have, as expected, 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). 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 the above mentioned differences in means between cooperative and non cooperative banks are significant at 99 percent.⁵

[insert Table 3 about here]

⁵ 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.

4. Empirical strategy

4.1. Model specification

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:

$$\begin{aligned} NetLoan/TotAss_{ijt} = & \alpha_0 + \alpha_1 Dcoop_{ijt} + \alpha_2 \ln(Size)_{ijt} + \alpha_3 ShareTrad_{ijt} + \\ & + \alpha_4 ShareNonTrad_{ijt} + \alpha_5 Deriv/TotAss_{ijt} + \\ & + \sum_j \beta_j DCountry_j + \sum_t \gamma_t DYear_t + \varepsilon_{ijt} \end{aligned} \quad (1)$$

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 . 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 and traditional banks with higher credit activity have generally 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. Among right hand side variables *Dcooperative* is a dummy variable taking value one if the bank is cooperative and zero otherwise, while controls include the log of the number of employees – $\ln(Size)$ – as a proxy for 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. The introduction of country dummies is important since it allows to control for country or macroregional specific institutional characteristics (e.g. rules on classification of impaired loans, Basel type rules, etc.) as well as monetary policy factors (e.g. interest rate spreads). All estimates are clustered at bank/country level in order to take into account that between variance is larger than within variance.

4.2. Econometric findings

In the first estimate with year and country dummies and only bank size included as control we find that cooperative banks have a 7.7 difference in the loans to total asset ratio *vis-à-vis* non cooperative banks on about 48,000 observations (Table 4,

column 1). The log of the number of employees – $\ln(\text{Size})$ – has a positive and significant effect on the dependent variable, which is nonlinear and concave.⁶ Year dummies document a downward trend in the dependent variable confirming that a disintermediation process is at work, while country dummies highlight that sample countries where the net loans/total assets ratio is above the omitted benchmark (*i.e.* the United Kingdom) are Switzerland, the Netherlands, Germany, France, Denmark, Hungary, Greece, Portugal, Sweden and Spain. A country that is far below the omitted benchmark is Luxembourg, which confirms to have a banking system more oriented towards financial than traditional credit activities. When adding the share of income from traditional and non traditional activities (Table 4, column 2), we find that the cooperative dummy effect remains significant while its magnitude falls to 6.4. The share of income from traditional activities is highly significant and positive as expected. Its coefficient implies that a one percent higher share of income from loans - out of a total income made of the sum of derivatives net gains, fees from services and loan income - produces a 0.1 percent change in the net loans/total assets ratio. Note 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 and find that its effect is strongly negative and significant, while significance of all other variables remains robust to this introduction. In terms of economic significance a one percent increase in the derivatives to total assets ratio reduces by 0.5 percent the net loans/total assets ratio.

In the last three columns of Table 4 (columns 1a-3a) we repeat the above three specifications limiting our time period to the post financial crisis spell (from 2007 onwards). The cooperative effect remains strongly robust and all other variables keep their sign and significance. In terms of magnitude, the cooperative effect is slightly smaller in the crisis period (5.1 in the first and 3.9 in the second estimate) if we do not include the control for derivatives activity, while it becomes much higher when accounting for this factor (8.7). This suggests that the higher intensity of cooperative

⁶ 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. When finding that both variables are significant we choose this more parsimonious specification that reduces collinearity in the estimates.

traditional intermediation activity is not countercyclical, at least if we do not control for derivatives activity.

[insert Table 4 about here]

Note that what measured so far in Table 4 is a mix of between and within effects. 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 the model. However, this would make impossible to jointly test the impact of the time invariant cooperative dummy. We address this issue by following Mundlak (1978) approach and introduce between effects via time average of the time varying regressors in the estimates. When doing so (Table 5) we find that all signs and significance discussed above are generally robust, and in the same direction of what found in Table 4. This occurs both in the overall sampe period (Table 5, columns 1-3) and in the post crisis subperiod (Table 5, columns 1a-3a). Note, however, that the cooperative effect is high in the first specification, when just controlling for bank size (between 6 and 5 points in the overall and post 2006 period respectively), it falls abruptly when the share of income from traditional and non traditional activity is introduced (about 2 percent in the overall period, while negative and not significant in the financial crisis), while finally jumping up again when controlling for derivatives activity (2.7 in the overall period, and 3.1 in the post crisis period).

[insert Table 5 about here]

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, as common sense may suggest. More specifically, we test this hypothesis by looking at the effect of the net loans/total assets ratio variable on value added growth of the whole manufacturing sector as well as on different types of industries calssified 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 sectors as the difference between investment and cash generated

from operations. We identify three categories of sectors: “self-financing”, “high financially dependent” and “low financially dependent” based on the original indicators in Rajan and Zingales (1998). These were 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.⁷ 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).⁸

The estimated model is a standard conditional convergence model 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:

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

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 –

⁷ For additional details see <http://www.oecd.org/science/inno/48350231.pdf>.

⁸ Appendix I 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).

$\ln(HumanCap)_{ijt-k}$ – 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) complete the set of regressors included in the estimates. The equation is estimated separately (Table 6, columns 1-6) and, in a later step, simultaneously within a two-equation system which includes the Mundlak augmented version of (1) (Table 7, columns 1-6).

[insert Table 6 about here]

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 7. 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.

[insert Table 7 about here]

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 main problems 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 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 the above propositions. Cooperative banks display, as expected, higher loans to total assets ratios than non cooperative banks throughout the whole analysed period. They also have higher share of income from lending activity *vis-à-vis* services and derivative trading. However, their difference in terms of loan intensity does not increase (actually tightens a bit) during the global financial crisis. In addition to that, and perhaps more important, a higher net loans/total asset 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.

From a more general perspective our findings confirm that “biodiversity” in the financial system is important and must be carefully taken into account by regulators. Different types of banks exist and, more specifically, the specificity of cooperative banks has important distinctive features and helps value added growth of specific sectors of the economy.

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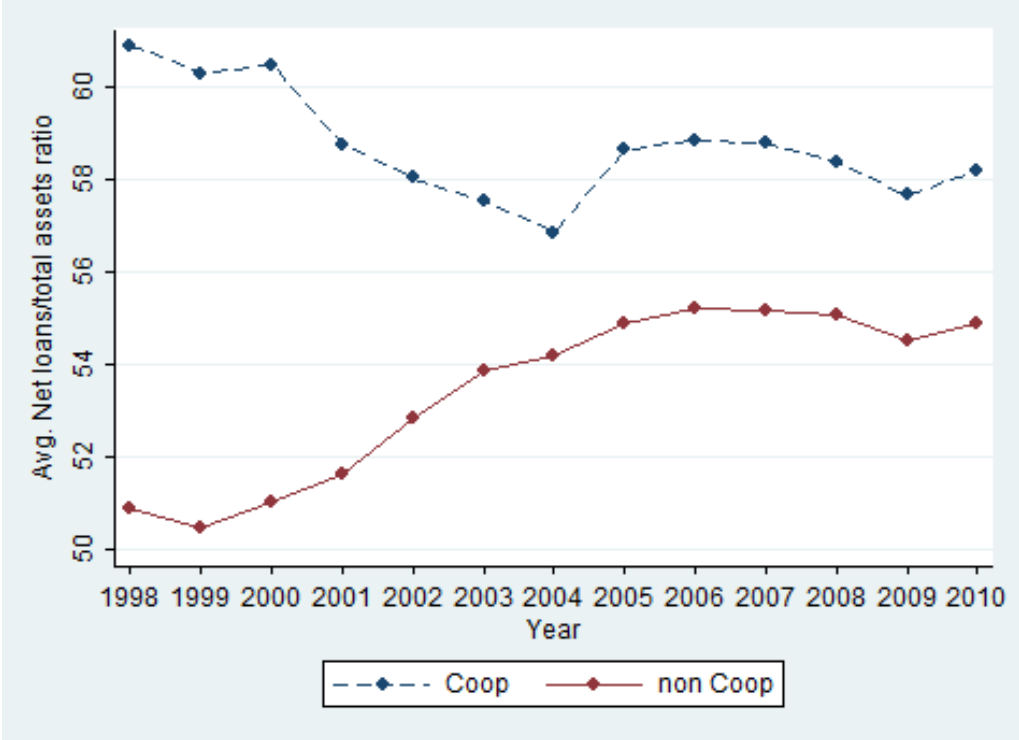
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Figure

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 Coop and non Coop banks. *x-axis* variable is **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 non traditional activities (%)	Bankscope	Bank
<i>ShareNonTrad</i>	Income share from traditional activities (%)	Bankscope	Bank
<i>Tier1Ratio</i>	Tier 1 ratio (%)	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 cooperative bank (1=yes, 0=no)	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>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

Table 2. 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 3. 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)

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

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

Table 4. The determinants of Net loans/total assets ratio

	(1)	(2)	(3)	(1a)	(2a)	(3a)
Dcoop	7.687*** (0.684)	6.361*** (0.634)	7.855*** (1.413)	5.144*** (0.783)	3.878*** (0.733)	8.693*** (1.481)
ln(Size)	2.091*** (0.271)	2.077*** (0.235)	1.688*** (0.326)	1.426*** (0.260)	1.419*** (0.225)	1.925*** (0.354)
ShareTrad		13.619*** (1.255)	16.697*** (2.125)		10.695*** (1.363)	14.340*** (2.509)
ShareNonTrad		-1.322 (1.958)	1.311 (2.734)		-4.130** (1.888)	1.978 (3.356)
Deriv/TotAss			-46.744*** (6.422)			-39.661*** (5.837)
DCountry_Austria	6.757*** (2.016)	4.724** (1.954)	0.599 (3.264)	3.888 (2.377)	2.432 (2.319)	1.349 (3.546)
DCountry_Belgium	-2.776 (3.396)	-2.343 (3.276)	-4.329 (7.515)	-2.710 (4.556)	-2.240 (4.339)	-2.944 (7.825)
DCountry_Brazil	-16.603*** (3.174)	-18.543*** (3.090)	-12.959*** (4.085)	-2.170 (4.098)	-3.469 (4.010)	-4.195 (4.695)
DCountry_Canada	4.585 (7.514)	12.817 (10.783)	7.425 (11.594)	5.340 (7.523)	12.925 (10.986)	8.397 (11.800)
DCountry_Czech Republic	3.495 (3.815)	4.357 (3.751)	6.927 (5.239)	7.380 (4.600)	7.872* (4.566)	9.374 (5.845)
DCountry_Denmark	15.643*** (2.110)	13.806*** (2.011)	12.055* (6.398)	16.669*** (2.247)	15.138*** (2.163)	12.789* (7.327)
DCountry_Finland	9.223* (5.325)	8.369 (5.173)	8.375 (6.855)	6.838 (6.980)	6.944 (6.666)	9.281 (7.014)
DCountry_France	7.920*** (2.137)	9.290*** (2.056)	6.886** (3.258)	9.017*** (2.406)	10.327*** (2.331)	8.679** (3.399)
DCountry_Germany	8.396*** (1.665)	8.040*** (1.595)	-4.688 (3.369)	6.293*** (1.880)	6.177*** (1.818)	-4.344 (3.584)
DCountry_Greece	14.260*** (4.163)	14.265*** (4.077)	13.576*** (4.194)	22.934*** (3.794)	22.367*** (3.762)	14.886*** (3.552)
DCountry_Hong Kong	-9.322 (5.975)	-9.554* (5.500)	-3.025 (6.934)	-10.710 (6.902)	-10.517* (6.371)	-2.130 (7.182)
DCountry_Hungary	12.868*** (4.105)	12.256*** (3.984)	5.646 (5.319)	14.664*** (4.960)	14.922*** (4.825)	5.025 (6.133)
DCountry_India	-1.830 (2.819)	-2.447 (2.706)	17.197* (9.815)	7.449* (3.992)	6.484* (3.802)	45.996*** (2.420)
DCountry_Indonesia	2.548 (2.661)	1.180 (2.590)	1.685 (3.317)	10.221*** (2.683)	8.784*** (2.588)	9.324*** (3.188)
DCountry_Ireland	-1.103 (3.596)	-2.551 (3.478)	-2.265 (4.292)	-1.834 (4.909)	-1.614 (4.672)	1.102 (4.922)
DCountry_Italy	13.825*** (1.784)	13.824*** (1.706)	17.265*** (2.473)	17.176*** (2.010)	17.258*** (1.936)	19.161*** (2.591)
DCountry_Japan	1.716 (1.768)	-0.397 (1.686)	-12.829*** (2.537)	-0.233 (2.001)	-1.974 (1.926)	-11.034*** (2.649)
DCountry_Republic of Korea	8.628* (4.860)	7.970* (4.485)	3.334 (5.436)	9.806* (5.241)	8.595* (5.147)	7.045 (5.320)
DCountry_Luxembourg	-22.484*** (2.153)	-22.833*** (2.102)	-16.129*** (4.577)	-21.127*** (2.687)	-21.325*** (2.634)	-14.592*** (4.929)
DCountry_Malaysia	-4.115 (3.637)	-4.083 (3.378)	-7.328 (13.118)	-4.305 (7.793)	-4.686 (7.121)	-17.473 (13.349)
DCountry_Mexico	-0.661 (5.252)	-2.815 (4.816)	0.155 (6.089)	-19.547 (12.209)	-20.602* (10.588)	-27.684** (11.388)
DCountry_Netherlands	10.161*** (3.064)	9.517*** (2.958)	6.994* (3.994)	4.991 (3.958)	5.379 (3.881)	8.957** (4.530)
DCountry_Poland	7.129* (3.760)	6.518* (3.591)	7.122* (4.280)	10.810*** (4.144)	10.329*** (3.946)	10.126** (4.612)
DCountry_Portugal	10.339** (4.094)	10.382*** (3.854)	10.553** (5.007)	13.409*** (4.667)	13.211*** (4.562)	14.199*** (5.261)

(continues next page)

Table 4 (continued). The determinants of Net loans/total assets ratio

	(1)	(2)	(3)	(1a)	(2a)	(3a)
DCountry_Saudi Arabia	-0.954 (3.297)	-3.071 (3.297)	-0.436 (2.957)	5.880 (4.238)	3.445 (4.354)	8.948*** (2.632)
DCountry_Singapore	-6.809 (4.537)	-6.817 (4.388)	-10.089 (6.649)	-3.328 (9.972)	-2.777 (9.143)	-15.442** (6.490)
DCountry_South Africa	4.658 (4.063)	5.182 (3.770)	-1.491 (5.014)	4.333 (4.567)	4.398 (4.322)	1.783 (5.406)
DCountry_Spain	19.631*** (2.178)	19.051*** (2.077)	19.341*** (2.544)	19.269*** (2.349)	18.860*** (2.275)	20.136*** (2.649)
DCountry_Sweden	27.059*** (2.495)	24.574*** (2.347)	21.730*** (3.715)	24.450*** (2.689)	22.576*** (2.571)	24.004*** (3.803)
DCountry_Switzerland	20.766*** (2.107)	19.782*** (1.981)	-13.557*** (4.272)	19.305*** (2.341)	18.658*** (2.209)	-13.132*** (4.561)
DCountry_Thailand	6.163 (4.484)	5.363 (4.371)	-15.641 (9.850)	5.607 (6.456)	4.574 (6.093)	-21.735** (9.367)
DYear_1999	-0.322** (0.139)	-0.188 (0.140)	-2.422 (3.044)			
DYear_2000	-0.095 (0.175)	0.160 (0.177)	-7.425** (3.263)			
DYear_2001	-1.291*** (0.190)	-1.117*** (0.189)	-6.749** (3.302)			
DYear_2002	-1.557*** (0.212)	-1.393*** (0.210)	-6.311* (3.759)			
DYear_2003	-2.002*** (0.233)	-1.666*** (0.230)	-6.024 (3.718)			
DYear_2004	-2.476*** (0.250)	-2.147*** (0.246)	-4.380 (3.733)			
DYear_2005	-2.933*** (0.262)	-2.607*** (0.257)	-3.403 (3.798)			
DYear_2006	-3.222*** (0.263)	-2.864*** (0.259)	-2.368 (3.800)			
DYear_2007	-3.265*** (0.267)	-2.892*** (0.264)	-1.536 (3.802)	39.334*** (2.260)	0.493*** (0.143)	-0.986*** (0.293)
DYear_2008	-3.666*** (0.279)	-3.234*** (0.277)	-0.400 (3.823)	38.932*** (2.258)	0.143 (0.123)	0.000 (0.000)
DYear_2009	-4.273*** (0.285)	-3.778*** (0.281)	-0.644 (3.833)	38.349*** (2.264)	-0.384*** (0.088)	-0.256 (0.249)
DYear_2010	-3.868*** (0.290)	-3.352*** (0.289)	-0.340 (3.846)	38.730*** (2.268)	0.000 (0.000)	0.010 (0.304)
Constant	36.832*** (2.117)	27.343*** (2.250)	27.998*** (5.015)	0.000 (0.000)	31.755*** (2.393)	25.931*** (3.955)
Observations	47,988	47,843	6,798	18,647	18,611	4,893
Number of index	7,654	7,631	2,003	5,637	5,623	1,856

Legend: **DCountry_**: country dummies; **DYear_**: year dummies; for other variables definition 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; **(1a)** specification estimate of **(1)** limited to the the post financial crisis period (from 2007 onwards); **(2a)** specification estimate of **(2)** limited to the the post financial crisis period (from 2007 onwards); **(3a)** specification estimate of **(3)** limited to the the post financial crisis period (from 2007 onwards). *United Kingdom* is the omitted benchmark for country dummies.

*** p<0.01, ** p<0.05, * p<0.1; (Robust Standard Errors).

Table 5. The determinants of Net loans/total assets ratio (controlling for Mundlak between effects)

	(1)	(2)	(3)	(1a)	(2a)	(3a)
Dcoop	6.492*** (0.646)	1.937*** (0.545)	2.869** (1.287)	4.590*** (0.771)	-0.715 (0.647)	3.094** (1.320)
ln(Size)	2.788*** (0.468)	2.803*** (0.453)	1.714* (0.996)	2.326*** (0.675)	2.119*** (0.620)	2.738* (1.460)
ShareTrad		8.529*** (1.388)	8.709*** (2.466)		2.283 (1.556)	3.369 (2.753)
ShareNonTrad		1.932 (2.032)	0.176 (2.958)		-0.684 (1.892)	-0.581 (3.466)
Deriv/TotAss			-36.175*** (7.536)			-22.849*** (6.646)
E _t [ln(Size)]	-1.610*** (0.495)	-0.979** (0.474)	0.190 (1.015)	-1.325* (0.706)	-0.404 (0.643)	-0.709 (1.471)
E _t [ShareTrad]		37.609*** (2.352)	39.818*** (4.634)		46.753*** (2.795)	45.215*** (4.967)
E _t [ShareNonTrad] _t		-38.534*** (4.550)	0.827 (7.197)		-34.317*** (5.011)	3.748 (7.693)
E _t [Deriv/TotAss]			-25.849* (15.458)			-39.677*** (15.186)
DCountry_Austria	6.545*** (2.017)	-2.247 (1.933)	-0.678 (3.143)	3.832 (2.378)	-3.032 (2.310)	-0.255 (3.340)
DCountry_Belgium	-3.080 (3.378)	-2.437 (3.316)	-1.863 (7.137)	-2.626 (4.552)	-0.758 (3.968)	-0.591 (7.354)
DCountry_Brazil	-15.715*** (3.132)	-26.506*** (3.043)	-18.869*** (4.098)	-1.995 (4.113)	-9.473*** (3.622)	-8.180* (4.855)
DCountry_Canada	8.243 (7.351)	15.037 (9.667)	11.479 (10.500)	7.027 (7.455)	15.367 (9.767)	12.538 (10.591)
DCountry_Czech Republic	3.852 (3.797)	7.274* (4.243)	5.924 (6.316)	7.406 (4.603)	11.170** (5.245)	7.911 (7.145)
DCountry_Denmark	14.983*** (2.105)	7.038*** (1.952)	11.702** (5.675)	16.248*** (2.242)	9.385*** (2.134)	11.803* (6.313)
DCountry_Finland	9.712* (5.208)	8.744* (4.824)	7.931 (6.111)	7.115 (6.918)	7.879 (6.069)	8.318 (6.188)
DCountry_France	8.811*** (2.140)	10.098*** (2.040)	11.713*** (3.383)	9.451*** (2.411)	12.481*** (2.352)	13.479*** (3.502)
DCountry_Germany	8.757*** (1.673)	5.175*** (1.585)	-3.310 (3.102)	6.466*** (1.881)	4.267** (1.841)	-3.412 (3.255)
DCountry_Greece	15.796*** (4.041)	12.816*** (4.206)	12.919*** (4.480)	23.561*** (3.703)	20.808*** (4.087)	13.198*** (3.908)
DCountry_Hong Kong	-7.411 (6.044)	-7.502 (4.750)	-6.095 (5.927)	-9.847 (6.950)	-7.011 (4.398)	-6.003 (6.156)
DCountry_Hungary	13.298*** (4.090)	11.532*** (3.857)	6.169 (4.615)	14.927*** (4.964)	15.132*** (4.520)	5.005 (5.235)
DCountry_India	0.484 (2.782)	-2.549 (2.637)	15.073* (8.780)	8.636** (3.999)	4.363 (3.667)	40.398*** (2.488)
DCountry_Indonesia	3.790 (2.590)	-3.568 (2.660)	-3.075 (3.386)	10.564*** (2.665)	3.201 (2.795)	3.471 (3.339)
DCountry_Ireland	-2.056 (3.605)	-6.148* (3.536)	-3.252 (4.362)	-2.091 (4.902)	-1.090 (4.536)	0.217 (4.881)
DCountry_Italy	14.073*** (1.794)	12.705*** (1.674)	18.698*** (2.498)	17.274*** (2.012)	17.007*** (1.928)	20.111*** (2.654)
DCountry_Japan	2.971* (1.765)	-6.916*** (1.663)	-16.109*** (2.588)	0.439 (2.004)	-8.942*** (1.928)	-14.960*** (2.718)
DCountry_Rep. of Korea	10.206** (4.854)	7.468* (4.033)	0.879 (5.177)	11.099** (5.284)	8.237* (4.758)	4.373 (4.820)
DCountry_Luxembourg	-23.203*** (2.151)	-26.192*** (2.202)	-15.026*** (4.653)	-21.487*** (2.686)	-22.947*** (2.731)	-14.487*** (4.906)
DCountry_Malaysia	-3.877 (3.694)	-6.621** (3.145)	-10.845 (9.612)	-4.477 (7.795)	-6.228 (6.435)	-19.531*** (7.472)
DCountry_Mexico	2.405 (5.376)	-4.227 (3.279)	-5.256 (5.169)	-18.221 (12.344)	-21.611*** (2.323)	-30.265*** (5.688)

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Table 5 (continued). The determinants of Net loans/total assets ratio (controlling for Mundlak between effects)

	(1)	(2)	(3)	(1a)	(2a)	(3a)
DCountry_Netherlands	10.380*** (3.018)	8.658*** (2.892)	6.594 (4.064)	5.248 (3.946)	5.904 (4.014)	8.235* (4.523)
DCountry_Poland	8.905** (3.662)	4.923 (3.425)	4.857 (4.344)	11.659*** (4.107)	7.239* (3.708)	7.084 (4.705)
DCountry_Portugal	10.905*** (4.134)	9.487*** (3.620)	12.648*** (4.514)	13.528*** (4.693)	11.278** (4.570)	14.946*** (4.818)
DCountry_Saudi Arabia	0.849 (3.267)	-8.901*** (3.174)	-6.064** (3.072)	6.461 (4.217)	-3.636 (3.701)	2.831 (2.786)
DCountry_Singapore	-7.135 (4.621)	-5.201 (5.043)	-6.846 (6.227)	-2.787 (9.977)	-1.475 (7.586)	-15.144*** (4.257)
DCountry_South Africa	6.272 (4.069)	6.494* (3.595)	0.966 (4.139)	5.144 (4.566)	5.073 (4.268)	2.531 (4.436)
DCountry_Spain	20.625*** (2.188)	16.261*** (2.013)	18.409*** (2.567)	19.670*** (2.359)	16.514*** (2.252)	18.716*** (2.692)
DCountry_Sweden	25.851*** (2.442)	16.606*** (2.131)	16.882*** (3.369)	23.953*** (2.666)	15.391*** (2.325)	18.128*** (3.423)
DCountry_Switzerland	19.518*** (2.076)	19.650*** (1.796)	-8.704** (3.938)	18.621*** (2.326)	18.618*** (2.069)	-8.888** (4.204)
DCountry_Thailand	7.478* (4.505)	1.028 (4.258)	-15.163** (6.826)	6.302 (6.541)	1.126 (5.522)	-18.921*** (6.493)
DYear_1999	-0.331** (0.139)	-0.219 (0.140)	-2.429 (2.950)			
DYear_2000	-0.122 (0.175)	0.089 (0.177)	-7.268** (3.269)			
DYear_2001	-1.333*** (0.191)	-1.167*** (0.189)	-6.850** (3.369)			
DYear_2002	-1.607*** (0.213)	-1.456*** (0.211)	-6.535* (3.814)			
DYear_2003	-2.046*** (0.234)	-1.791*** (0.231)	-6.262 (3.826)			
DYear_2004	-2.512*** (0.250)	-2.222*** (0.247)	-4.563 (3.882)			
DYear_2005	-2.968*** (0.263)	-2.680*** (0.257)	-3.655 (3.952)			
DYear_2006	-3.278*** (0.265)	-2.955*** (0.261)	-2.601 (3.969)			
DYear_2007	-3.341*** (0.271)	-3.001*** (0.267)	-1.740 (3.982)	0.649*** (0.148)	0.611*** (0.147)	0.000 (0.000)
DYear_2008	-3.764*** (0.285)	-3.396*** (0.282)	-0.663 (4.010)	0.221* (0.123)	0.197 (0.122)	0.855*** (0.301)
DYear_2009	-4.378*** (0.291)	-3.980*** (0.288)	-1.051 (4.016)	-0.373*** (0.087)	-0.384*** (0.087)	0.422 (0.331)
DYear_2010	-3.979*** (0.298)	-3.545*** (0.297)	-0.792 (4.026)	0.000 (0.000)	0.000 (0.000)	0.600* (0.359)
Constant	41.574*** (1.833)	9.582*** (2.417)	5.688 (5.918)	40.907*** (2.098)	5.891** (2.928)	2.092 (4.912)
<i>Observations</i>	<i>47,988</i>	<i>47,843</i>	<i>6,798</i>	<i>18,647</i>	<i>18,611</i>	<i>4,893</i>
<i>Number of index</i>	<i>7,654</i>	<i>7,631</i>	<i>2,003</i>	<i>5,637</i>	<i>5,623</i>	<i>1,856</i>

Legend: DCountry_: country dummies; DYear_: year dummies; for other variables definition see Table (1). $E_t[\cdot]$: time average of the time varying regressor (Mundlak, 1978). (1): panel specification estimate of equation (1) with year and country dummies and only bank size and its time average included as control; (2) panel specification estimate of equation (1) with year and country dummies and bank size, share of income from traditional and non traditional activities and their time averages included as control; (3) panel specification estimate 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 and their time averages included as control; (1a) specification estimate of (1) limited to the the post financial crisis period (from 2007 onwards); (2a) specification estimate of (2) limited to the the post financial crisis period (from 2007 onwards); (3a) specification estimate of (3) limited to the the post financial crisis period (from 2007 onwards). *United Kingdom* is the omitted benchmark for country dummies. *** p<0.01, ** p<0.05, * p<0.1; (Robust Standard Errors).

Table 6. The determinants of Value added growth (controlling for Mundlak between effects)

	(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
<i>Observations</i>	23,365	23,365	23,365	23,365	23,329	23,190
<i>Number of index</i>	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. *** p<0.01, ** p<0.05, * p<0.1; (Standard Errors).

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

	(1)	(2)	(3)	(4)	(5)	(6)
	(1a)	(2a)	(3a)	(4a)	(5a)	(6a)
	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

(continue 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.
*** p<0.01, ** p<0.05, * p<0.1; (Standard Errors).

Table 7 (continued). The determinants of Value added growth (controlling for Mundlak between effects – two equations system)

	(1)	(2)	(3)	(4)	(5)	(6)
	(1b)	(2b)	(3b)	(4b)	(5b)	(6b)
	ΔY	ΔY	ΔY	ΔY	ΔY	ΔY
	(TotMan)	(LowTech)	(HigTech)	(LowExtFin)	(HigExtFin)	(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). $E_t[\cdot]$: time average of the time varying regressor (Mundlak, 1978). **t-2**: initial level of the time varying regressor.

*** p<0.01, ** p<0.05, * p<0.1; (Standard Errors).

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		