Cooperative banks: what do we know about competition, risk preferences and market structure?

Davide Salvatore Mare[a*], Nemanja Radić[b]

[a] *Business School, Credit Research Centre, The University of Edinburgh, UK*

[b] *The Business School, Middlesex University, The Burroughs, London NW4 4BT, UK*

Abstract

There is wide agreement that neglecting key symptoms of the Global Financial Crisis (GFC) led to the occurrence of this market havoc. Yet the discussion on how to design key policy measures has not properly addressed the contribution of the diversity of business models. The presence of credit institutions with mutual ends requires a more thorough treatment of their specificities. As a consequence, we investigate the relationship between competition and financial stability in European cooperative banking over the period 1999 through 2013. Moreover, we include in the analysis the impact of assets diversification and liabilities diversification on the risk preferences of these credit institutions. Our results show that market power increases cooperative banks' solvency and that asset diversification and liabilities diversification are positively related with bank soundness. On the contrary, cooperative banks that diversify the deposit sources are less stable.

JEL-Classification: C23, G21

Keywords: Bank risk-taking, Cooperative banks, Competition, Market structure, Diversification.

** Corresponding author: Credit Research Centre, University of Edinburgh Business School, 29Buccleuch Place, EH89JU, Edinburgh, UK. Phone: +44 (0)1316515077, Fax: +44 (0)1316513197, E-mail: davide.mare@ed.ac.uk*

1 Introduction

Cooperative banks contribute to the diversity of the European banking market. Yet their importance and specific business model has not received the necessary attention from pundits, regulators and policy makers (Kalmi, 2007). Specifically, in the design of policies to increase the resilience of the European banking market, the specific mutualistic nature of these credit institutions raises interesting questions regarding the determinants of their solvency.

Ccooperative banks are important banking players for smoothing the effects of tight monetary policy (Ferri et al., 2014) and for the local economic developments (Hakenes et al., 2014). Moreover, these credit institutions contribute to the diversity of the European banking industry (Ayadi et al., 2010). Yet, in important issues related to the individual bank stability the empirical and theoretical evidence is contentious. For instance, the view on the corporate governance these institutions and its effects on the individual and systemic stability is debated. Groeneveld and Llewellyn (2012) demystify the classical argument that weak corporate governance characterises cooperative banks while Fonteyne (2007) points out that weakness leads to the inefficient management of cooperative banks. Our view is that a fundamental aspect of the study of cooperative banks is to be retrieved in their competitive behaviour and diversification strategy.

We analyse a large sample of cooperative banks in 17 European countries over the period 1999 through 2013. We show that market power increases individual bank stability as well as assets diversification and liabilities diversification. Diversification in customer deposits is associated with more unstable banks hence this is key in terms of potential issues related to increased competition in the market for deposits.

The remainder of the paper is structured as follows. Section 2 summarizes the literature review. Section 3 presents the data and variables employed in the analysis. In section 4, we discuss the empirical approach. Section 5 summarises the results from the estimations and the robustness checks. Section 6 concludes.

2 Literature review

We empirically assess the relationship between competition, risk preferences and market structure in cooperative banking. The existing literature mainly covers commercial banking although the mutual end of cooperative banks suggests profound differences that should be explicitly taken into account.

The theoretical literature proposes two contentious views that are based on different premises. The competition-fragility view (Marcus, 1984; Keeley, 1990) hinges in the risk-taking incentives of shareholders subsequent to the decline in bank franchise value. This channel is particularly weak in cooperative banks as customers are also members of these credit institutions (Fiordelisi and Mare, 2014). Moreover, cooperative banks create value through the unique nature of the relationships not only with the borrowers, but also with the local environment where they operate. The competition-stability view (Boyd and De Nicolò, 2005; De Nicolò and Lucchetta, 2009) focuses on the lending channel and advocates that, in a classical asymmetric framework, higher interest rate charges exacerbate the adverse selection and moral hazard problems. It follows that lower competition is associated with higher risk in the credit portfolio leading to higher likelihood of bank's insolvency. Martinez-Miera and Repullo (2010) extend this reasoning by allowing for imperfect correlation of loan defaults. The authors suggest the existence of two separate effects: a margin effect due to lower prices charged to customers in more competitive market and a risk-shifting effect favoured by the asymmetric information mechanism. The theoretical and numerical prediction is that there exists a U-shaped relationship between the number of banks and banks' probability of failure. The reasoning leaves out important aspects for cooperative banks, namely the efficiency in the lending process and the role of competition in the market for deposits. Cooperative banks are constrained in the availability of sources of funding as they cannot easily either raise capital or access the wholesale funding market.

Very few empirical studies provide evidence on the competition-stability nexus in cooperative banking. Moreover, they not include the specific features related to their business model. As far as we are aware, Fiordelisi and Mare (2014) is the only study that investigates the sign of the relationship in five cooperative banking markets in Europe (Austria, France, Germany, Italy and Spain). The authors conclude that lower market power is associated with higher individual bank stability. Liu et al. (2013) focus on regional banking in Europe including cooperative banks and find, similarly to Martinez-Miera and Repullo (2010), a non-linear relationship between competition and stability. Other studies attempt to address the financial stability of cooperative banks and their contribution to the overall systemic stability. Hesse and Cihak (2007) advocate that cooperative banks are more stable than commercial banks. This is due to the lower variability of the cooperative banks' returns. Moreover, in line with the reasoning in Ayadi et al. (2010), Hesse and Cihak (2007) find that banking systems characterised by higher share of cooperative banks are more stable. Mercieca et al. (2007) analyse the benefits of income diversification in terms of banks' profitability. The authors investigate small European banks over the period 1997–2003 and find that there are no direct diversification benefits in terms of performance. Goddard et al. (2008) suggest that a diversification strategy brings positive effects depending on size. The authors analyse a sample of credit unions in the United States between 1993 and 2004 and show that diversification strategies are more effective for largest credit unions only and lead to higher returns unadjusted for risk. In contrast, Kohler (2014) finds that cooperative banks may benefit from income diversification becoming significantly sounder. In addition, the author advocates that retail-oriented credit institutions become less stable if they increase the share of non-deposit funding.

Our paper contributes to the existing literature in several ways. First, we apply a modified Lerner index measure that takes into account the specific business model orientation of cooperative banks. Second, we test for the significance of diversification captured in three dimensions: loans, deposits and liabilities. We find that all the three dimensions of diversification

are significantly related with the risk preferences of cooperative banks. Lastly, we show that market structure measures (e.g., Herfindahl-Hirschman Index) is not a significant determinant in explaining individual bank solvency.

3 Data sources and variables

Bank financial statements are taken from the Bureau van Dijk Bankscope database. We restrict our analysis to countries in the European Union where data is available for Cooperative banks over the period 1999 to 2013.[1] We classify banks according to Bankscope definition therefore including also credit institutions that resemble more joint-stock companies (as, for instance, the Italian Banche Popolari).

To avoid duplication, we consider unconsolidated data only. We also omit banks for which relevant information is not available (i.e., total assets and total equity). After data cleaning, our final sample consists of around 16,800 observations for 1,546 cooperative banks distributed in seventeen countries in the European Union. The sample is unbalanced and banks are mainly concentrated in four countries – Austria, Germany, Italy, and Spain -accounting for 5%, 71%, 19%, and 3% of the observations, respectively. Table 1 reports the cross-sectional time series description (Panel A) and key indicators (Panel B) for the cooperative banks in the different countries.

<< INSERT HERE TABLE 1 >>

We notice that in our sample France counts with the biggest cooperative banks in terms of assets whilst Denmark on average shows the smallest. Slovenia has on average the highest percentage of loans to total assets and on average cooperative banks in the 17 countries invest 60 per cent of the total assets in loans. Deposits are the biggest source of funding for cooperative

[1] The countries included in the analysis are Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, France, Germany, Greece, Italy, Luxembourg, Malta, Portugal, Romania, Slovenia and Spain.

banks though this is not the case in Italy where Banche Popolari use alternative sources of funding. On average, the leverage ratio computed as equity to total assets is 8 per cent denoting a high level of capitalization compared to recent regulatory proposals in the European Countries (as for instance, a maximum leverage ratio of 4.95 per cent in boom times proposed by the Bank of England in the UK). Interest income is the main source of revenues standing at almost 82 per cent of total income. Notice that our descriptive evidence is heavily influenced by the number of cooperative banks in each country.

A comprehensive set of variables is considered in the analysis to control for the effect of other factors on the relationship between risk and competition. We include variables such as diversification proxies, market concentration, and bank-specific variables that can directly affect the relationship between stability and competition. Below, we first describe the main variables of interest in our analysis - the Lerner Index and bank stability - and then the other variables we include in the estimation.

3.1 Measuring competition and market structure

We estimate competition using the Lerner Index of Monopoly Power (*LER*). This indicator represents the extent to which market power allows firms to earn relative margins (price minus marginal cost divided by the price). We explicitly recognise that the core products offered by cooperative banks are loans and deposits. We therefore investigate disjointedly the different patterns and determinants of the degree of non-competitive behaviour in the two separate markets. The specification is as follows:

$$\mathrm{LER}_{\mathrm{i,t}} = \frac{\mathrm{P}_{\mathrm{i,t}} - \mathrm{MC}_{\mathrm{i,t}}}{\mathrm{P}_{\mathrm{i,t}}} \qquad (1)$$

where $P_{i,t}$ is the price of the output of bank i at year t, and $MC_{i,t}$ is the marginal cost of producing one additional unit of output. Higher index values imply greater market power. We follow Maudos and de Guevara (2007) and estimate the cost function using two outputs (interest-bearing

assets and interest-bearing liabilities) to reflect the fact that cooperative banks offer mainly deposits and loans. We use a translog cost function to derive the marginal cost with two inputs and two outputs. The final specification is as follows:

$$\begin{aligned}\ln c_{i,t} &= \alpha_0 + \sum \gamma_h \ln \omega_{h,i,t} + \gamma_L \ln L_{i,t} + \gamma_D \ln D_{i,t} + \frac{1}{2}\sum\sum \gamma_{hm} \ln \omega_{h,i,t} \ln \omega_{m,i,t} \\ &+ \gamma_{LD} \ln L_{i,t} \ln D_{i,t} + \frac{1}{2}\gamma_{LL}(\ln L_{i,t})^2 + \frac{1}{2}\gamma_{DD}(\ln D_{i,t})^2 + \sum \gamma_{hL} \ln \omega_{h,i,t} \ln L_{i,t} \\ &+ \sum \gamma_{hD} \ln \omega_{h,i,t} \ln D_{i,t} + \mu_1 Trend + \frac{1}{2}\mu_2 Trend^2 + \mu_L Trend \ln L_{i,t} \\ &+ \mu_D Trend \ln D_{i,t} + \sum \mu_h Trend \ln \omega_{h,i,t} + \sum Country_c + \varepsilon_{i,t}\end{aligned} \tag{2}$$

where $c_{i,t}$ is the total non-interest expenses; L and D are two outputs (interest-bearing assets and interest-bearing liabilities, respectively); two input prices (w_1 = price of labour and w_2 = price of physical capital); *Trend* captures the technical change over time; *Country* are dichotomous variables that control for factors specific for each country; ε_{it} is the robust standard error term clustered at the individual bank level. Symmetry and linear homogeneity in input prices restrictions are imposed. Moreover, we rescale Equation (2) using the price of physical capital. Similarly to Fernandez de Guevara et al. (2005), we compute the marginal costs for loans and deposits using the following two equations:

$$MCl_{i,t} = \frac{\partial c_{i,t}}{\partial L_{i,t}} = \frac{c_{i,t}}{L_{i,t}}\left(\hat{\gamma}_L + \hat{\gamma}_{LL} \ln L_{i,t} + \hat{\gamma}_{hL} \ln \omega_{h,i,t} + \hat{\gamma}_{LD} \ln D_{i,t} + \hat{\mu}_L Trend\right) \tag{3}$$

$$MCd_{i,t} = \frac{\partial c_{i,t}}{\partial D_{i,t}} = \frac{c_{i,t}}{D_{i,t}}\left(\hat{\gamma}_D + \hat{\gamma}_{DD} \ln D_{i,t} + \hat{\gamma}_{hD} \ln \omega_{h,i,t} + \hat{\gamma}_{LD} \ln L_{i,t} + \hat{\mu}_D Trend\right) \tag{4}$$

$MCl_{i,t}$ and $MCd_{i,t}$ are obtained from equations (3) and (4) and then substituted into equations (1) to calculate the Lerner Indexes for bank *i* at time *t*, thereby giving us the dynamic change in market power across banks over time.

To check for the robustness of the results, we substitute the Lerner Index with a measure of market structure. We compute the Herfindahl-Hirschman Index (HHI) to reflect the influence of

concentration on the risk position of cooperative banks. We compute three separate measures for loans, customer deposits and assets. The indexes are calculated annually at the national level because of the lack of disaggregated information. A higher value of HHI indicates higher concentration in the market.

3.2 Measuring risk preferences

We employ different measures of risk in order to account for cooperative banks' risk preferences. Namely, we investigate bank solvency and the risk exposure via the risk-adjusted performance. We capture the risk preferences of cooperative banks by using the Z-index, the risk-adjusted return on assets and the risk-adjusted return on equity. The Z-index is an indicator of overall bank solvency that has been extensively used in banking studies (e.g., Beck et al., 2013; Fiordelisi and Mare, 2014). This measure gives an indication of the number of standard deviations by which returns have to diminish in order to deplete the equity of a bank. Following Lepetit and Strobel (2013), we compute the Z-Index as follows:

$$Z-index_{i,t} = \frac{\mu_{ROA,t} + CAR_{i,t}}{\sigma_{ROA,t}} \tag{5}$$

where the subscripts *i* and t denote the cross-sectional dimension (i.e., individual banks) and the time dimension (i.e., years); μ_{ROA} is the moving mean return on assets (ROA) estimate computed using the current and available past information on ROA[2] for each period $t \in \{1...T\}$; σ_{ROA} is the moving standard deviation of ROA computed using the current and available past information on ROA for each period $t \in \{1...T\}$. The Z-index is a measure of bank solvency. Higher values imply a higher degree of soundness.

[2] For instance, in order to compute the mean ROA for year 2001, the average ROA is computed over the period 1999-2001.

In order to gain a broader understanding on the risk preferences of cooperative banks, we employ in the analysis other measures. Following some banking studies (Mercieca et al., 2007; Turk Ariss, 2010) we compute:

$$\mathrm{ROR}_{\mathrm{ROA}} = \frac{\mu_{\mathrm{ROA}}}{\sigma_{\mathrm{ROA}}} \tag{6}$$

$$\mathrm{ROR}_{\mathrm{ROE}} = \frac{\mu_{\mathrm{ROE}}}{\sigma_{\mathrm{ROE}}} \tag{7}$$

where, $\mathrm{ROR}_{\mathrm{ROA}}$ and $\mathrm{ROR}_{\mathrm{ROE}}$ denote risk-adjusted return on assets and risk-adjusted return on equity, respectively. Contrarily to the Z-Index, higher values of the risk-adjusted performance measures indicate less bank stability.

3.3 Control variables

One of the objectives of our study is to investigate the role of asset and liabilities diversification in the explanation of cooperative banking stability. We focus on diversification in assets, in customer deposits, and in sources of funding. Following Berger et al. (2010), we compute three measures of bank diversification:

$$DIVASSET_{i,t} = \left(\frac{NET\ LOANS}{TOTAL\ ASSETS}\right)^2 + \left(\frac{BANK\ LOANS}{TOTAL\ ASSETS}\right)^2 + \left(\frac{TOTAL\ SECURITIES}{TOTAL\ ASSETS}\right)^2 + \left(\frac{LIQUID\ ASSETS}{TOTAL\ ASSETS}\right)^2 + \left(\frac{FIXED\ ASSETS}{TOTAL\ ASSETS}\right)^2 \tag{8}$$

$$DIVDEPO_{i,t} = \left(\frac{CURRENT\ DEPOSITS}{TOTAL\ DEPOSITS}\right)^2 + \left(\frac{TERM\ DEPOSITS}{TOTAL\ DEPOSITS}\right)^2 + \left(\frac{SAVINGS\ DEPOSITS}{TOTAL\ DEPOSITS}\right)^2 \tag{9}$$

$$DIVLIAB_{i,t} = \left(\frac{TOTAL\ DEPOSITS}{TOTAL\ LIABILITIES}\right)^2 + \left(\frac{BANK\ DEPOSITS}{TOTAL\ LIABILITIES}\right)^2 + \left(\frac{LG\ TERM\ FUNDING}{TOTAL\ LIABILITIES}\right)^2 + \left(\frac{OTHER\ LIABILITIES}{TOTAL\ LIABILITIES}\right)^2 + \left(\frac{TOTAL\ EQUITY}{TOTAL\ LIABILITIES}\right)^2 \tag{10}$$

We also incorporate in the main model a vector $\boldsymbol{X}$ of covariates that describe bank-specific characteristics the macroeconomic environment. The size variable is computed as the natural

logarithm of bank total assets and it captures bank's ability to diversify the business. The ratio of loan-loss provisions to total loans controls for the exposure to credit risk. The coverage ratio accounts for the level of solvency with regard to non-performing loans. It is computed as the sum of equity and loan reserves minus non-performing loans, rescaled by total assets. Moreover, we include a dummy variable for banks that are listed on an exchange taking value of 1 if the credit institution is listed, 0 otherwise. Lastly, we control for macroeconomic variables that are expected to influence the relationship between risk preferences and competition. These include the annual real GDP growth (*GDPG*) and the inflation rate (*INF*). A summary of the variables used for the empirical investigation is provided in Table 2. Table 3 reports the descriptive statistics for the main variables of interest for the aggregate sample over the observed time period.

<< INSERT HERE TABLE 2 >>

<< INSERT HERE TABLE 3 >>

4 Empirical approach

We specify the following model to investigate the relationship between solvency risk, market power and diversification in cooperative banking:

$$Risk_{i,t} = f(Competition_{i,t}, Diversification_{i,t,}, X_{i,c,t}), \tag{11}$$

where the subscripts i ,c and t denote the individual banks, the individual countries and the time dimension, respectively. In line with previous studies (for instance, Beck et al., 2013), we analyse the economic causality using panel fixed-effects techniques. We specify the following relationship:

$$Risk_{i,t} = \alpha_i + \beta_1 Comp_{i,t} + \beta_2 Comp_{i,t}^2 + \sum_{j=1}^{3} w_j Div_{i,t}^j + \sum_{j=1}^{5} \delta_j X_{i,t}^j + \sum_{j=1}^{2} \delta_j M_{c,t}^j + \gamma_t + \varepsilon_{i,t}, \tag{12}$$

where *Risk* are the risk measures, namely the Z-index, the risk-adjusted return on assets, the risk-adjusted return on equity: *Comp* are the Lerner Index and the HHI for assets, loans and

deposits; *Div* are the three diversification measures: diversification in assets, diversification in customer deposits and diversification in sources of funding; *X* is the vector of bank-level fundamentals, namely the size, the level of provisioning, financial leverage and the categorical variable for listed institutions; *M* are the real GDP growth and the inflation rate; γ are year fixed-effects; α is the time-invariant random component of the error; ε indicates robust standard errors clustered at the individual bank level.

5 Results

Table 4 and table 5 show the evolution of the Marginal cost and Lerner index of market power for each of the EU countries, and for the EU average. As we can see from table 4 Panel A, the estimated marginal costs of loans for the whole sample are greater in 2013 than in 1999. Also, we notice that in 2008 on average cooperative banks have the highest unit costs for granting loans. The marginal costs for deposits are lower in 2013 than 1999 reflecting the lower interest rate environment following the loose monetary policy stance initiated by the European Central Bank in October 2008.

<< INSERT HERE TABLE 4 >>

Looking at the table 5, the time-series development of the Lerner Index denotes a negative value in 2013 mainly driven by the extreme negative average value of Denmark. In the other countries, apart from Austria and Croatia, we observe a positive mark-up meaning that cooperative banks are able to exert a certain degree of monopoly power. We also notice that on average market power has reduced over the period 1999-2013.

<< INSERT HERE TABLE 5 >>

The next stage is to estimate a panel fixed effects model in order to examine the relationship between competition (measured by *LER* and *HHI*) and cooperative banks' risk (measured by *Z*-

score, ROR_{ROA} and ROR_{ROE})[3] while controlling for diversification, bank-level fundamentals and macro variables. We report the results derived from the estimation of Equation (12) in Table 6.

<< INSERT HERE TABLE 6 >>

Our main variables of interest are the Lerner index, the market structure and the diversification measures. Contrary to Fiordelisi and Mare (2014), we find that market power is positively related to bank stability and that the speed of adjustment is also positive and significant. We ascribe this difference at the introduction of the diversification measures as determinants. When cooperative banks have access to asset diversification in conjunction also with a bigger size of their operations, they increase the individual resilience due to higher margins (Martinez-Miera, and, 2010). This is also true if cooperative banks strike the right balance in the diversification of their liabilities. On the other hand, competition in the market for deposits may force cooperative banks to diversify their core deposit products (i.e., into current, savings and term) but this is associated with an increase in bank instability. In addition we find that market structure measures (e.g., Herfindahl-Hirschman Index) are not significantly related to individual bank solvency.

5.1 Robustness checks

In order to further confirm the aforementioned findings, we conduct some additional robustness checks. We recognise that some countries dominate the sample and investigate whether this feature can affect the robustness of our results.

We first exclude Germany and find that the Lerner Index keeps being highly statistically significant. In addition, the diversification measures keep being highly significant reinforcing our reasoning regarding the importance of including asset and liabilities diversification in the analysis. Table 7 shows the results of this analysis that support our main findings.

[3] For the sake of space, we do not report in the paper the results for the risk-adjusted performance measures. Results are available from the authors upon request.

<< INSERT HERE TABLE 7 >>

We also restrict our sample to the five countries where the sample number of banks is greater. The results, reported in Table 8, are qualitatively similar to the pervious estimations further reinforcing the fact that we our results are not geographically dependent.

<< INSERT HERE TABLE 8 >>

6 Conclusions

Cooperative banks are key credit institutions for the sustainable development of local economies. Despite their importance, few studies have assessed the relationship between competition and the individual financial stability of European cooperative banks. Moreover, there are specific features that should be taken into consideration.

Our paper empirically advances the literature by analysing a large sample of cooperative banks in the European Union between 1999 and 2013. We uncover new evidence on the competition-stability nexus in cooperative banking. We find that market power increases individual bank soundness and that assets diversification and liabilities diversification increase individual bank stability. Competition in the deposit market decreases individual bank soundness. Lastly, we show that market structure measures (e.g., Herfindahl-Hirschman Index) is not a significant determinant in explaining individual bank solvency.

References

Anginer, D., Demirgüç-Kunt, A., Zhu, M., 2012. How does bank competition affect systemic stability?. *World Bank Policy Research, Working Paper 5981*, World Bank, Washington D.C.

Ayadi, R., Llewellyn, D. T., Schmidt, R. H., Arbak, E., De Groen, W. P., 2010. Investigating Diversity in the Banking Sector in Europe: Key Developments, Performance and Role of Cooperative Banks. CEPS Paperbacks. September 2010.

Beck, T., De Jonghe, O., Schepens, G., 2013. Bank competition and stability: Cross-country heterogeneity. *Journal of Financial Intermediation 22(2)*, 218–244.

Berger, A. N., Hasan, I., Zhou, M., 2010. The effects of focus versus diversification on bank performance: Evidence from Chinese banks. *Journal of Banking & Finance 34(7)*, 1417-1435.

Boyd, J. H., De Nicolò, G., 2005. The theory of bank risk taking and competition revisited. *Journal of Finance 60(3)*, 1329-1343.

De Nicolò, G., Lucchetta M., 2009. Financial intermediation, competition, and risk: a general equilibrium exposition. *IMF Working Paper 105*, International Monetary Fund, Washington, D.C.

Fernandez de Guevara, J., Maudos, J., Perez, F., 2005. Market power in European banking sectors. *Journal of Financial Services Research 27(2)*, 109-137.

Ferri, G., Kalmi, P., Kerola, E., 2014. Does bank ownership affect lending behavior? Evidence from the Euro area. *Journal of Banking & Finance 48*, 194–209.

Fiordelisi, F., Mare, D. S., 2014. Competition and financial stability in European cooperative banks. *Journal of International Money and Finance 45*, 1-16.

Fonteyne, W., 2007. Cooperative banks in Europe: policy issues. *IMF Working Paper 159*, International Monetary Fund, Washington, D.C.

Goddard, J., McKillop, D., Wilson, J.O.S., 2008. The diversification and financial performance of US credit unions. *Journal of Banking & Finance 32*(9), 1836-1849.

Groeneveld, H., Llewellyn, D., 2012. Corporate governance in cooperative banks. Raiffeisen's Footprint: the co-operative way of banking.

Hakenes, H., Hasan, I., Molyneux, P., Xie, R., 2014. Small banks and local economic development. *Forthcoming Review of Finance*

Hesse, H., Cihák, M., 2007. Cooperative Banks and Financial Stability. *IMF Working Papers 2*, International Monetary Fund, Washington D.C.

Kalmi, P., 2007. The disappearance of cooperatives from economics textbooks. *Cambridge Journal of Economics 31(4)*, 625-647.

Keeley, M. C., 1990. Deposit insurance, risk, and market power in banking. *The American Economic Review*, 1183-1200.

Köhler, M., 2014. Which banks are more risky? The impact of business models on bank stability. *Forthcoming Journal of Financial Stability*.

Lepetit, L., Strobel, F., 2013. Bank insolvency risk and time-varying Z-score measures. *Journal of International Financial Markets, Institutions & Money 25*, 73-87.

Liu, H., Molyneux, P., Wilson, J.O.S., 2013. Competition and stability in European banking: A regional analysis. *The Manchester School 81(2)*, 176-201.

Marcus, A,J, 1984. Deregulation and bank financial policy. Journal of Banking & Finance 8(4), 557-565.

Martinez-Miera, D., Repullo, R., 2010. Does competition reduce the risk of bank failure? *Review Financial Studies 23(10)*, 3638-3664.

Maudos, J., Fernandez de Guevara, J., 2007. The cost of market power in banking: Social welfare loss vs. cost inefficiency. *Journal of Banking & Finance*, 31(7), 2103 -2125.

Mercieca, S., Schaeck, K., Wolfe, S., 2007. Small European banks: Benefits from diversification? *Journal of Banking & Finance 31(7)*, 1975-1998.

Turk Ariss, R., 2010. On the implications of market power in banking: Evidence from developing countries. *Journal of Banking & Finance*, 34(4), 765-775.

Table 1

Panel A: Distribution of banks by country and calendar year

This table presents the distribution of Cooperative banks by country and year over the sample period (1999-2013). Note the lower frequency of the sample data over the period 1999-2004. Moreover, there are three countries (Austria, Italy and Germany) that dominate the sample (95%). Source: data from Bankscope after data cleansing.

Country	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**Total**
Austria	24	22	35	39	44	73	59	91	93	74	70	70	69	65	59	887
Belgium	6	6	6	6	6	6	4	5	3	5	5	5	5	4	4	76
Bulgaria	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14
Croatia	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	13
Cyprus	0	0	1	1	1	2	2	2	2	2	2	2	2	2	0	21
Czech Republic	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	7
Denmark	0	0	0	0	1	1	1	2	2	2	5	5	5	5	6	35
France	9	9	10	8	9	11	6	9	8	9	9	9	8	9	9	132
Germany	698	588	651	668	634	637	662	910	916	928	927	931	936	943	846	11,875
Greece	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	5
Italy	0	0	0	0	0	0	246	347	373	385	384	385	390	387	366	3,263
Luxembourg	1	0	1	1	1	1	0	1	1	1	1	1	1	1	0	12
Malta	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	13
Portugal	0	0	1	1	0	0	0	0	0	0	1	1	0	1	1	6
Romania	0	0	0	0	0	0	1	1	1	1	1	0	1	0	0	6
Slovenia	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	7
Spain	0	0	0	0	0	0	53	46	46	54	54	54	52	54	24	437
Total	739	628	708	727	699	734	1,036	1,418	1,451	1,467	1,465	1,468	1,473	1,476	1,320	16,809

Table 1 continued

Panel B: Key indicators cooperative banking sector

This table presents the average country values of key descriptive indicators for cooperative banks. Total assets are in thousand dollars. Net loans, deposits, short-term liabilities, equities and net operating income are expressed in percentage of total assets. The interest income and the personnel expenses are expressed in percentage of total income. Source: own calculation using data from Bankscope.

Country	Assets	Loans	Deposits	Short-term liabilities	Equity	Net operating income	Interest income	Personnel Expenses
Austria	800,851	57.3%	68.9%	87.9%	7.3%	0.5%	76.8%	35.5%
Belgium	1,211,375	47.3%	72.7%	75.9%	15.5%	1.3%	87.5%	21.1%
Bulgaria	1,025,440	47.1%	79.6%	84.0%	11.8%	1.0%	66.0%	25.6%
Croatia	278,547	52.9%	66.9%	73.9%	9.3%	-1.2%	81.2%	39.2%
Cyprus	2,672,851	49.4%	80.0%	89.0%	4.8%	1.0%	88.8%	10.5%
Czech Republic	2,723,683	78.9%	59.8%	80.4%	10.2%	0.7%	84.4%	23.8%
Denmark	122,209	55.5%	79.3%	81.8%	15.7%	-0.4%	94.3%	67.8%
France	6,009,802	61.6%	55.6%	85.8%	7.4%	0.6%	80.3%	26.0%
Germany	747,046	59.2%	75.0%	88.6%	6.6%	0.7%	81.1%	33.4%
Greece	2,530,924	76.1%	79.1%	86.4%	10.1%	1.4%	90.9%	11.2%
Italy	741,321	65.2%	51.1%	60.1%	11.9%	0.6%	83.0%	42.7%
Luxembourg	306,347	40.3%	92.9%	94.8%	4.0%	0.4%	94.3%	19.8%
Malta	874,545	64.0%	3.5%	66.6%	29.0%	0.6%	97.1%	4.5%
Portugal	396,152	46.5%	87.7%	87.7%	10.8%	1.0%	95.7%	19.6%
Romania	293,754	53.5%	35.7%	65.9%	24.3%	-1.4%	61.8%	35.3%
Slovenia	1,397,634	81.5%	36.7%	88.6%	7.8%	0.2%	91.3%	19.8%
Spain	765,227	67.0%	80.2%	87.5%	10.2%	0.6%	89.9%	24.0%
Total	794,770	60.4%	70.0%	82.9%	7.9%	0.6%	81.6%	34.9%

Table 2

Variables definition

This table reports the name, symbol and definition of the variables employed in the analysis. The source of data is Bureau van Dijk Bankscope and the World Bank.

Variables	Symbol	Definition and calculation method
Risk measures		
Z-Index	ZINDEX	It is built as the sum of bank's average return on assets (ROA) and bank's average equity ratio (equity over total assets) divided by the standard deviation of ROA computed for each bank per year.
Risk-adjusted ROA	ROR_{ROA}	Following Turk-Arris (2010), it is built as the bank's average return on assets (ROA) divided by the bank's standard deviation of ROA .
Risk-adjusted ROE	ROR_{ROE}	Following Turk-Arris (2010), it is built as the bank's average return on equity (ROE) divided by the bank's standard deviation of ROE.
Market power and market structure		
Lerner Index	LER	It represents the extent to which market power allows the bank to fix a price (P) above its marginal cost (MC).
Concentration Loans	HHI LOANS	Concentration Index (Herfindahl–Hirschman Index) calculated as the sum of the squares of the market shares (considering loans) of each bank (i) in a specific country (c) in a determined year (t). We consider one observation per year (t) per country (c) (i.e. 285 values).
Concentration Customer Deposits	HHI DEP	Concentration Index (Herfindahl–Hirschman Index) calculated as the sum of the squares of the market shares (considering total customer deposits) of each bank (i) in a specific country (c) in a determined year (t). We consider one observation per year (t) per country (c) (i.e. 285 values).
Concentration Assets	HHI ASSET	Concentration Index (Herfindahl–Hirschman Index) calculated as the sum of the squares of the market shares (considering total assets) of each bank (i) in a specific country (c) in a determined year (t). We consider one observation per year (t) per country (c) (i.e. 285 values).
Diversification measures		
Asset diversification	DIVASSET	It is built as the sum of the percentage squares (with respect to total assets) of net loans, loans and advances to banks, total securities, cash and due from banks and fixed assets. The ratio is computed per each bank in each year.
Deposit diversification	DIVDEPO	It is built as the sum of the percentage squares (with respect to to total deposits) of customer deposits current, savings and term. The ratio is computed per each bank in each year.
Liabilities diversification	DIVLIAB	It is built as the sum of the percentage squares (with respect to to total liabilities) of total customer deposits, deposits from banks, total long term funding, other liabilities and total equity. The ratio is computed per each bank in each year.
Control variables		
Size	ln_TOTA	It is built as the natural logarithm of total assets.
Credit risk ratio	LLPTL	It is built as loan loss provision to total loans.
Financial leverage	FL	It is built as total liabilities to total equity.
Listed	LISTED	It is a dummy variable that takes value of 1 if the bank is listed on an exchange, 0 otherwise.
Coverage ratio	COVRATIO	It is built as the sum of equity and loan reserves minus non-performing loans, all divided by total assets.
GDP growth	GDPGrowth	Annual percentage growth rate of GDP at market prices based on constant local currency.
Inflation rate	INFL	It is the annual percentage change in the consumer price index.

Table 3

Summary statistics

This table presents the descriptive statistics of our sample of cooperative banks in the European banking system between 1999 and 2013 for the main variables used in the model.

Variable	Symbol	Obs	Mean	Std. Dev.
Z-Index	ZINDEX	16,809	111.708	213.564
Risk-adjusted ROA	ROR_{ROA}	16,809	0.148	3.073
Risk-adjusted ROE	ROR_{ROE}	16,809	4.556	9.068
Lerner Index	LER	16,771	5.675	92.827
Concentration Loans	HHI LOANS	16,809	0.023	0.081
Concentration Customer Deposits	HHI DEP	16,809	0.022	0.084
Concentration Assets	HHI ASSET	16,809	0.024	0.081
Asset diversification	DIVASSET	16,809	0.471	0.097
Deposit diversification	DIVDEPO	16,809	0.528	0.234
Liabilities diversification	DIVLIAB	16,809	0.558	0.131
Size	ln_TOTA	16,809	12.899	1.114
Credit risk ratio	LLPTL	16,809	0.006	0.023
Financial leverage	FL	16,809	13.682	5.444
Listed	LISTED	16,809	0.001	0.032
Coverage ratio	COVRATIO	16,809	0.080	0.044

Table 4

Panel A: Marginal cost for loans

This table presents the marginal cost to produce one additional unit of loans and deposits computed using equations (3) and (4). for descriptive statistics of our sample of cooperative banks in the European banking system between 1999 and 2013 for the main variables used in the model.

Country	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Austria	0.017	0.019	0.020	0.020	0.017	0.017	0.018	0.020	0.025	0.027	0.020	0.018	0.021	0.021	0.021
Belgium	0.007	-0.005	0.003	0.010	-0.005	0.012	0.011	0.016	0.021	0.048	0.025	0.030	0.033	0.031	0.034
Bulgaria	.	0.062	0.039	0.053	0.051	0.038	0.020	0.025	0.029	0.031	0.043	0.022	0.027	0.018	0.019
Croatia	-0.004	0.143	0.073	0.070	0.066	0.046	0.051	0.058	0.061	0.067	0.074	.	.	0.032	0.030
Cyprus	.	.	0.273	0.262	0.240	0.058	0.039	-0.005	0.041	0.046	0.021	0.026	0.026	0.020	.
Czech Republic	.	.	.	.	.	.	.	.	0.026	0.029	0.029	0.025	0.021	0.019	0.018
Denmark	.	.	.	.	0.027	0.034	0.032	0.027	0.037	0.039	0.038	0.031	0.033	0.031	0.100
France	0.016	0.018	0.020	0.021	0.023	0.021	0.016	0.023	0.021	0.030	0.030	0.026	0.029	0.028	0.026
Germany	0.018	0.022	0.022	0.021	0.020	0.020	0.021	0.022	0.025	0.026	0.020	0.019	0.028	0.022	0.018
Greece	.	.	.	.	.	.	.	0.024	0.026	0.034	0.026	0.028	.	.	.
Italy	.	.	.	.	.	.	0.045	0.047	0.055	0.117	0.091	0.085	0.094	0.104	0.098
Luxembourg	0.015	.	0.024	0.019	0.012	0.012	.	0.015	0.021	0.024	0.013	0.011	0.012	0.016	.
Malta	.	0.017	0.013	0.010	0.013	0.019	.	0.025	0.027	0.031	0.021	0.014	0.018	0.021	0.091
Portugal	.	.	0.021	0.022	.	.	.	.	.	.	0.024	0.019	.	0.033	0.022
Romania	.	.	.	.	.	.	0.126	0.086	0.060	0.064	0.091	.	0.195	.	.
Slovenia	.	.	.	.	.	.	.	.	0.029	0.033	0.020	0.019	0.022	0.017	0.018
Spain	.	.	.	.	.	.	0.019	0.019	0.024	0.033	0.026	0.022	0.022	0.025	0.019
Total	0.018	0.022	0.022	0.022	0.020	0.020	0.027	0.028	0.033	0.050	0.039	0.036	0.045	0.044	0.041

Table 4 continued

Panel B: Marginal costs for deposits

Country	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Austria	0.044	0.045	0.042	0.037	0.032	0.031	0.028	0.029	0.033	0.036	0.028	0.021	0.020	0.018	0.016
Belgium	0.040	0.043	0.043	0.040	0.046	0.031	0.034	0.029	0.030	-0.127	-0.007	-0.007	-0.038	-0.030	-0.062
Bulgaria	.	0.110	0.132	0.085	0.062	0.050	0.074	0.066	0.061	0.077	0.081	0.078	0.065	0.073	0.060
Croatia	-0.013	0.108	0.078	0.073	0.063	0.076	0.071	0.054	0.045	0.035	0.040	.	.	0.052	0.043
Cyprus	.	.	0.371	0.381	0.366	0.171	0.144	0.079	0.076	0.074	0.052	0.054	0.049	0.052	.
Czech Republic	.	.	.	.	.	.	.	.	0.019	0.023	0.024	0.020	0.018	0.018	0.018
Denmark	.	.	.	.	0.041	0.036	0.028	0.029	0.033	0.032	0.027	0.029	0.028	0.027	0.038
France	0.061	0.062	0.058	0.054	0.047	0.044	0.033	0.044	0.049	0.046	0.040	0.033	0.026	0.022	0.020
Germany	0.053	0.053	0.051	0.048	0.047	0.043	0.040	0.039	0.038	0.038	0.036	0.031	-0.006	0.015	0.024
Greece	.	.	.	.	.	.	.	0.028	0.031	0.035	0.027	0.026	.	.	.
Italy	.	.	.	.	.	.	0.010	0.008	0.004	-0.018	-0.019	-0.025	-0.105	-0.034	-0.074
Luxembourg	0.020	.	0.024	0.019	0.013	0.013	.	0.013	0.017	0.018	0.010	0.007	0.009	0.010	.
Malta	.	0.013	0.013	0.010	0.013	0.016	.	0.017	0.022	0.022	0.013	0.007	0.007	0.002	-0.533
Portugal	.	.	0.026	0.023	.	.	.	.	.	.	0.016	0.011	.	0.028	0.031
Romania	.	.	.	.	.	.	0.034	0.060	0.034	0.060	0.018	.	0.547	.	.
Slovenia	.	.	.	.	.	.	.	.	0.026	0.027	0.019	0.016	0.021	0.019	0.019
Spain	.	.	.	.	.	.	0.015	0.016	0.019	0.014	0.018	0.015	0.017	0.019	0.014
Total	0.052	0.053	0.051	0.048	0.046	0.042	0.031	0.030	0.028	0.022	0.020	0.015	-0.030	0.003	-0.004

Table 5

Lerner Index

Country	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Austria	0.240	0.327	0.257	0.183	0.135	0.115	0.124	0.184	0.287	0.359	0.194	0.046	0.081	0.004	-0.103
Belgium	0.644	0.737	0.674	0.619	0.621	0.601	0.556	0.587	0.521	1.961	0.688	0.580	0.620	0.713	0.805
Bulgaria	.	-0.264	-0.102	-0.426	-0.327	-0.079	0.021	0.048	0.031	-0.001	0.103	0.201	0.212	0.221	0.169
Croatia	2.434	-0.927	-0.167	-0.241	-0.087	-0.059	-0.388	-0.451	-0.207	-0.104	-0.151	.	.	-0.158	-0.019
Cyprus	.	.	0.538	0.509	0.588	0.697	0.723	0.741	0.680	0.668	0.697	0.550	0.609	0.641	.
Czech Republic	.	.	.	.	.	.	.	.	0.162	0.347	0.246	0.140	0.227	0.198	0.102
Denmark	.	.	.	.	-0.105	-0.236	-0.210	0.154	0.029	-0.171	-0.073	-0.125	-0.268	-0.040	-66.292
France	0.246	0.296	0.303	0.343	0.241	0.239	0.261	0.263	0.343	0.248	0.323	0.295	0.274	0.222	0.209
Germany	0.253	0.215	0.231	0.210	0.175	0.149	0.125	0.173	0.173	0.226	0.200	0.174	0.169	0.146	0.091
Greece	.	.	.	.	.	.	.	0.573	0.642	0.683	0.612	0.562	.	.	.
Italy	.	.	.	.	.	.	0.007	0.138	0.243	0.292	0.101	-0.026	0.010	0.148	0.150
Luxembourg	0.563	.	0.643	0.542	0.463	0.378	.	0.433	0.594	0.482	0.239	0.241	0.235	0.180	.
Malta	.	0.813	0.860	0.832	0.804	0.807	.	0.849	0.881	0.871	0.770	0.670	0.676	0.583	4.355
Portugal	.	.	0.468	0.429	.	.	.	.	.	.	0.396	0.271	.	0.174	0.295
Romania	.	.	.	.	.	.	-0.036	-0.137	-0.205	0.070	0.027	.	-0.566	.	.
Slovenia	.	.	.	.	.	.	.	.	0.291	0.472	0.285	0.300	0.315	0.368	0.300
Spain	.	.	.	.	.	.	0.122	0.216	0.343	0.436	0.285	0.160	0.249	0.014	0.218
Total	0.259	0.224	0.238	0.214	0.177	0.152	0.099	0.170	0.207	0.264	0.180	0.117	0.127	0.138	-0.194

Table 6

Estimation results for bank solvency

This table reports the results from the estimation of Equation (12). We use a panel fixed effects model with robust standard errors clustered at the individual bank level. The sample includes all the European banks in EU17 over the period 1999-2013. The symbols *, **, and *** represent significance levels at the 10%, 5% and 1% level respectively. Standard errors appear in parentheses.

	(1)	(2)	(3)	(4)
VARIABLES	y=lnZ	y=lnZ	y=lnZ	y=lnZ
Lerner	0.224***			
	(0.044)			
Lerner SQ	0.001***			
	(0.000)			
Concentration Loans		-0.031		
		(0.410)		
Concentration Loans SQ		0.149		
		(0.463)		
Concentration Deposits			-0.291	
			(0.403)	
Concentration Deposits SQ			0.658	
			(0.472)	
Concentration Assets				-0.744*
				(0.402)
Concentration Assets SQ				0.853*
				(0.453)
Asset diversification	0.475***		-0.460***	
	(0.101)		(0.099)	
Deposit diversification	-1.660***	-1.613***		-1.595***
	(0.063)	(0.063)		(0.063)
Liabilities diversification	1.777***	1.698***		1.717***
	(0.089)	(0.086)		(0.085)
Size	0.125***	0.135***	0.080***	0.138***
	(0.009)	(0.009)	(0.009)	(0.009)
Credit risk ratio	-1.747*	-1.840*	-1.603	-1.876*
	(1.041)	(1.063)	(1.205)	(1.056)
Financial leverage	-0.023***	-0.023***	-0.012***	-0.023***
	(0.003)	(0.003)	(0.004)	(0.003)
Listed	-0.581	-0.643	-0.262	-0.704*
	(0.454)	(0.431)	(0.530)	(0.423)
Coverage ratio	0.396	0.224	-2.426***	0.285
	(0.428)	(0.428)	(0.602)	(0.424)
GDP growth	-0.267***	-0.266***	-0.020	-0.262***
	(0.015)	(0.016)	(0.015)	(0.016)
Inflation	-0.434***	-0.438***	-0.765***	-0.425***
	(0.039)	(0.040)	(0.047)	(0.040)
Constant	-3.901***	-3.703***	-2.870***	-3.760***
	(0.159)	(0.148)	(0.158)	(0.148)
Time fixed-effects	YES	YES	YES	YES
Observations	16,809	16,809	16,809	16,809
R-squared	0.683	0.681	0.652	0.681

Table 7

Estimation results for bank solvency excluding Germany

This table reports the results from the estimation of Equation (12). We use a panel fixed effects model with robust standard errors clustered at the individual bank level. The sample includes all the European banks in EU17 over the period 1999-2013. The symbols *, **, and *** represent significance levels at the 10%, 5% and 1% level respectively. Standard errors appear in parentheses.

	(1)	(2)	(3)	(4)
VARIABLES	y=lnZ	y=lnZ	y=lnZ	y=lnZ
Lerner	0.284***			
	(0.069)			
Lerner SQ	0.001***			
	(0.000)			
Concentration Loans		1.292**		
		(0.571)		
Concentration Loans SQ		-1.729***		
		(0.589)		
Concentration Deposits			2.625***	
			(0.526)	
Concentration Deposits SQ			-3.041***	
			(0.566)	
Concentration Assets				1.316**
				(0.627)
Concentration Assets SQ				-1.760***
				(0.636)
Asset diversification	0.551***		0.281**	
	(0.143)		(0.136)	
Deposit diversification	-0.696***	-0.657***		-0.646***
	(0.105)	(0.105)		(0.106)
Liabilities diversification	1.038***	0.857***		0.868***
	(0.118)	(0.133)		(0.133)
Size	0.174***	0.206***	0.169***	0.208***
	(0.015)	(0.015)	(0.014)	(0.015)
Credit risk ratio	-1.216	-1.194	-0.929	-1.207
	(0.757)	(0.746)	(0.697)	(0.748)
Financial leverage	-0.031***	-0.032***	-0.026***	-0.032***
	(0.007)	(0.007)	(0.005)	(0.007)
Listed	-1.760***	-1.602***	-1.508***	-1.597***
	(0.370)	(0.393)	(0.401)	(0.393)
Coverage ratio	1.773***	1.623***	1.617***	1.672***
	(0.536)	(0.533)	(0.509)	(0.538)
GDP growth	-0.072***	-0.072***	0.022	-0.073***
	(0.019)	(0.020)	(0.019)	(0.020)
Inflation	-0.077**	-0.023	-0.030	-0.019
	(0.038)	(0.038)	(0.039)	(0.038)
Constant	-4.806***	-4.905***	-5.030***	-4.962***
	(0.265)	(0.265)	(0.233)	(0.267)
Time fixed-effects	YES	YES	YES	YES
Observations	4,934	4,934	4,934	4,934
R-squared	0.697	0.693	0.687	0.693

Table 8

Estimation results for bank solvency including Austria, France, Germany, Italy and Spain

This table reports the results from the estimation of Equation (12). We use a panel fixed effects model with robust standard errors clustered at the individual bank level. The sample includes all the European banks in EU17 over the period 1999-2013. The symbols *, **, and *** represent significance levels at the 10%, 5% and 1% level respectively. Standard errors appear in parentheses.

VARIABLES	(1) y=lnZ	(2) y=lnZ	(3) y=lnZ	(4) y=lnZ
Lerner	0.249***			
	(0.043)			
Lerner SQ	-0.016			
	(0.016)			
Concentration Loans		0.072		
		(1.315)		
Concentration Loans SQ		15.910**		
		(6.304)		
Concentration Deposits			-4.366***	
			(1.063)	
Concentration Deposits SQ			28.176***	
			(4.517)	
Concentration Assets				-5.655***
				(1.108)
Concentration Assets SQ				43.034***
				(5.628)
Asset diversification	0.534***		-0.470***	
	(0.101)		(0.100)	
Deposit diversification	-1.655***	-1.633***		-1.554***
	(0.061)	(0.066)		(0.065)
Liabilities diversification	1.930***	1.807***		1.870***
	(0.090)	(0.087)		(0.086)
Size	0.127***	0.126***	0.065***	0.127***
	(0.009)	(0.009)	(0.009)	(0.009)
Credit risk ratio	-1.655	-1.356	-1.105	-1.213
	(1.022)	(1.047)	(1.217)	(0.987)
Financial leverage	-0.022***	-0.023***	-0.010**	-0.024***
	(0.003)	(0.003)	(0.004)	(0.003)
Listed	-2.277***	-1.812***	-1.881**	-1.794***
	(0.420)	(0.297)	(0.781)	(0.322)
Coverage ratio	0.770*	0.395	-2.270***	0.203
	(0.435)	(0.430)	(0.720)	(0.432)
GDP growth	-0.304***	-0.310***	-0.035**	-0.295***
	(0.016)	(0.017)	(0.015)	(0.017)
Inflation	-0.560***	-0.578***	-0.884***	-0.504***
	(0.041)	(0.041)	(0.044)	(0.042)
Constant	-3.946***	-3.519***	-2.631***	-3.607***
	(0.163)	(0.150)	(0.174)	(0.150)
Time fixed-effects	YES	YES	YES	YES
Observations	16,594	16,594	16,594	16,594
R-squared	0.686	0.686	0.657	0.686