Macroeconomic Shocks' Responses of Small and Large Banks in the Bank-Based Countries?

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Abstract
Banking institutions play a really important role in the process of providing credit to economic agents and are responsible for recovery after the financial crisis in the Europe. The objective of the paper is to identify the link between the European bank lending activities, main macroeconomic shocks, and institutional variables in the sample of EU-27 countries within the period 1998 – 2013. To increase macroeconomic implications we removed possible market based economies in final results. In addition, we distinguish between large and small banks in the sample. The microeconomic data are provided by the Bankscope database, macroeconomic shocks and institutional data are drawn from Eurostat on-line database. We employ robust OLS estimator to identify the main determinants of bank lending activities. The results confirm significant impact of macroeconomic shocks, banking controls and institutional variables on European lending activity. Not surprisingly, the impact of monetary policy interest rates is debatable; this variable proved to be non-significant in all models. Instead, central bank financial assets played an important role in the process of bank lending activities.

Keywords: banking industry, macroeconomic shocks, institutional variables, financial crisis, credit crunch
JEL codes: G2, C1

1. Introduction

Generally, banking institutions (in a bank-based financial system) and financial markets (in a market-based financial system) are considered to be the most important source of liquidity. Lending activities tend to increase during the phase of economic expansion and decrease during contractions, i.e. they are pro-cyclical. During and after the financial crisis in 2007 and 2008, markets faced the fall down of lending activities as a result of a drop in investment demand and economic activities (Poměnková and Kapounek, 2013). Gambacorta et al. (2014) find that bank-based systems and market-based systems foster economic growth in a complementary way. However, when it comes to moderating business cycle fluctuations, both systems are different. The shock-absorbing function of bank-based systems during normal times is limited when the economic downturn coincides with a financial crisis; the impact on the level of the real GDP has been three times as severe for bank-based systems compared to market-based systems. Mavrotas and Vinogradov (2007) and Allard and Blavy (2011) study the speed of economic recovery after the crisis in both the bank-based and market-based systems using a sample of advanced economies and conclude that market-based economies recover faster than the bank-based ones. The lending activities are not influenced only by demand side factors. Cuaresma et al. (2014) state that supply factors play a more significant role than the demand factors. Adams-Kane et al. (2015) contribute to the discussion and state that important bank lending determinants could be interpreted as changes in the

willingness of banks to lend as a result of increased economic uncertainty, worse funding availability of liquidity in interbank markets, and solvency from weakened balance sheets after the crisis.

The objective of the paper is to identify the link between the European bank lending activities, banking controls and main macroeconomic shocks and institutional variables in the sample of EU countries within the period 1998–2013. Moreover, we distinguish between the bank-based and market based economies. Despite the wide discussions concerning lending activities sources, most of the European economies are considered to be bank-based economies, i.e. they rely on bank credits and bank intermediation of savings compared to the United States and the rest of the world. We apply panel regressions where macroeconomic shocks are interacted with dummy variables and present results with different shares of market capitalization to domestic credit to private sector provided by banks in the EU countries.

The structure of the paper is as follows. The first section is introduction. The second section describes data and methods used in our paper. In the third section, results are presented. The fourth section brings conclusion.

2. Literature Review

There are several studies considering the impact of selected macroeconomic, banking and institutional variables on bank lending activities in the context of the type of the financial system.

Some authors use macroeconomic data to examine the impact of the type of the financial system on lending activity and selected macroeconomic variables. Chakraborty and Ray (2006) study financial systems in a theoretical endogenous growth model. They state that the level of *per capita* GDP and investments is higher and income inequality is lower under the bank-based system compared to the market-based system. The main reason is that banks monitor their clients and this procedure helps to solve agency problems and enables households and firms to borrow more. In other words, bank-based systems are connected with a higher level of lending activity. In the market-based systems, the situation is slightly different and financial markets intermediate a lower amount of external finance to all economic agents compared to the bank-based system. Using various indicators of financial development, Sahoo (2014) evaluates the role of financial intermediation in the economic development of India where both the bank-based and market-based intermediation processes have undergone remarkable improvements (particularly in the last six decades). The author concludes that the intermediation through the bank-based system is more important than through the market-based system in the process of the support of India's real GDP growth. The financial sector in India is mainly bank-centric and there is a scope for the expansion of credit disbursement. Therefore, the role of the banking sector is substantial as far as the intermediation of credit to the productive sectors is concerned. Nyasha and Odhiambo (2015) differentiate between the bank-based and market-based financial development in order to make a survey of the theoretical and empirical literature on the causal relationship between the market-based financial development and economic growth in both developed and developing countries. They conclude that the direction of causality between market-based financial development and economic growth varies from one country to another and it depends on various factors such as the proxy used to measure the level of market-based financial development, country-specific characteristics, data sets and the methods used by the researcher. Nevertheless, there is prevalent view that there exists the supply-leading response, where the development of the real sector is driven by the development of the market-based financial sector.

Similar studies use firm-level or industry level data. Demirgüc-Kunt and Maksimovic (2002) use firm-level data for the largest publicly traded manufacturing firms in 40 countries over the period 1989-1996 and find that there is no evidence that the difference in the organization of financial systems (market-based vs. bank-based financial system) affects the access of firms to external financing. However, they also find that the institutional variables (the development of a legal system of a country) influence access to external finance. Beck and Levine (2002) assess the impact of financial structure on capital allocation and also industry growth and new establishment formation across industries using data for 42 countries and 36 industries over the period 1980-1989 or 1980-1995. They do not find any support for the market-based or bank-based financial system and its impact on the efficiency of capital allocation across industries. Instead, they recommend focusing on institutional variables, i.e. the overall financial development and legal system efficiency as a more useful approach.

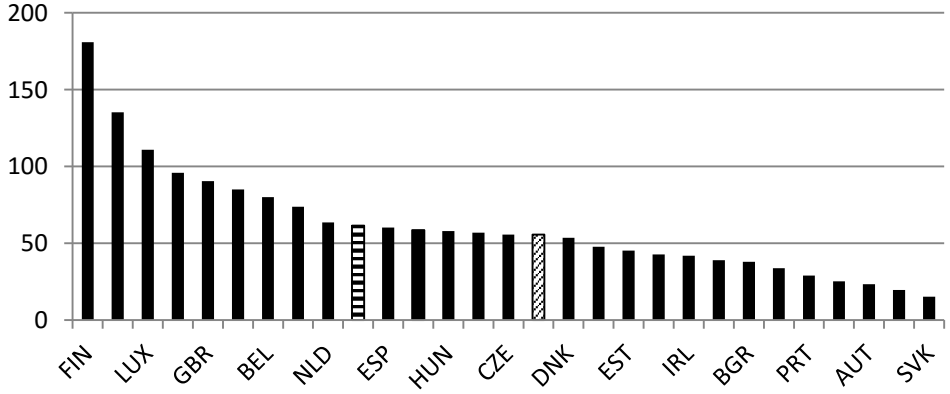
Other authors focus on the role of institutional variables. Levine (2002) discusses the financial services system (or more accurately the financial services view). This view does not distinguish between bank-based and market-based systems because the differences are not important. Both banks and markets should contribute to higher efficiency and economic development through contracts, markets, and intermediaries. This view also includes the law and finance view according to which institutional variables are the most important aspect of sound financial system and economic development (particularly the role of the legal system). Ergungor (2004) studies a set of institutional variables covering rights and regulations in 46 countries within the period 1960-1995. He concludes that legal tradition (civil-law vs. common-law systems) brings fundamentally different contract and law enforcement environments and as such it has an impact on the type of the financial system and also on the level of lending activity of a country. Uzunkaya (2012) analyses the sample of 87 countries to conclude that market-based systems work better in low-rule of law countries, while bank-based systems are more efficient in high-rule of law countries. Moreover, the level of financial development also plays an important role; the market-based system works better in financially developed economies, while the bank-based system is better in financially underdeveloped economies.

In our paper, we use both macroeconomic and bank-level data together with selected institutional data and try to identify main factors having an impact on bank lending in the EU countries with a view to the type of the financial system.

3. Bank-Based vs. Market-Based System: the Indicator

In order to identify the indicator of the type of the financial system, we use the indicator design by Levine (2002) and Beck and Levine (2002) who use the ratio of market capitalisation to the value of bank credit to the private sector as a measure of the size of stock markets relative to size of the bank markets. This approach has also been followed by Ergungor (2004), Uzunkaya (2012) or Gambacorta et al. (2014). According to Gambacorta et al. (2014), the financial structure of a country is considered as bank-based (market-based) if the ratio of bank assets to GDP is above (below) median. Demirgüc-Kunt and Maksimovic (2002) use a slightly different indicator; they measure the relative size of the market-based system to the bank-based system by the ratio of stock market capitalisation to total assets of deposit money banks. According to Levine (2002), this measure yields similar results when measuring the size of the bank markets by the total banking system assets instead of the bank credit to the private sector. Allard and Blavy (2011) present another approach when they distinguish between market-based or bank-based financial systems using the measure of the relative weight of market financing and bank lending in the financing of the non-financial private sector; a country is considered as bank-based when funding to the non-financial private sector from banks exceeds funding from market sources.

Figure 1: Market capitalisation to domestic credit to private sector provided by banks in the EU countries, 1998-2012 (average, in %)



Source: World Bank (2015)

In our paper, we follow Levine (2002) and Beck and Levine (2002) in order to differentiate between the market-based and bank-based financial system in the EU countries. Fig. 1 illustrates the

ratio of the market capitalisation to domestic credit to private sector provided by banks in the EU countries within the period 1998-2012. The interpretation of this indicator is that the higher the level of the indicator, the strongest the market-based system (and vice versa).

4. Methods and Data

The regression includes time and bank fixed effects, which can cover a large part of the endogeneity bias, which is time or bank invariant. The dependent variable *loans* represents the share of gross loans provided by banks to their total assets for a bank *i* in time *t*:

$$loans_{it} = \sum_{s=1}^{S} D_c \times \beta_s shocks_{ct}^{s} + \sum_{l=1}^{L} \beta_l inst_{ct}^{n} + \mu_i + \theta_t + \varepsilon_{ict}, \quad (1)$$

where variable *shocks* represents a selected macroeconomic shock *s* interacted with dummy variable *D* for a country *c*. The dummy is determined by the different level of market capitalization to domestic credit provided by banks in a country *c*. The last set of variables includes institutional determinants (e.g. rules of law and trust indicators). Finally, we include bank fixed effects μ, time effects θ, and applied OLS robust estimator to estimate robust standard errors ε.

Our dataset covers yearly data within the period 1998–2013 and includes 5176 commercial banks in EU27 (provided by the Bureau van Dijk – Bankscope database). Outliers were identified by banking controls (equity and assets) and removed between the 1% and 99% percentile. The data (except interest rates) were transformed using logs.

Macroeconomic shocks include several economic activity indicators (GDP, Consumption, Investments using gross capital formation, and Unemployment), inflation rate measured by the Harmonised Index of Consumer Prices (HICP), market liquidity in the interbank markets expressed by the level of financial assets of national central banks (Central bank assets), and policy rate expressed by individual marginal lending rates (Policy interest rate). The macroeconomic shocks and central bank assets were obtained from the online Eurostat database and marginal lending rates were provided by both the Eurostat and individual EU central banks. All macroeconomic shocks are applied in prices of the year 2005.

The institutional environment was analysed by indicators of economic freedom, shadow economy and policy risk (The Heritage Foundation, 2014). The applied Fiscal freedom index is a composite index of three quantitative factors: (1) the top tax rate on individual income, (2) the top tax rate on corporate income, and (3) total tax revenue as a percentage of GDP. Fiscal freedom index is a measure of the burden of government from the revenue side. In scoring the fiscal freedom component, each of these numerical variables is weighted equally as one-third of the factor. This equal weighting allows a country to achieve a score as high as 67 based on two of the factors even if it receives a score of 0 on the third. Fiscal freedom scores are calculated with a quadratic cost function to reflect the diminishing revenue returns from very high rates of taxation.

Shadow economy size, expressed by Index of shadow economy in our model, is measured as a percentage of official GDP provided by Schneider (2003), Schneider et al. (2010), and Schneider (2013).

To assess a policy risks we take into account a country's underlying political and regulatory structure. One of the suitable indicators is Policy constraint index (we use the Polcon III index) offered by Henisz (2002). This index identifies measurable number of veto points in a political system, multiple branches of the government and judicial independence. The interpretation of this index is that a political system with no checks and balances would have no constraints on the leading politicians because nobody dominates the power to veto key decisions. The scale ranges from 0 to 1; the low level of index means that political changes may become highly unpredictable which represents a lot of risk for the lending activities in the country.

We employ also Taxes on production, imports, individual or household income and income or profits of corporations. These indicators are provided by Eurostat national accounts, measured as total receipts from taxes and social contributions (including imputed social contributions) after deduction of amounts assessed but unlikely to be collected. The tax receipts are shares to GDP.

Banking controls are represented by several variables concerning asset quality, bank profitability, and financial leverage. The indicator of Capital funds to total assets generally captures the capital adequacy requirements and reflects the ability of the banking sector to absorb shocks arising from economic or financial stress; it measures the extent to which a bank has sufficient capital reserves relative to the risk of its activities. This indicator should be accompanied by the indicator of Financial leverage which points to the extent to which a bank has financed its assets with equity (not taking risk characteristics into account). Net interest margin is computed as a ratio of total interest revenues net of total interest expenses to total assets; the indicator thus measures the return on loans originated by a bank. Liquidity position of a bank can be assessed by Liquid assets to deposits and borrowings. An important financial measure of bank's efficiency (i.e. an efficiency ratio) is Cost to income ratio; it helps to assess the bank's cost in relation to income.

5. Results

5.1Basic Model

Table 1 presents the results of nine models that vary according to variables representing shocks and institutional determinants. As already mentioned above, we use several indicators of economic activity which we employ subsequently in models (1), (2) and (3) in the first step, then in model (4), (5) and (6) together with institutional determinants in the second step and finally in models (7), (8) and (9) in the third step where we use a different indicator representing the activity of fiscal policy. In all nine models, the indicators Central bank assets, Policy interest rates and HICP are also used.

According to our first results, all economic activity indicators are significant at 1% level in models (1), (2) and (3) and have an impact on the lending activities of banks in the sample. Positive impact of GDP, Investments and Consumption, as well negative impact of Unemployment confirms the theoretical background.

In the second step, we add three institutional variables described above (Policy constraint index, Index of shadow economy and Fiscal freedom index) in models (4), (5) and (6). Almost all variables proved to have a significant impact at 1% level on bank loans; the only exception is the Investments indicator which is not significant at 10% level.

In the third step, we use different indicators of taxes (taxes on production, imports, individual income and income or profits of corporations) instead of the Fiscal freedom index as an alternative measure of the fiscal policy activity. However, only Taxes on production were significant in the model. Results of models (7), (8) and (9) confirm the results of the previous models. Moreover, the *Investments* indicator is significant with a positive impact on the activity of banks regarding the level of provided bank loans. Thus, this indicator turns out to be a better indicator of fiscal policy activity. However, we prefer Fiscal freedom index in the next models due to its aggregate level.

In all models, i.e. in model (1)-(9), the variables Central bank assets and HICP are significant at 1% level and influence the level of bank loans positively. In other words, the higher the level of central bank financial assets, the higher the level of bank loans. This result can be interpreted in a way that the policy of quantitative easing leading to the purchases of securities from banks done by central banks could positively influence banks in their lending activities. At the same time, the variable Policy interest rate proves to be non-significant at 10%, i.e. it does not have any impact on lending activities of the banks in the sample.

Thus, we can conclude that the traditional (conventional) instrument of monetary policy – main policy interest rates – does not play an important role in the process of monetary policy implementation in the EU countries and was probably replaced by an alternative (unconventional) type of central bank activity in the form of quantitative easing.

Table 1: Macroeconomic shocks and institutions

	Dependent variable: Gross loans / total assets (1998 – 2013) (ln)								
Independent variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Central bank assets (ln)	0.0269***	0.0250***	0.0362***	0.0249***	0.0203***	0.0237***	0.0218***	0.0222***	0.0281***
	(0.0023)	(0.0023)	(0.0029)	(0.0026)	(0.0027)	(0.0033)	(0.0027)	(0.0027)	(0.0033)
Policy interest rate	-0.0004	0.0007	-0.0003	-0.0002	-0.0000	-0.0005	-0.0005	0.0002	-0.0006
	(0.0008)	(0.0008)	(0.0008)	(0.0008)	(0.0008)	(0.0009)	(0.0008)	(0.0008)	(0.0008)
HICP (ln)	0.1425***	0.1553***	0.4043***	0.2650***	0.2731***	0.4668***	0.2813***	0.2654***	0.4706***
	(0.0310)	(0.0296)	(0.0256)	(0.0338)	(0.0321)	(0.0277)	(0.0342)	(0.0322)	(0.0265)
GDP (ln)	0.1695***			0.1246***			0.1158***		
	(0.0122)			(0.0143)			(0.0144)		
Investments (ln)		0.0335***			-0.0143			0.0217**	
		(0.0083)			(0.0105)			(0.0100)	
Consumption (ln)		0.1186***			0.1458***			0.0948***	
		(0.0174)			(0.0199)			(0.0201)	
Unemployment (ln)			-0.0321***			-0.0122***			-0.0264***
			(0.0030)			(0.0035)			(0.0037)
Policy constraint index (ln)				0.0106***	0.0107***	0.0057*	0.0118***	0.0106***	0.0075**
				(0.0032)	(0.0032)	(0.0032)	(0.0032)	(0.0032)	(0.0031)
Index of shadow economy (ln)				-0.1083***	-0.1090***	-0.1618***	-0.0937***	-0.0481**	-0.1053***
				(0.0213)	(0.0216)	(0.0207)	(0.0210)	(0.0209)	(0.0211)
Fiscal freedom index (ln)				0.0423***	0.0392***	0.0428***			
				(0.0099)	(0.0105)	(0.0101)			
Taxes on production (ln)							-0.1195***	-0.1215***	-0.1731***
							(0.0140)	(0.0146)	(0.0153)
Year-specific effects	2001–2013	2003–2013	2001–2013	2001–2012	2001–2012	2001–2012	2001–2012	2002–2012	2001–2012
Observations	45549	45549	45549	41177	41177	41199	41147	41147	41147
Number of Banks	4722	4722	4722	4699	4699	4699	4699	4699	4699

Source: author's calculations

5. 2 Model for Large and Small Banks

In the fourth step, we use the model (4) and estimate it again according to the size of the bank in order to differentiate between large and small banks. However, we decided to drop *Policy interest rate* out of this model because it had not been significant in none of the nine models (see Table 1). We also add selected banking controls into this model. It is also necessary to examine possible differences between large and small banks in the sample. In order to do this, we three basic measures of the size of a bank: total bank assets higher than the 50th, 75th and 95th percentile. Our results are summarised in Table 2.

The size of a bank is related both to the whole sample (i.e. the whole EU) and to the country where the bank operates. This second approach enables a relatively small bank within the EU become a large bank within an individual country. Our results confirm a higher impact of Central bank assets on

lending activity of small banks compared to large bank, i.e. unconventional monetary policy could possibly help the small banks to avoid credit crunch. HICP and GDP have a positive influence on the dependent variable which is higher in case of large banks. In other words, economic activity could change the lending activity of large banks more than the monetary policy of a central bank (which affects particularly the lending behaviour of small banks). From the sample of banking controls, only *C*ost to income ratio proved to be non-significant. Both Capital funds/total assets and Net interest margin positively change the lending activity of banks (more in case of large banks) while Liquid assets/deposits and borrowings and Financial leverage has a negative impact.

5.3 Bank-Based vs. Market-Based Countries

Then, we estimate the model separately for bank-based countries and for market-based countries (see Table 3 and Table 4 in Appendix). Again, we take into account the size of a bank as in the previous step (see Table 2 in Appendix).

We find that there is almost any difference between bank-based and market-based countries as far as the central bank activity is concerned. It is partly due to the fact that most of the EU countries are bank-based rather than market-based economies. Moreover, results for large banks proved to be non-significant. In case of HICP, its effect is higher on lending activity of small banks in market-based countries and on lending activity of large banks in bank-based economies. So, the inflation rate is a serious determinant of the lending activity of large banks in bank-based countries and small banks in market-based countries. The economic activity (measured by the GDP indicator) has a stronger impact on the activity of banks in bank-based countries compared to market-based countries, i.e. banks in market-based economies are not so heavily hit by adverse economic shocks generating the fall of economic activity. However, many of the results are not significant so we cannot perform a precise comparison.

In case of institutional determinants, it is clear that more market-based countries are connected with a more important role which the institutional determinants play in bank lending activities. However, the Index of shadow economy positively influences the dependent variable in market-based countries which is quite surprising. In other words, the higher the share of shadow economy is the more money the banks lend. Another interesting difference between bank-based and market-based countries is that Policy constraint index is strongly significant only in market-based countries, i.e. predictable policy changes could substantially support lending activities in these countries.

From the set of the banking controls, only Capital funds/total asset, Net interest margin and Liquid assets/deposits and borrowings and partly Financial leverage (this indicator only in case of bank-based countries) proved to be significant in our model. There is not a striking difference between the two types of financial system when examining the impact of these variables on lending activity of banks.

6. Conclusion

The objective of the paper was to identify the link between the European bank lending activities and main macroeconomic shocks, banking controls and institutional variables in the sample of EU countries. Therefore, we estimated the impact of macroeconomics shocks, market liquidity and banking controls on the lending activities of the European banks both in the bank-based and market-based economies in the EU within the period 1998–2013.

We found that macroeconomic variables expressing the economic activity, such as GDP, investments and consumption or unemployment rate, had a significant impact on bank lending activities of the EU countries within the analysed time period. However, the impact of monetary policy, using the policy interest rates, is debatable; this variable proved to be non-significant in all models. Instead, central bank financial assets played an important role in the process of bank lending activities. In other words, central banks supported the lending activity of banking institutions by purchases of securities in order to increase the liquidity in interbank markets. Last but not least, institutional variables also influenced lending activity of banks especially in the strongly bank-based countries. These findings are consistent with findings of Beck and Levine (2002) and Levine (2002) who emphasises the role of institutional variables.

We also examine the role of large and small banks in this context. HICP and GDP have a positive influence on the lending activity and it is true particularly in case of large banks. So we can conclude that economic activity could change the lending activity of large banks more than the monetary policy of a central bank (which affects particularly the lending behaviour of small banks). Our results also confirm a higher impact of the activity of central banks on lending activity of small banks compared to large banks, i.e. the unconventional monetary policy could possibly help to advert the risk of the credit crunch in small banks. From the sample of banking controls, both Capital funds/total assets and Net interest margin positively change the lending activity of banks (more in case of large banks) while Liquid assets/deposits and borrowings and Financial leverage has a negative impact.

We also estimated the model separately for bank-based countries and for market-based countries. We found that there is almost any difference between bank-based and market-based countries as far as the central bank activity is concerned. It could be explained by the fact that most of the EU countries are bank-based rather than market-based economies. The inflation rate is also a serious determinant of the lending activity of large banks in bank-based countries and small banks in market-based countries. The economic activity (measured by the GDP indicator) has a stronger impact on the activity of banks in bank-based countries compared to market-based countries, i.e. banks in market-based economies are not so heavily hit by adverse economic shocks generating the fall of economic activity. So, economic growth supports the lending activity of banks particularly in bank-based countries. This result confirms conclusions of Chakraborty and Ray (2006) who state that the level of GDP *per capita* is higher in bank-based countries compared to market-based countries and that bank-based systems are connected with a higher level of lending activity (in the market-based systems, financial markets intermediate a lower amount of external finance to all economic agents).

The results concerning the institutional determinants confirm that they play an important role particularly in market-based. However, the positive impact of the shadow economy on bank lending activities is a bit surprising. Another interesting difference between bank-based and market-based countries is that Policy constraint index is strongly significant only in market-based countries, i.e. predictable policy changes could substantially support lending activities in these countries. In case of banking controls, only Capital funds/total asset, Net interest margin and Liquid assets/deposits and borrowings and partly Financial leverage (this indicator only in case of bank-based countries) proved to be significant in our model. There is not a striking difference between the two types of financial system when examining the impact of these variables on lending activity of banks.

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Appendix

Table 2: Specifics of large banks related to percentiles for total asset in the year 2013

	Dependent variable: Gross loans / total asset (1998 – 2013)						
	All banks	percentiles in the whole sample			percentiles in the countries		
Independent variables		>50th	>75th	>95th	>50th	>75th	>95th
Central bank assets (ln)		0.0182***	0.0153***	0.0215***	0.0156***	0.0103**	-0.0019
(large banks)	0.0313***	(0.0032)	(0.0037)	(0.0082)	(0.0032)	(0.0042)	(0.0095)
Central bank assets (ln)	(0.0028)	0.0539***	0.0435***	0.0336***	0.0554***	0.0436***	0.0329***
(small banks)		(0.0050)	(0.0041)	(0.0031)	(0.0047)	(0.0037)	(0.0030)
HICP (ln)		0.1650***	0.2026***	0.2864***	0.1739***	0.2343***	0.3340***
(large banks)	0.1578***	(0.0260)	(0.0335)	(0.0876)	(0.0269)	(0.0336)	(0.0825)
HICP (ln)	(0.0257)	0.0608	0.1106***	0.1495***	0.0938***	0.1209***	0.1556***
(small banks)		(0.0379)	(0.0359)	(0.0261)	(0.0360)	(0.0310)	(0.0261)
GDP (ln)		0.1185***	0.1301***	0.0301	0.1288***	0.1358***	0.0459
(large banks)	0.1095***	(0.0148)	(0.0172)	(0.0364)	(0.0146)	(0.0176)	(0.0404)
GDP (ln)	(0.0137)	0.0682***	0.0818***	0.1103***	0.0737***	0.0840***	0.1098***
(small banks)		(0.0236)	(0.0200)	(0.0144)	(0.0224)	(0.0181)	(0.0142)
Policy constraint index (ln)	0.0060*	0.0055	0.0067*	0.0063*	0.0061*	0.0067*	0.0061*
	(0.0036)	(0.0036)	(0.0036)	(0.0037)	(0.0036)	(0.0036)	(0.0036)
Index of shadow economy (ln)	-0.1137***	-0.1084***	-0.1082***	-0.1119***	-0.1074***	-0.1101***	-0.1130***
	(0.0162)	(0.0160)	(0.0163)	(0.0163)	(0.0161)	(0.0162)	(0.0163)
Fiscal freedom index (ln)	0.0204**	0.0133	0.0223**	0.0236***	0.0150	0.0183**	0.0221**
	(0.0091)	(0.0092)	(0.0093)	(0.0091)	(0.0092)	(0.0092)	(0.0091)
Capital funds / total assets		0.0038***	0.0057***	0.0104***	0.0037***	0.0048***	0.0087***
(large banks)	0.0030***	(0.0004)	(0.0006)	(0.0023)	(0.0004)	(0.0006)	(0.0014)
Capital funds / total assets	(0.0004)	0.0027***	0.0026***	0.0029***	0.0026***	0.0029***	0.0028***
(small banks)		(0.0006)	(0.0005)	(0.0004)	(0.0006)	(0.0005)	(0.0004)
Net interest margin		0.0115***	0.0159***	0.0281***	0.0125***	0.0125***	0.0138**
(large banks)	0.0118***	(0.0018)	(0.0025)	(0.0061)	(0.0018)	(0.0023)	(0.0062)
Net interest margin	(0.0013)	0.0115***	0.0103***	0.0114***	0.0107***	0.0113***	0.0118***
(small banks)		(0.0018)	(0.0015)	(0.0013)	(0.0019)	(0.0016)	(0.0014)
Liquid ass./ dep.and borrow.		-0.0038***	-0.0035***	-0.0025***	-0.0038***	-0.0033***	-0.0046***
(large banks)	-0.0033***	(0.0001)	(0.0003)	(0.0005)	(0.0002)	(0.0002)	(0.0003)
Liquid ass./ dep.and borrow.	(0.0001)	-0.0029***	-0.0032***	-0.0034***	-0.0028***	-0.0033***	-0.0033***
(small banks)		(0.0002)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Cost to income ratio		0.0001	-0.0000	-0.0006**	0.0001	-0.0001	-0.0005***
(large banks)	0.0001	(0.0001)	(0.0001)	(0.0002)	(0.0001)	(0.0001)	(0.0002)
Cost to income ratio	(0.0001)	0.0001	0.0001	0.0001	0.0001	0.0001*	0.0001
(small banks)		(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Financial leverage		-0.1248***	-0.0896***	-0.0162	-0.1228***	-0.1284***	-0.0543***
(large banks)	-0.1028***	(0.0199)	(0.0210)	(0.0212)	(0.0197)	(0.0211)	(0.0197)
Financial leverage	(0.0179)	-0.0171	-0.0872***	-0.1109***	-0.0386	-0.0585***	-0.1060***
(small banks)		(0.0229)	(0.0264)	(0.0216)	(0.0260)	(0.0219)	(0.0217)
Year-specific effects	2001–2012	2001–2012	2001–2012	2001–2012	2001–2012	2001–2012	2001–2012
Observations	29893	29893	29893	29893	29893	29893	29893
Number of countries	27	27	27	27	27	27	27
Number of banks	3162	3162	3162	3162	3162	3162	3162
Number of large banks		2003	1001	200	1995	998	199

Source: author's calculations

Table 3: Bank-based countries

	Dependent variable: Gross loans / total asset (1998 – 2013)						
	All banks	percentiles in the whole sample			percentiles in the countries		
Independent variables		>50th	>75th	>95th	>50th	>75th	>95th
Central bank assets (ln)		0.0027	0.0036	0.0300***	0.0001	0.0018	-0.0008
(large banks)	0.0225***	(0.0049)	(0.0058)	(0.0088)	(0.0051)	(0.0059)	(0.0115)
Central bank assets (ln)	(0.0038)	0.0517***	0.0331***	0.0242***	0.0502***	0.0322***	0.0232***
(small banks)		(0.0059)	(0.0050)	(0.0042)	(0.0054)	(0.0049)	(0.0041)
HICP (ln)		0.1170***	0.1474***	-0.0362	0.1227***	0.2081***	0.1360
(large banks)	0.0864***	(0.0268)	(0.0336)	(0.0742)	(0.0288)	(0.0375)	(0.1128)
HICP (ln)	(0.0254)	-0.0362	-0.0402	0.0823***	0.0013	0.0321	0.0892***
(small banks)		(0.0378)	(0.0359)	(0.0262)	(0.0363)	(0.0324)	(0.0259)
GDP (ln)		0.1600***	0.1563***	0.1537***	0.1713***	0.1508***	0.1752***
(large banks)	0.1631***	(0.0167)	(0.0191)	(0.0382)	(0.0180)	(0.0207)	(0.0642)
GDP (ln)	(0.0151)	0.1408***	0.1628***	0.1607***	0.1396***	0.1544***	0.1611***
(small banks)		(0.0258)	(0.0222)	(0.0159)	(0.0230)	(0.0195)	(0.0154)
Policy constraint index (ln)	0.0002	0.0008	0.0009	0.0014	0.0006	0.0009	0.0006
	(0.0046)	(0.0046)	(0.0046)	(0.0046)	(0.0047)	(0.0046)	(0.0046)
Index of shadow economy (ln)	-0.1278***	-0.1153***	-0.1246***	-0.1274***	-0.1183***	-0.1232***	-0.1260***
	(0.0167)	(0.0165)	(0.0168)	(0.0169)	(0.0167)	(0.0169)	(0.0168)
Fiscal freedom index (ln)	0.0318***	0.0267***	0.0281***	0.0334***	0.0280***	0.0302***	0.0327***
	(0.0097)	(0.0098)	(0.0099)	(0.0097)	(0.0098)	(0.0098)	(0.0097)
Capital funds / total assets		0.0035***	0.0041***	0.0144***	0.0035***	0.0050***	0.0082***
(large banks)	0.0027***	(0.0005)	(0.0010)	(0.0024)	(0.0005)	(0.0007)	(0.0016)
Capital funds / total assets	(0.0004)	0.0028***	0.0027***	0.0024***	0.0024***	0.0027***	0.0025***
(small banks)		(0.0007)	(0.0005)	(0.0004)	(0.0006)	(0.0005)	(0.0005)
Net interest margin		0.0107***	0.0076***	0.0249***	0.0097***	0.0108***	0.0113*
(large banks)	0.0112***	(0.0018)	(0.0022)	(0.0069)	(0.0019)	(0.0026)	(0.0059)
Net interest margin	(0.0014)	0.0117***	0.0123***	0.0107***	0.0121***	0.0111***	0.0112***
(small banks)		(0.0021)	(0.0018)	(0.0014)	(0.0021)	(0.0017)	(0.0015)
Liquid ass./ dep.and borrow.		-0.0038***	-0.0035***	-0.0052***	-0.0040***	-0.0035***	-0.0051***
(large banks)	-0.0035***	(0.0001)	(0.0002)	(0.0005)	(0.0002)	(0.0002)	(0.0003)
Liquid ass./ dep.and borrow.	(0.0001)	-0.0031***	-0.0035***	-0.0034***	-0.0030***	-0.0035***	-0.0034***
(small banks)		(0.0002)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Cost to income ratio		0.0001*	-0.0001	-0.0003	0.0001	0.0000	-0.0005***
(large banks)	0.0001	(0.0001)	(0.0001)	(0.0003)	(0.0001)	(0.0001)	(0.0002)
Cost to income ratio	(0.0001)	0.0000	0.0001**	0.0001	0.0001	0.0001	0.0001
(small banks)		(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Financial leverage		-0.1610***	-0.1387***	0.0207	-0.1539***	-0.1576***	-0.0724**
(large banks)	-0.1410***	(0.0269)	(0.0308)	(0.0326)	(0.0270)	(0.0278)	(0.0293)
Financial leverage	(0.0209)	-0.0028	-0.1073***	-0.1567***	-0.0500	-0.0794***	-0.1436***
(small banks)		(0.0287)	(0.0251)	(0.0243)	(0.0323)	(0.0280)	(0.0246)
Year-specific effects	2001 – 2012	2001 – 2012	2001 – 2012	2001 – 2012	2001 – 2012	2001 – 2012	2001 – 2012
Observations	26544	26544	26544	26544	26544	26544	26544
Number of countries	18	18	18	18	18	18	18
Number of banks	2518	2518	2518	2518	2518	2518	2518
Number of large banks		1457	729	146	1452	727	145

Source: author's calculations

Table 4: Market-based countries

	Dependent variable: Gross loans / total asset (1998 – 2013)						
	All banks	percentiles in the whole sample			percentiles in the countries		
Independent variables		>50th	>75th	>95th	>50th	>75th	>95th
Central bank assets (ln)		0.0280***	0.0297***	-0.0056	0.0212**	0.0236**	0.0239
(large banks)	0.0359***	(0.0092)	(0.0104)	(0.0134)	(0.0085)	(0.0096)	(0.0163)
Central bank assets (ln)	(0.0087)	0.0490***	0.0382***	0.0307***	0.0450***	0.0366***	0.0381***
(small banks)		(0.0122)	(0.0102)	(0.0081)	(0.0117)	(0.0096)	(0.0089)
HICP (ln)		0.0257**	0.0880	0.4175***	0.0946	-0.0312	0.0710
(large banks)	0.1431	(0.0962)	(0.1075)	(0.1526)	(0.0746)	(0.0916)	(0.1555)
HICP (ln)	(0.0869)	0.1468	0.2030**	0.0262	0.1398	0.1758**	0.1342
(small banks)		(0.1122)	(0.0972)	(0.0638)	(0.1063)	(0.0830)	(0.0894)
GDP (ln)		0.0377	0.1168***	-0.1042	0.0991***	0.1441***	-0.0066
(large banks)	0.0007	(0.0322)	(0.0365)	(0.0678)	(0.0279)	(0.0336)	(0.0563)
GDP (ln)	(0.0305)	-0.0579	-0.0571	0.0194	-0.0674	-0.0480	0.0017
(small banks)		(0.0416)	(0.0350)	(0.0266)	(0.0415)	(0.0323)	(0.0314)
Policy constraint index (ln)	0.0183***	0.0185***	0.0187***	0.0262***	0.0239***	0.0226***	0.0183***
	(0.0057)	(0.0058)	(0.0058)	(0.0054)	(0.0057)	(0.0057)	(0.0057)
Index of shadow economy (ln)	0.0863*	0.0895*	0.0924**	0.0793*	0.0998**	0.0915**	0.0865*
	(0.0459)	(0.0459)	(0.0464)	(0.0447)	(0.0471)	(0.0448)	(0.0461)
Fiscal freedom index (ln)	0.0594*	0.0715**	0.0665**	0.0557**	0.0425	0.0330	0.0574*
	(0.0311)	(0.0311)	(0.0312)	(0.0280)	(0.0294)	(0.0298)	(0.0313)
Capital funds / total assets		0.0048***	0.0044***	0.0043**	0.0043***	0.0026*	0.0084***
(large banks)	0.0031***	(0.0008)	(0.0011)	(0.0021)	(0.0009)	(0.0016)	(0.0031)
Capital funds / total assets	(0.0009)	0.0021	0.0029**	0.0034***	0.0023*	0.0031***	0.0031***
(small banks)		(0.0013)	(0.0012)	(0.0009)	(0.0013)	(0.0010)	(0.0009)
Net interest margin		0.0198***	0.0162***	0.0235**	0.0280***	0.0226***	0.0075
(large banks)	0.0135***	(0.0037)	(0.0049)	(0.0103)	(0.0043)	(0.0054)	(0.0098)
Net interest margin	(0.0037)	0.0091*	0.0131***	0.0128***	0.0059	0.0117***	0.0137***
(small banks)		(0.0053)	(0.0042)	(0.0037)	(0.0048)	(0.0044)	(0.0037)
Liquid ass./ dep.and borrow.		-0.0032***	-0.0025***	-0.0005***	-0.0030***	-0.0024***	-0.0014***
(large banks)	-0.0026***	(0.0004)	(0.0005)	(0.0001)	(0.0004)	(0.0005)	(0.0005)
Liquid ass./ dep.and borrow.	(0.0003)	-0.0021***	-0.0026***	-0.0030***	-0.0022***	-0.0027***	-0.0026***
(small banks)		(0.0004)	(0.0003)	(0.0003)	(0.0004)	(0.0003)	(0.0003)
Cost to income ratio		0.0000	-0.0003**	-0.0004	0.0000	-0.0004**	-0.0006
(large banks)	0.0001	(0.0001)	(0.0001)	(0.0003)	(0.0001)	(0.0002)	(0.0004)
Cost to income ratio	(0.0001)	0.0002	0.0003*	0.0001	0.0002	0.0002*	0.0001)
(small banks)		(0.0002)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0001)
Financial leverage		-0.0173	0.0129	0.0258	-0.0140	-0.0249	-0.0021
(large banks)	-0.0337	(0.0218)	(0.0246)	(0.0169)	(0.0223)	(0.0258)	(0.0213)
Financial leverage	(0.0211)	-0.0398	-0.0539	-0.0361	-0.0405	-0.0401	-0.0378
(small banks)		(0.0374)	(0.0351)	(0.0267)	(0.0375)	(0.0298)	(0.0270)
Year-specific effects	2008–2012	2008–2012	2008–2012	no	2012	2012	2008–2012
Observations	3349	3349	3349	3349	3349	3349	3349
Number of countries	9	9	9	9	9	9	9
Number of banks	644	644	644	644	644	644	644
Number of large banks		545	273	55	543	271	54

Source: author's calculations