Access to Credit and Unconventional Monetary Policy in the Eurozone after the Financial Crisis[1]

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Abstract

This paper investigates the availability of bank credit to enterprises in the Eurozone after the recent financial crisis. The analysis draws from a rich firm-level dataset on perceived credit availability of micro-, small- and medium-sized, and large enterprises in 11 countries in the Eurozone during the time horizon 2010 – 2014. Employing probit and logit estimators, the empirical results suggest that GDP growth is a significant factor improving availability to small and medium-sized, and large firms. I also find evidence on the heterogeneous impact of quantitative easing conducted by the European Central Bank within the Euro area. The non-standard measures improve credit availability in the central economies, while my estimates do not show an effect in the Eurozone periphery.

Keywords: *credit availability, credit rationing, credit constraints, credit supply, financial crisis recovery*

JEL Classification: E51, E52

Introduction

The Eurozone banking sector has partly recovered from the turmoil that was caused by the recent financial crisis. The reaction of the European Central Bank (ECB) to support the liquidity of the banking system with massive asset-purchase programmes has had the aim to boost bank lending and contain adverse economic outcomes (Eser and Schwaab, 2016). The ECB officially launched its

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programme of quantitative easing in 2015, but the first reaction to the crisis with large-scale asset purchasing occurred in 2009, followed by Second Covered Bond Purchase programme launched in 2011 and Securities Markets Programme introduced in 2010 (ECB, 2012). Across the Euro area, lending to non-financial corporations returns to moderate growth being supported by increasing demand across all loan categories (ECB, 2016).

Access to bank credit is crucial for economic recovery and stressed credit conditions are an important factor constraining the pace of the recovery (Kannan, 2012). On average it takes about eight years to reach the pre-crisis level of growth (Reinhart and Rogoff, 2014). In particular, industries relying more on external finance grow more slowly than other industries during recoveries from recessions associated with financial crises (Kannan, 2012). Micro-, small- and medium-sized firms (SMEs) are primarily affected by stressed credit conditions due to their limited ability to substitute bank credit to other forms of external finance (Klein, 1998; Koráb and Poměnková, 2014). Similarly, innovative firms face higher growth obstacles due to their high demand for external capital (Lee, Sameen and Cowling, 2015).

This paper investigates the availability of bank credit to enterprises in 11 Eurozone countries during the recovery from the recent financial crisis. The empirical analysis employs a unique firm-level publicly unavailable survey dataset provided by the European Central Bank on perceived credit availability and estimates the effect of non-standard monetary measures implemented by the ECB after the onset of the financial crisis. While the majority of previous studies rely on aggregated (Orlowski, 2015; Wang, 2016; Weale and Wieladek, 2016) and banking (Bowman et al., 2015; García-Posada and Marchetti, 2016) data, I contribute to the literature with firm-level evidence on credit availability in the Eurozone during the recovery from the financial crisis. The empirical analysis uses survey data which captures the perception of enterprises with a low bias and does not rely on the proxy measures that are commonly used in the literature (Almeida, Campello and Weisbach, 2002; Li, 2011; Yen et al., 2014).

The empirical methodology of this study follows the standards in the literature (Canton et al., 2013; Fidrmuc, Hake and Stix, 2013; Ogura, 2012) and employs probit and logit estimators to analyse the unbalanced panel of 37 293 micro-, small- and medium-sized, and large firms from 11 Eurozone countries during the period 2010 – 2014. Firm-level data are combined with aggregated data on macroeconomic shocks.

The paper is organised as follows: after the introduction, the first part reviews the literature, the next section presents the data, the following section describes the model and empirical methods, the fifth part provides results and their discussion, and the last part concludes the paper.

1. Literature Review

There has been a large body of empirical literature investigating the availability of bank credit during and after the recent financial crisis and the factors that impact bank lending to firms and households. The literature covers macroeconomic, monetary policy and banking-sector variables, and firm-specific factors which determine bank lending behaviour.

Economic growth strongly determines the profitability of commercial banks and the volume of supplied credit (Aysun and Hepp, 2016). Gunji and Yuan (2010) show that less profitable banks tend to reduce loans during a negative macroeconomic shock more substantially than profitable banks because these banks can obtain financing more easily outside deposits. The profitability of banks associated with better macroeconomic performance during the recovery phase enables banks to broaden their credit portfolio and enhance credit availability (Gunji and Yuan, 2010; Koráb and Poměnková, 2017).

Monetary policy impacts bank lending via the bank lending transmission channel (Mishkin, 2004). The effectiveness of monetary policy implementation is reduced when a credit crunch occurs, i.e. in a situation of a decline in credit supply while holding real interest rate and the quality of borrowers constant (Bernanke and Lown, 1991). This problem occurred during the financial crisis in several Eurozone economies (Iyer et al., 2014; Vouldis, 2015) and is frequently associated with the perception of credit risk (Koráb and Poměnková, 2017).

The interbank market plays a key role in the short-term financing of commercial banks. Its freezing, i.e. a liquidity crunch, has dramatic effects on credit supply (Iyer et al., 2014; Vodová, 2011). The reduction of credit supply is stronger for small firms, with weaker banking relationships which cannot compensate for bank credit with other sources of debt. Furthermore, the impact of illiquidity on credit supply during the financial crisis is stronger for less solvent banks (Iyer et al., 2014).

Commercial banks use household deposits as a source of capital to finance bank credit (Herrera, Hurlin and Zaki, 2013; Hurlin and Kierzenkowski, 2007). A shortage of liquid assets can have dramatic consequences on bank lending behaviour. Ivashina and Scharfstein (2010) show in the example of the recent financial crisis that banks cut their lending less if they have better access to deposit financing.

The amount of capital the banks dispose of and the volume of capital that the banks are required to hold due to banking regulations are negatively correlated with loan supply (Herrera, Hurlin and Zaki, 2013). Capital regulatory measures force banks to hold large volumes of capital on their balance sheets, which reduces the available resources for providing credit (Fidrmuc, Hake and Stix,

2013). Hancock and Wilcox (1998) have shown that in response to declines in their own bank capital, small banks shrink their loan portfolios considerably more than large banks.

The quality of credit portfolio is frequently discussed in relation to the rate of non-performing loans. Before being written off a loan is normally classified as non-performing when a customer's payments are in arrears (Kauko, 2012). A high rate of non-performing loans may cause expectations about the stability of the banking system to deteriorate, creating systemic risk, which may in turn lead to a run on deposits and significantly reduce lending (Anastasiou, Louri and Tsionas, 2016). Aiyar et al. (2015) provide evidence that after the financial crisis, the rate of non-performing loans rose to above 10% in Eurozone peripheral countries, while in the "core" Eurozone countries non-performing loans were below 5% of total loans.

One stream in the literature, which looks at firm-specific factors that impact bank lending, argues that an adverse macroeconomic shock negatively affects the financial health of companies and increases their firm-specific credit risk (Kaplan and Zingales, 1997; Lamont, Polk and Saá-Requejo, 2001). Banks evaluate firm-specific credit risk and decide on providing the loan and the lending interest rate. A decline in credit supply may be a consequence of increasing credit risk because banks are reluctant to provide credit to companies in a poor financial situation (Hadlock and Pierce, 2010; Whited and Wu, 2006).

This paper focuses on subjectively perceived constraints, rather than analysing objective information related to the success of loan applications. This stream of the literature uses data from company surveys (Cole and Sokolyk, 2016; Fidrmuc, Hake and Stix, 2013; Holton, Lawless and McCann, 2014; Kremp and Sevestre, 2013; Popov and Udell, 2012). Looking at firm-specific factors, Canton et al. (2013) show that young and small firms have the worst perception of access to bank loans. Similarly, Ferrando, Popov and Udell (2017) find that micro firms and firms with low turnover are more likely to be denied credit in stressed credit conditions associated with a sovereign debt crisis. Using survey data for the Euro area during the recovery period, Ferrando and Griesshaber (2011) show that only age and ownership are robust explanatory variables for firms' perceived financing obstacles while mixed results are found for size and economic branches.

2. Data

This empirical study follows the stream in the literature (e.g. Fidrmuc, Hake and Stix, 2013; Kremp and Sevestre, 2013), employing firm-level survey data on perceived difficulties in accessing bank credit. The advantage of using survey

data is low bias in credit availability identification, compared to the other empirical methods (Silva and Carreira, 2012).

The unbalanced firm-level dataset comes from the EC/ECB Survey on Access to Finance of Enterprises (SAFE) database covering the period 2010 – 2014. Yearly pooled cross-sectional dataset uses survey data of 37 293 micro-, small- and medium-sized and large firms in Austria, Belgium, Germany, Spain, Finland, France, Greece, Ireland, Italy, Netherlands and Portugal.

The dataset is consequently completed with macro-level and banking variables (Table 1) at the country level. Variables for the model in (2) have been selected in line with the literature which is reviewed in the preceding section. The analysis especially focuses on non-standard monetary measures (asset purchase programmes) that the European Central bank used to tackle the crisis. Growth of central bank assets is selected because this data clearly reflects the purchasing programmes of short-term and long-term assets conducted by the ECB, and also due to the data availability for all countries in the sample.

Variables GDP, Lend.Cap, CBasset, NPL and CAP are for the purpose of the empirical analysis transformed to growth rates. The lending interest rate, ROA and LIQ are measured in [%], interest income is used in [%] of total assets. GDP is seasonally-adjusted.

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Definition of Variables

Variable	Definition	Expected relationship	Source
Credit	Perception of firms of credit availability.	outcome variable	ECB SAFE
GDP	Gross domestic product in current prices.	+	Eurostat
IR	Lending interest rate to non-financial corporations.	–	ECB data warehouse
LendCap	Lending capacity of commercial banks. Household deposits at commercial banks.	+	ECB data warehouse
CAP	Capital and reserves of monetary financial institutions (MFI).	+	ECB data warehouse
CBasset	Central bank assets. Measure of non-standard monetary instruments (asset-purchase programmes) conducted by the European central Bank.	+	IMF
LIQ	Liquid Liabilities to GDP.	+	World Bank
ROA	Return on assets of commercial banks. Profitability indicator of commercial banks.	+	World Bank
IIncome	Net interest income. Profitability indicator of commercial banks.	+	ECB data warehouse
NPL	Bank non-performing loans to total gross loans	–	World Bank

Note: The table presents the definitions of the dependent variable (Credit), and the independent variables in the model specified in the section 3.1., along with expected relationships. The economic rationale of variables selection and expected relationship is presented in Literature review (section 1).

Source: Own work.

Information on the structure of the firm-level dataset, summary statistics of the variables used in the analysis and their pairwise correlations are presented in the appendix (Appendices A – C).

3. Empirical Methodology

3.1. The Model

The empirical model is specified in line with the literature on the determinants of bank lending which is presented in section 1. Availability of bank credit $credit_{it}$ is used as the outcome variable in the model. The enterprises in the sample were asked the question:

"Would you say that availability of bank loans has improved, remained unchanged or deteriorated for your firm over the past 6 months?"

Responses from SAFE surveys have an ordinal specification which reflects the changes in the availability of bank credit to enterprises:

$$credit_{it} = \begin{Bmatrix} 3 = \text{"improved"} \\ 2 = \text{"remained unchanged"} \\ 1 = \text{"deteriorated"} \end{Bmatrix} \quad (1)$$

The final empirical model is consequently completed with macroeconomic and banking sector factors (closely defined in Table 1), and has the form:

$$credit_{it} = \beta_0 + \beta_1 \Delta Macro_{it} + \beta_2 \Delta Banks_{it} + \gamma_t + \sigma_i + \upsilon_i + \tau_{it} + \varepsilon_{it} \quad (2)$$

where

$credit_{it}$ – dependent variable characterizing availability of bank credit,

$Macro_{it}$ – a vector of explanatory macroeconomic variables specified in the previous section,

$Banks_{it}$ – a vector of banking sector explanatory variables,

β_0 – parameter represents the overall constant in the model,

γ_t – captures country effects,

σ_i – firm sector fixed effects,

τ_{it} – firm size fixed effects,

υ_i – age fixed effects,

ε_{it} – the error terms for a firm *i* in time *t.*

A series of dummy variables is constructed to reflect the firm age υ_i and firm size τ_{it}. Both fixed effects are used from the SAFE surveys. For the size, the classes are constructed for micro- (1 – 9 employees), small- (10 – 49 employees) and

medium-sized (50 – 249 employees), and large enterprises (250 or more employees). For the age fixed effect, the firms are classified into four classes: υ_i >= 10 years, $\upsilon_i \in (10\,years,\ 5\,years\rangle$, $\upsilon_i \in (5\,years,\ 2\,years\rangle$, and υ_i < 2 years.

3.2. Empirical Methods

The empirical framework uses discrete choice models that are commonly used in the literature (Canton et al., 2013; Fidrmuc, Hake and Stix, 2013; Ogura, 2012) – the ordered probit and ordered logit estimators. Discrete choice models are non-linear models for a dependent variable that indicate in which of the mutually exclusive discrete categories the outcome of interest falls (Cameron and Trivedi, 2005). The outcome variable is in our case of an ordered character reflecting the response of enterprises to survey questions.

The empirical model specified in (2) is estimated by the maximum likelihood of the following equation (3):

$$credit_{it} = \begin{Bmatrix} \mathrm{P(credit_{it} = 3\,|x_{it},\ \beta,\ m) = \ F(m_1 - x_{it}\,.\,\beta)} \\ \mathrm{P(credit_{it} = 2\,|x_{it},\ \beta,\ m) = \ F(m_2 - x_{it}\,.\,\beta) - F(m_1 - x_{it}\,.\,\beta)} \\ \mathrm{P(credit_{it} = 1\,|x_{it},\ \beta,\ m) = \ F(m_3 - x_{it}\,.\,\beta) - F(m_2 - x_{it}\,.\,\beta)} \end{Bmatrix} \qquad (3)$$

where

β – regression parameters,

$\mathrm{m_1}$, $\mathrm{m_2}$ and $\mathrm{m_3}$ – thresholds,

$F(\cdot)$ – distribution function of the residual term ε_{it} in (2).

The empirical analysis uses ordered logistic regression (ordered logit) where ε_{it} are logistic distributed, and ordered probit where the residual term is standard normal distributed.

4. Results and Discussion

4.1. Baseline Results

The estimations are performed on the whole sample of enterprises, consequently on the panels of micro enterprises, SMEs and large firms, employing both ordered logit and ordered probit estimators (Table 2). In all panels except micro enterprises, GDP growth significantly affects the availability of bank credit in the post-crisis period. The effect of the lending interest rate on credit availability is in accordance with economic theory in the panel of micro enterprises.

The lending rate, however, does not have a significant effect on credit availability to SMEs and large firms. This fact may be explained by stronger banking relationships of medium and large firms, compared to micro and small enterprises (Jiménez et al., 2010). Firms with strong banking relationships tend to pay significantly lower interest rate premium in times of financial distress (Kawai, Hashimoto and Izumida, 1996) and generally have increased credit availability and more effectively overcome financial distress (Sang-Woo, 2004). The market lending rate, therefore, may not affect them due to their individual specific loan contracts.

In all panels except large firms, the effect of the central bank assets, i.e. the variable that captures the non-standard asset purchase programmes launched after the onset of financial crisis, on credit availability at the firm-level is insignificant. It should be noted that the analysis focuses on the period 2010 – 2014 during which quantitative easing had not yet been introduced, but the ECB was conducting different types of asset purchase programme.

Analysing the whole sample of all countries, this study has provided evidence that, except for the subsample of large enterprises, asset-purchase programmes conducted by the ECB before the introduction of quantitative easing did not have a significant effect on credit availability.

T a b l e 2

Ordered probit and Ordered logit Estimation

	Dependent variable: credit availability							
Independent	Whole sample		Micro firms		SMEs		Large firms	
variables	Logit	Probit	Logit	Probit	Logit	Probit	Logit	Probit
GDP	0.058***	0.031***	–0.016	–0.009	0.059***	0.031***	0.187***	0.108***
	(0.015)	(0.009)	(0.030)	(0.017)	(0.019)	(0.011)	(0.051)	(0.029)
IR	–0.141	–0.078	–0.302*	–0.179*	–0.136	–0.071	0.212	0.164
	(0.091)	(0.053)	(0.169)	(0.099)	(0.116)	(0.067)	(0.324)	(0.189)
Cbasset	0.001	0.001	0.001	0.001	0.001	0.001	–0.006**	–0.003**
	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.002)
ROA	–0.011	–0.011	–0.002	–0.008	0.015	0.004	–0.133	–0.072
	(0.031)	(0.018)	(0.057)	(0.033)	(0.039)	(0.023)	(0.107)	(0.062)
CAP	–0.003	–0.001	0.01	0.005	–0.006	–0.003	–0.026	–0.014
	(0.005)	(0.003)	(0.010)	(0.006)	(0.007)	(0.004)	(0.021)	(0.012)
LendCap	0.038**	0.022**	0.028	0.016	0.041*	0.023*	0.075	0.047
	(0.019)	(0.011)	(0.036)	(0.021)	(0.024)	(0.014)	(0.069)	(0.040)
LIQ	–0.015*	–0.008	–0.006	–0.004	–0.01	–0.004	–0.105***	–0.061***
	(0.009)	(0.005)	(0.017)	(0.010)	(0.012)	(0.007)	(0.035)	(0.020)
NPL	–0.003	–0.002	–0.001	–0.001	–0.005	–0.003*	0.001	0.001
	(0.003)	(0.001)	(0.005)	(0.003)	(0.003)	(0.002)	(0.009)	(0.005)
IIncome	0.768***	0.459***	0.896**	0.531**	0.792***	0.471***	–0.174	–0.129
	(0.222)	(0.130)	(0.398)	(0.232)	(0.282)	(0.165)	(0.934)	(0.541)
Country, age, size, sector FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	14 423	14 423	4 352	4 352	8 922	8 922	1 149	1 149
r2	0.029	0.0284	0.0368	0.036	0.0315	0.0308	0.0293	0.029

Note: Standard errors in parentheses, *** p < 0.01, ** p < 0.05, * p < 0.1

Source: Own calculations.

The effect of other variables (liquidity, lending capacity and interest income) is in line with economic theory expectations. Interest income as the indicator of bank profit has a positive significant effect on credit availability in micro firms and SMEs (Table 2). The estimates show a negative coefficient of liquidity ratio, but from the construction of the indicator (Liquid liabilities to GDP) the estimates show an improvement in credit availability with the increasing liquid liabilities in the numerator of the ratio.

Overall, analysing the whole sample including all the Eurozone countries provides inconclusive results. A large number of variables are insignificant and, in the case of the effect of the non-standard measures of the ECB, the results do not confirm theoretical expectations. I therefore further explore country differences between the central and peripheral economies in the Euro area.

4.2. Country Differences in Results

Country differences in the results are explored by dividing the main sample into two panels – "Central EA" which comprises of Austria, Germany, Belgium, France, the Netherlands and Finland, and "Periphery EA" including Portugal, Italy, Spain, Ireland and Greece. This section also serves as the sensitivity analysis of the baseline results. The estimates are presented in Table 3.

T a b l e 3

Country Differences in the Results

	Dependent variable: credit availability			
Independent	Periphery EA		Central EA	
variables	Logit	Probit	Logit	Probit
GDP	–0.008 (0.095)	–0.012 (0.055)	0.093** (0.045)	0.050** (0.025)
IR	–0.253 (0.266)	–0.157 (0.156)	–1.431*** (0.533)	–0.790*** (0.300)
Cbasset	0.001 (0.003)	0.001 (0.002)	0.007*** (0.002)	0.004*** (0.001)
ROA	0.126 (0.154)	0.076 (0.089)	–0.270 (0.710)	–0.176 (0.399)
CAP	0.038* (0.022)	0.024* (0.013)	0.048*** (0.016)	0.028*** (0.009)
LendCap	0.116 (0.089)	0.071 (0.052)	–0.063 (0.039)	–0.033 (0.022)
LIQ	0.035* (0.019)	0.021* (0.011)	–0.017 (0.039)	–0.008 (0.022)
NPL	0.000 (0.008)	0.000 (0.005)	–0.008* (0.005)	–0.004* (0.003)
IIncome	0.149 (0.332)	0.082 (0.198)	0.572 (1.854)	0.354 (1.045)
Country, age, size, sector FE	YES	YES	YES	YES
Observations	6 820	6 820	7 603	7 603
r2	0.0394	0.0383	0.0153	0.0148

Note: Standard errors in parentheses, *** p < 0.01, ** p < 0.05, * p < 0.1

Source: Own calculations.

Further exploration shows significant differences between the "Central EA" and peripheral Eurozone countries. In the group of countries defined as the "Central EA", most fundamental macroeconomic and banking sector variables (GDP, lending interest rate, central bank assets, capital of banks and non-performing loans) have the expected sign of the coefficient predicted by theory and are significant.

In the panel of peripheral countries, no banking-sector variables, except for bank capital and liquidity, are significant. These results support the findings of Poměnková and Kapounek (2012) providing evidence on the heterogeneous distribution of money supply in the Eurozone after the financial crisis. During 2010 – 2012, the ECB provided liquidity and the M3 money supply increased mainly in the core Eurozone member countries (especially in Germany, France, Austria and Finland). Similarly, Altavilla, Canova and Ciccarelli (2016) find that different banks reacted differently to monetary policy changes and that the unconventional monetary policy pass-through in the Eurozone is heterogeneous. Between 2011 and 2014, the range of the distribution of lending rates in "stressed" countries (Greece, Cyprus, Italy, Spain, Ireland and Portugal) was largely different in comparison with non-stressed countries (Austria, France, Germany and the Netherlands). The presented results are also in line with Burriel and Galesi (2016). In their perspective, most Euro area members benefit from unconventional monetary policy measures, but with a substantial degree of heterogeneity. Countries with less fragile banking systems benefit the most from unconventional monetary policy measures in terms of credit growth.

The results of this study support these findings. The analysis shows a significant impact of monetary policy measures on credit availability in the "Central EA" countries. One of possible explanations is the higher risk the Eurozone periphery that the banks perceive (see Koráb and Poměnková, 2017). As the results, banks do not increase lending despite the monetary stimulus of the ECB.

Conclusions

This paper analyses the perceived availability of bank credit to enterprises in the Eurozone countries during the recovery from the recent financial crisis. The empirical framework employs probit and logit models to analyse a unique restricted-access firm-level data of perceived loan availability provided by the European Central Bank in 11 countries in the Euro area. The firm-level dataset is merged with the aggregated macroeconomic and banking sector dataset.

The main findings of this study suggest that GDP growth is improving availability to small and medium-sized and large firms. This factor is robust in all model specifications except micro firms. The analysis reveals the heterogeneous

impact of monetary policy measures, especially non-standard monetary policy instruments within the Euro area. While the asset purchase programmes improved the availability of credit in the "central" Eurozone member countries (Austria, Belgium, Germany, Finland, France and the Netherlands), the estimates do not show a significant effect in the peripheral economies of the Euro area.

These results are in line with several empirical studies on heterogeneous interest rate pass-through of the European Central Bank and contribute to the policy debates about the effects of quantitative easing in the Eurozone.

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Appendices

Appendix A

Structure of the Firm-level Dataset

Year	AT	BE	DE	ES	FI	FR	GR	IE	IT	NL	PT	Euro area
2010	200	203	1 000	1 000	100	1 003	200	100	1 000	256	250	5 312
2011	502	500	1 006	1 001	500	1 002	500	502	1 001	500	502	7 516
2012	506	500	1 006	1 001	500	1 001	500	500	1 000	500	500	7 514
2013	501	500	1 000	1 001	501	1 002	500	500	1 000	500	500	7 505
2014	502	501	1 337	1 303	501	1 500	501	500	1 500	800	501	9 446
Total	2 211	2 204	5 349	5 306	2 102	5 508	2 201	2 102	5 501	2 556	2 253	37 293

Note: The table presents the number of enterprises for all countries in the sample that are used for the empirical analysis.

Source: Own calculations.

Appendix B

Summary Statistics

	Mean	sd	min	p1	p50	p99	max
Credit	2.101	0.617	1	1	2	3	3
GDP	0.221	2.422	–9.1	–9.1	0.5	8.5	8.5
IR	3.465	0.770	1.927	1.927	3.3	6.045	6.045
Cbasset	9.853	35.422	–54.166	–54.166	2.777	108.137	108.137
ROA	–0.233	1.094	–9.531	–3.083	0.109	1.643	1.643
CAP	6.232	7.398	–10.573	–10.573	5.047	33.859	33.859
LendCap	2.097	3.518	–14.678	–14.678	2.915	6.596	6.874
LIQ	39.196	19.068	9.406	9.406	32.57	81.722	82.102
NPL	8.653	17.202	–19.681	–19.681	6.156	61.283	61.283
IIncome	1.411	0.390	0.992	0.992	1.273	2.970	2.970

Note: Table presents summary statistics of the dataset. sd refers to standard deviation, min to minimum value, max to maximum value, p1, p50, and p99 refer to the first percentile, median and the 99th percentile.

Source: Own calculations.

Appendix C

Pairwise Correlations

	Credit	GDP	IR	Cbasset	ROA	CAP	LendCap	LIQ	NPL	IIncome
Credit	1									
GDP	–0.153	1								
IR	0.130	–0.600	1							
Cbasset	–0.005	0.095	0.034	1						
ROA	–0.062	0.410	–0.350	–0.143	1					
CAP	0.041	–0.202	0.223	0.139	–0.366	1				
LendCap	–0.148	0.576	–0.513	–0.027	0.279	–0.247	1			
LIQ	–0.086	0.565	–0.415	–0.077	0.319	–0.353	0.322	1		
NPL	0.162	–0.762	0.600	–0.010	–0.390	0.294	–0.524	–0.652	1	
IIncome	0.103	–0.680	0.497	0.094	–0.441	0.363	–0.594	–0.698	0.619	1

Note: The table reports pairwise correlations for all variables.

Source: Own calculations.