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On the relationship between corruption and bank lending activity. European evidence

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Structured abstract

Purpose:

In the European context, the paper aims to uncover the effect of country-level perceptions of corruption on commercial banks' lending activity over two dimensions, the importance of loans and the quality of the loans portfolio.

Design/methodology/approach:

The paper uses publicly available country-level perceptions of corruption scores from Transparency International and individual bank-specific and macroeconomic data from the World Bank, and a sample of 640 commercial banks in 42 European countries from 2013 to 2019 to estimate, by OLS, the cross-sectional relationship between corruption and two variables: the importance of loans and the quality of the loan's portfolio. Several robustness tests reinforce the results.

Findings:

Results show that corruption negatively impacts the weight of loans in bank assets and positively impacts the proportion of bad loans. Moreover, European Monetary Union (EMU) membership reinforces the negative (positive) effect on loans (bad loans). In addition, trade openness increases the weight of loans and the weight of non-performing loans, and size, capital, and risk affect bank lending activity and the quality of loans.

Originality:

The paper addresses the impact of corruption on the lending activity of European commercial banks in the aftermath of two international financial crises when regulatory transformations in banking supervision occurred.

Research limitations/implications

Our results highlight the importance of fighting corruption to foster economic development. Transparency-oriented policies that seek to decrease the perception of corruption seem to promote economic development.

Keywords:

corruption; banks; loans; non-performing loans; Europe; lending activity

JEL classification:

G21, F30, E50

1. Introduction

Transparency International (TI) defines corruption as "the abuse of entrusted power for private gain" (https://www.transparency.org/en/what-is-corruption). In addition, TI discloses a measure of corruption, the Corruption Perceptions Index (CPI). The CPI scores and ranks countries and territories based on how corrupt experts and business executives perceive a country's public sector. Although CPI is not a specific measure of corruption in the banking sector, it provides a measure of (perceived) corruption in an important sector of the economy, whose decisions affect the allocation of resources. Most important, the CPI evolution over time shows the progress of a country in tackling corruption.

Concerning banks and their intermediation activity, corruption affects lending (Bahoo, 2020) and undermines the efficient allocation of resources. Corruption impairs debt recovery from borrowers, bribes result in higher loan costs (Weill, 2011a), and diverts funds from good projects to bad projects, decreasing loan portfolio quality (Park, 2012). Bad loans negatively affect economic growth (Park, 2012; Son *et al.*, 2020). This is the "sand in the wheels" hypothesis, contrary to the alternative "grease in the wheels", defending that paying bribes enhances the borrower's chance to obtain a loan (Weill, 2011a) and saves time during the funding process (Park, 2012).

The influence of corruption on lending activity has been studied in recent years at the country and bank levels. However, in the case of Europe, this issue must be explored further. Although one may consider EU countries transparent, Kukutschka (2021) alerts for the increased perception of corruption amongst the European population. Furthermore, the advent of the 2008 global financial crisis (GFC) and the sovereign debt crisis affected the balance sheets of banks and the quality of their credit portfolio. European authorities have implemented reforms to increase the competitiveness of the financial sector, and the Euro Area adopted the Single Supervisory Mechanism (SSM) in 2014. These events call for research into the determinants of the lending activity of European banks in a recent period.

Our paper focuses on the effect of corruption on the lending activity (loans and non-performing loans (NPL)) of European banks between 2013 and 2019.

Our study contributes to the literature on the relationship between corruption and the lending behaviour of banks by 1) testing the "sand in the wheels"/ "grease in the wheels" hypothesis for the case of European banks in the period after both crises, and 2) testing if EMU membership affected it.

Results show that corruption negatively affects the weight of loans in bank assets and positively affects the proportion of bad loans. An increase of one notch in the corruption index is associated with a significant decrease (increase) of 13.2 basis points (9.2 basis points) in the ratio of loans to assets (ratio of

NPL to loans). Moreover, European Monetary Union (EMU) membership reinforces the negative (positive) effect on loans (bad loans).

Next, the paper is organised as follows. Section 2 reviews the literature. Section 3 introduces the research design, detailing sampling procedures, data and variables, and estimation. Section 4 provides and discusses the results. Section 5 concludes.

2. Literature review

In Europe, banks play a significant role by financing investments and projects, enhancing growth, development, and the well-being of economic agents. The reversion of the disintermediation process following the global financial crisis contributed to a new emphasis on banks' lending activity.

The strand of literature that addresses the effect of corruption [1] on loans and the quality of loans puts forward two conflicting hypotheses: 1) the "sand in the wheels" hypothesis, which implies a negative relationship between corruption and bank credit, and 2) the "grease in the wheels" hypothesis, entailing a positive relationship between corruption and bank credit. Weill (2011a) summarises some arguments in favour of the "sand in the wheels" hypothesis: judicial corruption adds to uncertainty because the recovery of debt from the borrowers is problematic due to the malfunctioning of the legal institutions, and corruption in lending contributes to the increase in the costs of a loan, due to bribes. These support the argument that corruption hampers bank credit. On the other hand, Park (2012) advocates that corruption misallocates the available funds from regular projects to bad projects, causing the quality of loans to deteriorate and bringing economic growth down.

In favour of the alternative "grease in the wheels" hypothesis, Weill (2011a) argues that if borrowers want to obtain credit, they can pay bribes, especially if banks show strong risk aversion and are reluctant to lend. Weill (2011b) adds that, in that case, paying the bribe enhances the borrower's chance to obtain a loan. Furthermore, according to Park (2012), the bribe reduces the time it takes to review the quality of good projects, increasing the chances of the loans being granted. Therefore, corruption facilitates access to bank credit (Donatien, 2016).

Consequently, the debate on the relationship between corruption and loans (and bad loans) deserves empirical testing. Weill (2011a) concludes that corruption hampers credit at the country and bank levels in 2001-2005. Corruption also reduces the share of performing loans – it hampers good loans more than bad loans (Weill, 2011a). Park (2012) reinforces this conclusion in his cross-section study that uses country data from 76 countries between 2002 and 2004: corruption degrades bank soundness due

to the positive relationship between corruption and bad loans. Son *et al.* (2020) reach similar conclusions from 2004 to 2017 using data from 120 countries: corruption deteriorates the quality of banks' assets and undermines economic growth. Toader *et al.* (2018) confirm, for Central and Eastern European countries and the period 2005 to 2012, that a lower level of corruption is associated with fewer bad loans and moderate credit growth. Local public corruption is negatively associated with the bank lending activity of US banks (Bermpei et al., 2021). Finally, Donatien (2016) tests the case of the CEMAC countries, concluding that corruption hampers bank lending.

Bougatef (2016) performs a data panel study, with data from 22 emerging market economies for 2008-2012, with similar findings. He also estimates that the depth of credit information and the strength of legal rights contribute to reducing the effect of corruption on NPL, but only in countries with a low level of corruption. Kordbacheh and Sadati (2022) support that corruption has a negative impact on banking soundness.

For China, Chen *et al.* (2013) empirically confirm the "grease in the wheels" hypothesis: companies that pay higher bribes get more credit and display better performance. Considering data from 882 banks from different regions in Russia, Weill (2011b) finds that corruption hampers lending to households and firms but is not detrimental to bank lending to the government (due to lower informational asymmetries).

Corruption increases the proportion of bad-quality loans in the loan portfolio of banks. However, it improves the ability to charge higher interest rates on loans and to pay lower interest rates on deposits. Analysing the lending activity of European banks in a recent period, Asteriou *et al.* (2021) tested the impact of corruption on bank profitability in 448 banks from 19 Eurozone countries from 2000 to 2018. They find evidence that corruption harms bank profitability and stability in Eurozone countries.

Europe is a bank-based economy, which experienced relevant changes due to the globalisation, liberalisation, and integration processes in the last decades of the 20th century, as documented by Goddard *et al.* (2007). The 2007-2008 GFC and the sovereign debt crisis destabilised the banking and financial sector. In response to the mutually reinforced default risk between banks and governments, the Euro Area deepened the road to a Banking Union, creating the Single Supervisory Mechanism (SSM) in November 2014. The ECB ensures the supervision of the large and systemically relevant banks in the Euro Area. The other banks continue to be supervised by national supervisory authorities (NSA), following harmonised rules. Also, in these countries, the measures known as Basel III, introduced after the 2008 GFC, were adopted.

The changes in the Euro Area regulation following these crises, like the creation of the SSM, make an interesting case to test the "supervisory power view" against the "political/regulatory capture view" (Beck *et al.*, 2006). The former suggests that powerful supervisory agencies can reduce corruption in bank lending. The latter suggests that strong supervisory agencies can have adverse implications on the efficiency of credit allocation due to corruption and political ties that influence the distribution of bank loans.

Carboni *et al.* (2017) found that investors penalised the stock prices of banks with capital shortfall, which will be subject to SSM. They interpret this result as an expectation that the ECB will follow a more intrusive approach than the NSA and a fear of regulatory inconsistencies. On the other hand, Avignone *et al.* (2021), using data from 746 banks, argue that banks supervised by the SSM reduced their credit exposure compared to banks that the NSA supervised. Also, Fiordelisi *et al.* (2017) preview that banks supervised by the SSM, compared with those not subject to SSM, reduce their loans and their reserves for loan losses, suggesting the improvement of the quality of loan portfolios as an unintended consequence of the SSM.

Our research digs deeper into the relationship between corruption and bank lending activity in the European context. Asteriou *et al.* (2021) also studied the European case, focusing on bank profitability. We contribute to the literature by examining the lending behaviour of European banks after both crises and when those transformations in banking supervision occurred.

3. Research design

This paper aims to analyse the impact of corruption on the quantity and quality of bank loans stemming from their intermediation activity.

The source of bank-level data is Orbis Europe from the Bureau van Dijk, a Moodys' Analytics Company. The source of country-level macroeconomic data is the World Bank (WDI - World Development Indicators database), and the data on corruption is from the CPI 2019 database from Transparency International.

The study period covers the years from 2013 to 2019 because Transparency International underscores that a valid time series comparison of the CPI starts in 2012, and country-level coverage of Orbis Europe almost doubled from 2012 to 2013.

Equating the country coverage of the WDI database with that of the CPI database and adding the restriction of valid financial data availability during the period of study, namely the data for the dependent

variables calculation, yields a sample of 640 commercial banks from 42 European countries. Our maximum sample size is 4,480 observations per variable.

The two dependent variables, Loans and NPL, measure two complementary aspects of bank lending activity, quantity and quality. The first, Loans, following the work of Weill (2011a), is the ratio of loans to assets. The other, NPL, is the ratio of non-performing loans to total loans (e.g., Park, 2012; Bougatef, 2016).

The explanatory variable of interest measures the perceptions of corruption. Our chosen measure of corruption is the CPI from Transparency International. The CPI is a composite index, a combination of 13 surveys and assessments of corruption (see the Transparency International website https://www.transparency.org/en/cpi#). The CPI scores and ranks countries based on how corrupt experts and business executives perceive a country's public sector.

For ease of interpretation and following previous studies (e.g., Weill, 2011a, Park, 2012), we rescale the CPI score to vary between 0 and 100 so that the higher values represent a higher perception of corruption, by applying the following linear transformation:

$$RCPI_{j,t} = 100 - CPI_{j,t} \quad (1)$$

where $RCPI_{j,t}$ is the rescaled corruption index for country j at time t, and $CPI_{j,t}$ is the CPI for country j at time t, retrieved from the CPI 2019 database.

For robustness, we also test an alternative index of corruption provided by the World Bank, the Control of Corruption Index (CCI), from the Worldwide Governance Indicators (WGI) database. As this indicator ranges from -2.5 to 2.5, with the higher values meaning lower corruption, we also use a rescaled version ranging from 0 to 100, where a higher value indicates higher corruption, by applying the following linear transformation:

$$RCCI_{j,t} = 100 - [(CCI_{j,t}+2.5)/5]*100 \quad (2)$$

where $RCCI_{j,t}$ is the rescaled World Bank CCI for country j at time t, and $CCI_{j,t}$ is the CCI for country j at time t, retrieved from the WGI database.

Table I presents all the variables' definitions and the expected signs of the coefficients.

(Table I near here)

The analysis includes macroeconomic variables that affect banking activities (e.g., Weill, 2011a, Park, 2012, Toader *et al.*, 2018). GDP is the growth rate of GDP per capita, representing the economic environment. An increase in GDP growth rate contributes to bank credit growth because credit demand and supply are more intense. However, the consequences for loan quality could be clearer: a growing

economy contributes to better payment capacity and, therefore, to a smaller share of NPLs; however, if more bad loans arise, the effect can be the opposite.

The consumer price index growth rate measures Inflation. As inflation contributes to lower productivity levels, a negative effect on bank credit and the quality of loans is expected.

Following Beck *et al.* (2001) and Weill (2011a), we also control for the openness to trade (Trade), measured by the ratio of exports plus imports to gross domestic product. Openness is associated with competition and well-developed financial markets. Thus, a positive impact on lending activity is expected.

Moreover, we control for several bank-specific characteristics that impact lending activity (e.g., Weill, 2011a, and Son *et al.*, 2020). The log of total assets measures bank size (Size). Larger banks have a lower share of loans in their assets, which means better diversification (Weill, 2011a). The impact of size on NPL is ambiguous. The deposit-to-asset ratio indicates the banks' funding strategy (Funding). It can affect lending behaviour since banks with more funding through deposits have a stronger capacity to lend. Evidence about its effect on NPL is mixed. The ratio of overheads to assets measures operational efficiency (Efficiency). This variable effect is ambiguous (e.g., Son *et al.*, 2020). Higher funds allocated to monitoring loans can decrease the proportion of NPL. However, if higher costs are a sign of inefficiency, they can coexist with a high proportion of NPL. Finally, banks' asset liquidity (Liquidity) and capitalisation (Capital) have unclear impacts on lending behaviour: more liquidity and more capital are a sign of higher bank quality and less likelihood of a bank entering into risky behaviour. However, the more capital and liquidity banks have, the higher their capacity to take risks will be.

To account for the bank's risk aversion, we use the Z-score (Risk) (e.g., Asteriou *et al.*, 2021; Toader *et al.*, 2018). The Z-score is computed as the ratio of the sum of return on assets (ROA) and the level of capitalisation (equity/total assets) to the standard deviation of ROA (Laeven and Levine, 2009). Following Toader *et al.* (2018), we use a consecutive three-year rolling window to compute the standard deviation of ROA and use in the regressions the log transformation Ln(1+Z-score) to account for skewness and truncation. More risk-averse banks should lend less and have a higher aversion to NPL. Therefore, we expect negative signs in the estimated coefficients of this variable.

For estimation, we follow the examples in the literature (e.g., Weil, 2011a; Bougatef, 2016) and pool the data for all countries and years and estimate by OLS the following baseline model:

$$Y_{i,j,t} = \alpha + \beta \times Corruption_{j,t} + \Gamma \times Macro_{j,t} + \Omega \times Micro_{i,j,t} + \varepsilon_{i,j,t} \quad (3)$$

where, $Y_{i,j,t}$ is either Loans (in the percentage of total assets) or NPL (in the percentage of total loans) of the commercial bank i, from country j, at time t; $Corruption_{j,t}$ is either RCPI or RCCI of country j at time t; $Macro_{i,t}$ is a vector of country-level macroeconomic controls known to affect lending activity; and,

$Micro_{i,t}$ is a vector of bank-level controls. β is the coefficient of interest, measuring the impact of country-level perception of corruption on individual bank activity. Γ (Ω) is the vector of coefficients for the macroeconomic (bank-specific) control variables. To control for potential heteroscedasticity and autocorrelation, we report Newey-West robust standard errors.

Table II presents sample descriptive statistics.

(Table II near here)

As can be observed in Panel A of Table II, on average, total loans represent 56.5% of total assets, and the fraction of NPL amounts to about 12%. These figures compare reasonably well with the proportion of loans in Weill (2011a) and NPL in Park (2012).

Panel B of Table II presents pairwise correlations. Amongst the explanatory variables, the most relevant correlation is between Inflation and GDP (-0.468) and between Liquidity and Capital (0.422). In all subsequent empirical work, we check for possible multicollinearity issues using Variance Inflation Factors (VIF), and the estimated VIFs are typically below the maximum of 2.50 for GDP and Inflation.

4. Results

This section presents and discusses our results. We begin with our baseline findings on loans and NPL. Next, we test the robustness of our results. Finally, we conclude with additional tests concerning EMU membership and subsample evidence.

4.1 Corruption, lending activity, and the quality of loans

Table III presents the main results concerning lending activity. They strongly corroborate, for European banks, the "sand in the wheels" hypothesis.

(Table III near here)

As can be seen in the specification (1) of Table III (the univariate test), an increase of one notch in a given country's corruption index is associated with a statistically significant decrease of 13.7 basis points in the weight of loans in the assets of that country's banks. When all control variables are considered, see specification (4) of Table III (the multivariate test), the effect remains statistically significant and with comparable economic importance (13.2 basis points).

The estimated coefficients of the bank-specific and macroeconomic control variables are qualitatively similar across the different specifications. Concerning the macroeconomic controls, the GDP variable's negative sign corroborates Weill's (2011a) results. On the other hand, the trade variable exerts

a positive and significant effect on loans, suggesting that banks value the funding of external trade projects more than domestic projects.

The estimated coefficients of the bank-specific controls are also similar across the models. Size has a positive and significant effect on loans, just as Capital and Risk. The signs of the coefficients suggest that bigger, well-capitalized, and risk-averse banks do allocate more resources to lending. More liquid banks and banks that rely more on deposits (similar to Weill (2011a)) show a lower propensity to lend.

Table IV presents the baseline results of the quality of loans. Again, contrary to the previous evidence for the importance of loans, an increase in the perception of nationwide corruption is associated with an increase in the weight of non-performing loans.

(Table IV near here)

As specification (4) in Table IV shows, a rise of one notch on the corruption index increases the ratio of NPL by 9.2 basis points. This result remains statistically significant in all specifications.

The estimated coefficients of the macroeconomic variables are not significant except for the Trade variable, which is positive. This result suggests that an increase in countries' openness to international trade deteriorates the quality of loans, possibly as a reflection of monitoring difficulties faced by banks due to increased information asymmetries and growing lending activity (see Table III).

As for the estimated coefficient for the bank-specific controls, Size and Risk have a negative and significant effect on NPL and Efficiency. Therefore, larger banks have fewer NPL, which can be explained by a strong capacity to assess the quality of the projects they fund. As expected, banks more averse to risk have a lower proportion of NPL in their loan portfolio. This is also the case for more efficient banks, suggesting they better assess borrower quality. The estimated coefficient of the Capital variable is positive and significant, which indicates that well-capitalized banks have a greater capacity to take risks.

These results suggest that an increased nationwide perception of corruption makes it more difficult for companies to obtain bank financing, which hinders corporate growth and development. Transparency-oriented policies that seek to decrease the perception of corruption seem to foster economic development. Moreover, the results suggest that banks face increased credit risks in corruption-prone environments.

4.2 Robustness tests

Table V shows two robustness tests. In specifications (1) and (3), we use the rescaled CCI from World Bank as the variable of interest and estimate equation (3) by OLS using pooled data. Specifications (2) and (4) resume the RCPI from Transparency International for measuring corruption and estimate equation (3)

using one-year-lagged independent variables to document explanatory causality better and address the issues of endogeneity and autocorrelation.

(Table V near here)

Results are qualitatively and statistically robust. The pervasive effects of increased corruption, hampering lending activity, and increasing bad loans characterise the European evidence. Moreover, when the CCI (rescaled) measures corruption (specifications (1) and (3) of Table V), the coefficient estimates are of qualitatively similar magnitude. The increase of one notch in corruption is associated with a decrease of about 13 basis points in the weight of loans in banks' balance sheets and with an increase of about nine basis points in the proportion of NPL. Additionally, when the CPI (rescaled) measures corruption and model 3 is estimated using lagged explanatory variables, we find an even more economically important negative impact of corruption on lending activity (up to 13.4 basis points) and a positive impact on NPL of similar magnitude (8.5 basis points), comparing with the baseline specification.

Overall, the estimated coefficients of the macroeconomic and bank-specific variables retain their sign, although with lower significance. These results corroborate the "sand in the wheels" hypothesis applied to the lending behaviour of European banks in the period 2013-2019.

4.3 Additional tests

Table VI presents three additional tests. First, in columns under "EMU dummy", we test the impact of EMU membership using a dummy variable approach. We add to model (3) a variable that equals the product of CPI (rescaled) times EMU, where EMU is a dummy variable that equals one if a country is a member of the EMU and zeroes otherwise. We prefer this interaction effect to an intercept effect because we are mainly interested in testing the impact of EMU membership on the relationship between corruption and lending. Moreover, the EMU dummy and the interaction variable EMU*RCPI are highly collinear (correlation of 93.6%), thus rendering the estimation unfeasible if considered both simultaneously.

Second, in columns under "EMU subsample", we select only banks from the EMU (we keep a maximum of 1,526 observations per variable, corresponding to 218 commercial banks). The perception of corruption in EMU countries is low compared to other countries. The average CPI (rescaled) is 37.81 for EMU countries, while the average CPI (rescaled) is 54.30 for the remaining countries, a statistically significant difference at the 1% level. Moreover, banks from EMU countries are subject to harmonised supervisory rules. Under the SSM, since the end of 2014, the ECB has supervised large and systemically relevant banks.

Third, in columns under "Exc-Russia subsample", we exclude all banks from Russia (we keep a maximum of 3,423 observations per variable corresponding to 489 commercial banks), as they alone account for 23.6% of our sample, by large, the most represented country (the second most represented country is Italy, with 7.8% of all banks).

(Table VI near here)

Concerning the first additional test, the interaction of EMU membership with Corruption, we notice that the overall effect of increased perceptions of corruption on lending activity (quality of loans) is negative (positive), even when EMU membership is controlled. Most interesting, the results suggest that EMU membership tends to increase the negative effect of corruption on Loans and corroborate an increased positive impact of corruption on NPL.

Next, we look at subsamples. As expected, given the results of the interaction effect, in the EMU subsample, the impact of corruption on lending activity seems economically more important than the overall result. The RCPI coefficient in the EMU subsample column under Loans in Table VI is -15.4 basis points, while the overall effect is -13.2 basis points (column (4) in Table III). Likewise, the impact of corruption on NPL also seems economically more important in the EMU subsample. The coefficient for RCPI in the EMU subsample column under NPL in Table VII is 26.8 basis points, while the equivalent overall result is 9.2 basis points (see column (4) in Table IV). In highly regulated and closely supervised environments, such as the EMU, corruption does seem to exert a more significant impact on lending, as corruption may be less prevalent.

Excluding Russia (Exc-Russia subsample columns), the overall results remain qualitatively similar for the negative impact of corruption on loans (about -12.4 basis points, see column Exc-Russia subsample under Loans in Table VI), and with an increased impact in NPL (up to 16.8 basis points, see column Exc-Russia subsample under NPL in Table VI).

5. Conclusion

Perceptions of increased corruption countrywide may foster or hamper lending activity. On one side, the "sand in the wheels" hypothesis suggests that increased difficulties in recovering impaired loans or the increased cost of credit may hamper lending activity. Conversely, the "grease in the wheels" hypothesis suggests that corrupt environments foster loan applications, even by troubled borrowers.

Our results show that corruption in Europe hampers lending by commercial banks and contributes positively to the importance of bad loans. These results are reinforced in the highly regulated and closely

supervised group of EMU countries. In this small group of countries, as corruption may be understood as more unlikely, its consequences are more significant when it does occur.

Our results highlight the importance of fighting corruption to foster economic development. To the extent that commercial bank loans promote economic growth, less corruption facilitates lending and reduces the risk of granting bad loans, thus enabling more favourable credit terms.

Since our sample period occurs in the aftermath of a major international financial crisis and before the Covid-19 pandemic crisis, the impact of an increase in systematic risks is not addressed and remains open to further research. The adverse effects of corruption may counteract government recovery policies. Likewise, the impact of bank-specific corruption on the nature of the banking relationship and the development of the customer basis of banks is also an issue that should be looked into further. For example, bribery may emerge as a mechanism to overcome the hold-up problems associated with relationship lending.

Notes

1. The literature also addresses the causes of corruption, like the lack of competition (Ades and Di Tella, 1999) or social norms (Barr and Serra, 2010). Barth et al. (2009) defend that greater competition among banks and information sharing by banks decrease the effect of corruption on lending.

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Table I.

Variables definition

Variable	Definition	Source	Expected relation		References
			Loans	NPL	
Loans	Loans to Assets (in %)	Orbis			Weill (2011a)
NPL	NPL (in %)	Orbis			Park (2012)
RCPI	CPI (rescaled)	TI	-	+	Weill (2011a); Park (2012)
RCCI	Control of Corruption (rescaled)	WB	-	+	Weill (2011a); Park (2012)
GDP	GDP per capita annual growth (in %)	WB	+	+/-	Park (2012); Son *et al.,* (2020); Donatien (2016); Goel and Hasan (2011)
Inflation	Consumer Price Index annual growth (in %)	WB	-	+	Weill (2011a); Park (2012); Donatien (2016);
Trade	Exports plus imports in % of GDP	WB	+ (non-sig)	?	Weill (2011 a)
Size	Total Assets (in logs)	Orbis	-	-/+	Weill (2011a); Toader *et al.* (2018)
Capital	Equity to Assets (in %)	Orbis	-	-/+	Son *et al.* (2020); Donatien (2016)
Funding	Deposits to Assets (in %)	Orbis	+	+/-	Weill (2011a); Toader *et al.* (2018)
Liquidity	Net Assets to Total Assets (in %)	Orbis	?	-/+	Son *et al.* (2020)
Efficiency	Overheads to Assets (in %)	Orbis	?	-/+	Son *et al.* (2020)
Risk	Z-score (in logs)	Orbis	-	-	Toader *et al.* (2018)

Notes: Variable refers to the mnemonic used to identify each variable computed as described under Definition. Source is the database where we collect the raw data. Orbis refers to the Orbis Europe database from Bureau Van Dijk, a Moody's Analytics Company, TI refers to the CPI2019 database from Transparency International, WB is the World Bank (Worldwide Governance Indicators database for the CCI and World Development Indicators database for the remaining data). Expected relation refers to the sign of the predicted association of the variable in each line to Loans or NPL, either positive (+), negative (-), non-significant (non-sig), or unknown (?). The references under References are not exhaustive.

Table II.

Sample description

	Loans	NPL	RCPI	GDP	Inflation	Trade	Size	Capital	Funding	Liquidity	Efficiency	Risk
Panel A: Descriptive Statistics												
N	4,480	4,480	4,480	4,480	4,474	4,480	4,480	4,480	4,431	4,456	4,473	3,190
Scale	%	%	0 to 100	%	%	%	Log	%	%	%	%	Log
Mean	56.545	11.983	48.684	1.616	3.556	83.419	22.908	14.564	63.872	40.796	4.068	3.614
Stdev	19.674	15.719	20.410	2.331	5.676	40.235	2.409	11.234	20.375	43.567	8.820	1.223
Panel B: Correlation												
Loans	1.000											
NPL	-0.108	1.000										
RCPI	-0.143	0.202	1.000									
GDP	0.004	-0.022	-0.097	1.000								
Inflation	-0.044	0.133	0.467	-0.468	1.000							
Trade	0.143	0.021	-0.296	0.339	-0.140	1.000						
Size	0.077	-0.171	-0.101	0.036	-0.046	0.031	1.000					
Capital	-0.186	0.253	0.367	-0.032	0.263	-0.161	-0.302	1.000				
Funding	0.020	-0.024	0.086	0.141	-0.018	0.183	-0.106	-0.264	1.000			
Liquidity	-0.486	0.095	0.090	-0.034	0.066	-0.163	-0.057	0.422	-0.324	1.000		
Efficiency	-0.087	0.090	0.153	-0.015	0.113	-0.029	-0.128	0.197	0.009	0.083	1.000	
Risk	0.114	-0.240	-0.258	0.047	-0.142	0.105	0.010	-0.003	-0.068	-0.027	-0.082	1.000

Notes: Panel A provides descriptive statistics, and Panel B presents the pairwise Pearson correlation coefficients (variable in the row and variable in the column). Variable is the mnemonic used to identify each variable (see Table I). N is the number of observations, Scale is the measurement scale, Mean is the overall average, and Stdev is the overall standard deviation.

Table III.

Lending and corruption

	(1)		(2)		(3)		(4)	
Variable	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Constant	63.235	58.53 ***	65.451	12.22 ***	57.250	34.59 ***	63.966	11.66 ***
RCPI	-0.137	-7.09 ***	-0.130	-5.25 ***	-0.107	-4.63 ***	-0.132	-4.73 ***
Size			0.393	2.28 **			0.388	2.22 **
Capital			0.145	1.80 *			.0136	1.66 *
Funding			-0.120	-4.03 ***			-0.127	-4.18 ***
Liquidity			-0.219	-5.97 ***			-0.217	-5.93 ***
Efficiency			-0.037	-0.94			-0.041	-1.02
Risk			0.829	2.70 ***			0.830	2.69 ***
GDP					-0.413	-2.45 **	-0.005	-0.02
Inflation					0.008	0.11	0.108	1.11
Trade					0.062	6.11 ***	0.021	1.87 *
N		4,480		3,150		4,474		3,144
R^2(adj)		0.020		0.272		0.033		0.274
F-stat		92.91 ***		169.39 ***		38.78 ***		119.77 ***

Notes: The table provides coefficient (Coeff) estimates of equation (3), where Loans is the dependent variable. Specification (1) only considers the CPI (rescaled) measure of corruption. Specification (2) adds to the model the bank-specific controls. Specification (3) evaluates the macroeconomic determinants. Finally, specification (4) considers the complete baseline model. Table I shows variable definitions. N is the number of observations, R^2(adj) is the adjusted r-squared, and F-stat is the overall F test of significance. All t-statistics (t-stat) are estimated with heteroscedasticity and autocorrelation robust standard errors using the Newey-West correction with one lag. Asterisks flag significance levels at 10% (*), 5% (**), and 1% (***).

Table IV.

Loan quality and corruption

	(1)		(2)		(3)		(4)	
Variable	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Constant	4.411	7.16 ***	32.931	8.56 ***	0.870	0.90	30.286	7.89 ***
RCPI	0.156	11.06 ***	0.079	4.36 ***	0.160	9.66 ***	0.092	4.56 ***
Size			-0.788	-6.16 ***			-0.825	-6.28 ***
Capital			0.187	4.46 ***			0.172	3.98 ***
Funding			-0.001	-0.03			-0.017	-0.94
Liquidity			0.007	0.91			0.011	1.29
Efficiency			-0.030	-1.94 *			-0.037	-2.35 **
Risk			-2.789	-9.67 ***			-2.797	-9.71 ***
GDP					-0.084	-0.56	-0.004	-0.02
Inflation					0.120	1.30	0.112	1.10
Trade					0.036	4.49 ***	0.044	5.28 ***
N		4,480		3,150		4,474		3,144
R^2(adj)		0.041		0.132		0.049		0.145
F-stat		190.42 ***		69.94 ***		58.88 ***		54.35 ***

Notes: The table provides coefficient (Coeff) estimates of equation (3), where NPL is the dependent variable. Specification (1) only considers the CPI (rescaled) measure of corruption. Specification (2) adds to the model the bank-specific controls. Specification (3) evaluates the macroeconomic determinants. Finally, specification (4) considers the complete baseline model. Table I shows variable definitions. N is the number of observations, R^2(adj) is the adjusted r-squared, and F-stat is the overall F test of significance. All t-statistics (t-stat) are estimated with heteroscedasticity and autocorrelation robust standard errors using the Newey-West correction with one lag. Asterisks flag significance levels at 10% (*), 5% (**), and 1% (***).

Table V.

Robustness tests - corruption index and regression on lagged variables

	Loans				NPL			
	(1)		(2)		(3)		(4)	
Variable	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Constant	63.300	11.57 ***	65.949	13.94 ***	30.869	8.06 ***	30.423	8.89 ***
RCCI	-0.131	-4.92 ***			0.087	4.58 ***		
RCPI (lag)			-0.134	-5.68 ***			0.085	4.03 ***
Size	0.386	2.21 **			-0.822	-6.27 ***		
Size (lag)			0.343	2.24 **			-0.835	-5.98 ***
Capital	0.138	1.69 *			0.173	4.02 ***		
Capital (lag)							0.134	2.99 ***
Funding	-0.125	-4.14 ***			-0.017	-0.94		
Funding (lag)			0.070	0.88			-0.021	-1.03
Liquidity	-0.217	-5.94 ***			0.011	1.31		
Liquidity (lag)			-0.230	-5.93 ***			0.011	1.07
Efficiency	-0.041	-1.02			-0.036	-2.37 **		
Efficiency (lag)			-0.059	-1.46			-0.037	-1.86 **
Risk	0.821	2.66 ***			-2.02	-9.74 ***		
Risk (lag)			0.838	3.00 ***			-2.346	-8.01 ***
GDP	0.025	0.11			-0.011	-0.06		
GDP (lag)			0.187	0.83			-0.330	-2.13 **
Inflation	0.122	1.26			0.110	1.07		
Inflation (lag)			0.089	0.91			0.158	1.58
Trade	0.020	1.77 *			0.044	5.36 ***		
Trade (lag)			0.017	1.67 *			0.038	4.53 ***
N		3,144		2,520		3,144		2,520
R^2(adj)		0.275		0.273		0.145		0.139
F-stat		120.29 ***		28.76 ***		54.31 ***		33.01 ***

Notes: The table provides coefficient (Coeff) estimates of equation (3). Columns under "Loans" ("NPL") refer to the dependent variable loans-to-assets ratio (non-performing loans-to-total loans ratio). Columns (1) and (3) consider the CCI (rescaled) measure of corruption. Columns (2) and (4) consider Transparency International's CPI and use lagged explanatory variables. Table I presents variable definitions. N is the number of observations, R^2(adj) is the adjusted r-squared, and F-stat is the overall F test of significance. All t-statistics (t-stat) are estimated with heteroscedasticity and autocorrelation robust standard errors using the Newey-West correction with one lag. All z-statistics (z-stat) are computed using robust standard errors. Asterisks flag significance levels at 10% (*), 5% (**), and 1% (***).

Table VI.

Additional tests - EMU membership dummy and sub-samples

	Loans						NPL					
	EMU dummy		EMU subsample		Exc-Russia subsample		EMU dummy		EMU subsample		Exc-Russia subsample	
Variable	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Constant	67.432	11.20 ***	92.478	12.40 ***	69.676	11.01 ***	25.590	5.70 ***	10.932	1.82 *	22.481	5.29 ***
RCPI	-0.127	-4.53 ***	-0.154	-2.60 ***	-0.124	-3.92 ***	0.086	4.13 ***	0.268	6.87 ***	0.168	6.89 ***
EMU*RCPI	-0.036	-1.44					0.049	2.29 **				
Size	0.287	1.58	-0.276	-1.09	0.074	0.38	-0.689	-4.57 ***	-0.110	-0.52	-0.533	-3.64 ***
Capital	0.112	1.31	-0.204	-1.40	-0.052	-0.50	0.205	4.38 ***	0.358	2.59 ***	0.314	5.79 ***
Funding	-0.136	-4.30 ***	-0.216	-5.98 ***	-0.124	-3.74 ***	-0.005	-0.26	0.020	0.85	0.016	0.83
Liquidity	-0.217	-5.94 ***	-0.460	-10.66 ***	-0.211	-4.63 ***	0.012	1.38	-0.035	-2.76 ***	-0.004	-0.51
Efficiency	-0.041	-0.98	0.002	0.18	-0.017	-0.75	-0.037	-2.56 **	-0.024	-2.68 ***	-0.014	-1.48
Risk	0.857	2.77 ***	1.225	2.66 ***	1.439	4.26 ***	-2.834	-9.81 ***	-2.930	-6.75 ***	-2.995	-9.85 ***
GDP	-0.087	-0.37	0.264	0.59	0.158	0.70	0.106	0.61	0.154	0.96	-0.472	-2.59 ***
Inflation	0.060	0.60	0.446	0.75	0.166	1.73 *	0.177	1.67 *	-2.196	-3.94 ***	0.018	0.17
Trade	0.024	2.14 **	0.036	2.05 **	0.022	1.83 *	0.039	4.63 ***	0.005	0.62	0.017	2.29 **
N		3,144		1,071		2,394		3,144		1,071		2,394
R^2(adj)		0.275		0.459		0.247		0.147		0.269		0.201
F-stat		109.29 ***		91.59 ***		79.36 ***		50.36 ***		40.45 ***		61.35 ***

Notes: The table provides coefficient (Coeff) estimates of equation (3) using Transparency International's CPI, rescaled (RCPI) to measure corruption. Columns under Loans (NPL) refer to the dependent variable loans-to-assets ratio (non-performing loans-to-total loans ratio). Columns under "EMU dummy" add to model (3) the variable resulting from the product of EMU times RCPI. EMU is a dummy variable that equals one if the bank is from an EMU country and zero otherwise. Columns under "EMU subsample" ("Exc-Russia subsample") consider banks from the EMU (all countries except Russia). Table I provides variable definitions. N is the number of observations, R^2(adj) is the adjusted r-squared, and F-stat is the overall F test of significance. All t-statistics (t-stat) are estimated with heteroscedasticity and autocorrelation robust standard errors using the Newey-West correction with one lag. Asterisks flag significance levels at 10% (*), 5% (**), and 1% (***).