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IMF Working Paper

Can Good Governance Lower Financial Intermediation Costs?

by Mariusz Jarmuzek and Tonny Lybek

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European Department

Can Good Governance Lower Financial Intermediation Costs?

Prepared by Mariusz Jarmuzek and Tonny Lybek*

Authorized for distribution by Khaled Sakr

December 2018

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Abstract

This paper argues that better governance practices can reduce the costs, risks and uncertainty of financial intermediation. Our sample covers high-, middle- and low-income countries before and after the global financial crisis (GFC). We find that net interest margins of banks are lower if various governance indicators are better. More cross-border lending also appears conducive to lower intermediation costs, while the level of capital market development is not significant. The GFC seems not to have had a strong impact except via credit risk. Finally, we estimate the size of potential gains from improved governance.

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I. INTRODUCTION

This paper examines whether financial intermediation costs of banks are influenced by the quality of governance across countries and over time. Following the global financial crisis (GFC) in 2008, banks' net interest margins (net interest income to interest-earning assets: NIM) have received renewed attention (e.g., Burke and Garcia, 2017). They are typically employed as a good proxy for financial intermediation costs and efficiency, which are critical factors for supporting economic growth (Levine, 1997 and 2005). In principle, competition among banks should help reduce bank margins to levels constrained by expenses, risks and uncertainty.¹ This paper aims at explaining cross-country variations in the NIM by differences in governance quality, while controlling for banking sector characteristics and macroeconomic indicators.²

The paper intends to fill some gaps in the literature. First, it merges various strands of literature on determinants of financial intermediation costs with the literature on the role of governance. It focuses on financial intermediation costs (price effects) as opposed to financial deepening (volume effects). Second, many of the empirical studies cover the period until the early 2000s, whereas this study also covers the post-GFC period (structural break). Third, the set of countries is large and includes advanced, emerging and developing economies. Fourth, compared to other studies, a broader set of governance indicators is examined. Fifth, various datasets are merged that shed light on features associated with international financial interconnectedness and capital market financing. Sixth, simulations quantifying potential gains of good governance in terms of financial intermediation costs are conducted. Finally, these findings should, in principle, help guide theoretical governance models that suggest opposing effects (see, for instance, Jappelli et al., 2005).

Our prior is that costs, risks and uncertainty caused by poor governance will ultimately be passed on to the customers and will hamper efficient financial intermediation and thus sustainable economic growth. Governance is a complex concept (e.g., Bevir, 2013). In this paper, *good* governance refers to legislation, formal and informal rules governing behaviors of society, institutions, organizations, firms, individuals, as well as networks and markets supporting the achievement of the official objective(s) of these entities. Such practices thus alleviate market-, public- and private-sector failures by lowering costs, risks,

¹ We follow Knight's (1921) definition of risk and uncertainty. While the probabilities of risks are known and can largely be hedged, uncertainty relates to more rare and unexpected events that cannot be hedged.

² It is outside the scope of this paper to investigate whether governance quality, in addition to financial intermediation costs, also affects lending maturities, collateral requirements, etc. See, for example, Bae and Goal (2009) for such an analysis. We do not investigate intra-country heterogeneity (e.g. the impact of governance quality depending on bank ownership), as we use country-level rather than bank-level data. See, for instance, Fungáčová and Poghosyan (2011) for such an analysis. A different approach would have been to gauge the impact of the quality of institutions and good governance on sovereign spreads. See, for example, Akitoby and Stratmann (2010) for such an analysis.

and uncertainty.³ Our focus is on governance in a broad context, like the effectiveness and efficiency of the legislative, executive and judiciary branches of government in order to improve the welfare and wealth of society.⁴ These factors obviously affect the behavior of individuals, non-financial corporations and banks, albeit somewhat distinct from the more specific *G20/OECD (2015) Principles of Corporate Governance* and the *BIS (2015) Corporate Governance Principles for Banks*. Corruption is often associated with, and is an important element of, poor governance (Shleifer and Vishny, 1993). However, poor governance can exist without corruption.⁵ Public governance practices—like property rights, the rule of law, efficient institutions, predictable contract enforcement, etc.—spill-over to private sector behaviors. For instance, good public governance practices are conducive to a healthier credit culture. Both lenders and borrowers are then driven by *enlightened* self-interest as the scope for *pure* self-interest (i.e., opportunistically exploiting information asymmetries and poor contract enforcement) diminishes.

In our investigation, we merge various strands of literature on determinants of financial intermediation costs with the literature on governance. Both theoretical and empirical studies suggest that elements of better governance—for instance effective institutions and less corruption—are positively correlated with higher per capita income (e.g., Mauro, 1995; Tanzi and Dawoodi, 2001), more efficient government spending, and greater financial deepening (e.g., Demirgüç-Kunt and Huizinga, 1999; Djankov et al., 2007; and Al Masry and Pedroni, 2016). However, instead of focusing on financial deepening (the quantity effect) we focus on financial intermediation costs (the price effect). Financial deepening likely reflects accumulated past price effects. In identifying factors shaping financial intermediation costs, we broadly follow the literature on determinants of NIM and efficiency of banks,⁶ which hinges on the bank-dealership model developed by Ho and Saunders (1981). Our empirical

³ Good governance is akin to the concept of *social cost* (Coase, 1960), *good institutions* (North, 1981, 1989; Acemoğlu, 2005; Acemoğlu and Robinson, 2008, 2012); *social capital* (Coleman, 1988; Knack and Keefer, 1997); *social infrastructure* (Hall and Jones, 1999); and *social capability* (Putterman, 2013). It is underpinned by social norms, ethics, and morals. It reduces transaction costs, including information costs. It alleviates negative externalities, market- and public-sector failures, and is conducive to enhancing the number of state-contingent markets. The latter permits further division of labor as well as risk diversification. Ultimately, *enlightened* self-interest (as discussed by Tocqueville, 1835) induces trust, which bestows more predictable outcomes, when reacting to unexpected shocks. Fukuyama (1995, p. 27) notes that “The legal apparatus, serving as a substitute for trust, entails what economists call “transaction costs”. Or as Arrow (1974, p. 23) noted: “Trust is an important lubricant of a social system.” In short, good governance enhances both output and stability. (See Annex Tables 2.1.1–3 in IMF 2017 for an overview of the theoretical and empirical literature.)

⁴ Evidently, a fair and free media is also important to ensure informed decisions as well as to advance checks and balances in both the government and private sector. Houston et al. (2011), for example, found that state-ownership of the media and media concentration were associated with more corruption in bank lending.

⁵ There are various definitions of corruption (UN, 2004; OECD, 2013; IMF, 2018). For the purpose of this paper, we use the following definition: “abuse of position to solicit an illicit gain.”

⁶ There are other proxies to measure efficiency of banks, like non-interest costs to total income (often called the “efficiency ratio”) or relative to total assets. However, non-interest costs will have to be covered by fee income and the NIM for a bank to remain profitable.

approach largely follows Demirgüç-Kunt and Huizinga (1999) and Demirgüç-Kunt et al. (2004).

We test if better governance practices do reduce NIM, and whether the impact changed after the GFC. Most similar cross-country empirical studies precede the GFC and cover smaller samples. A notable exception is the study by Poghosyan (2013), but it focuses on low-income countries and covers until 2010; before the GFC ended. Our database covers 100 countries spanning the period 1996 to 2015, although it is unbalanced across country and time dimensions. In line with the benchmark theoretical model, we find that countries with higher operating costs, risk aversion, and credit risk tend to have higher margins, while those with higher transaction size, i.e. more financial deepening, have lower margins. Consistent with the literature, we also find that various aspects of good governance significantly reduce NIM. The impact of the GFC on NIM appears to have worked mainly through credit risk. It has not led to a structural break in the relationship between governance and NIM.

Our investigation also sheds light on features associated with international financial interconnectedness and capital market development. While we observe that more financial openness seems to reduce NIM of banks, likely due to more competition, the results for the size of capital market financing are not significant. The latter finding is possibly because although good governance is expected to be conducive to capital market financing, it may also facilitate efficient bank intermediation.

Finally, we estimate potential gains from better governance and institutions for various country groups in order to draw policy conclusions. If governance improves to the top 10 percent threshold, the NIM would decline on average by about 1 percentage point for low-income countries and by about 0.3 percentage point for high-income countries. This difference is expected because high-income countries typically already have good governance, which reduces the scope for further gains. The “gains” in percent of GDP, however, are almost inverse, due to the greater size of bank intermediation (financial deepening) in high-income countries.

The rest of the paper has three main parts. Section II provides a basic conceptual framework. Section III presents the empirical analysis. It describes the data, empirical approach and results. Section IV provides some simple illustrative estimates of the costs of poor governance. Section V offers a brief conclusion.

II. CONCEPTUAL FRAMEWORK: NET INTEREST MARGINS AND GOVERNANCE

The bank-dealership model (Ho and Saunders, 1981) considers banks to be risk averse, while intermediating deposits and loans. Credit institutions aim to maximize the expected net present value for their owners, while giving due consideration to risks and uncertainties. Their core activity is accepting deposits and extending loans to the general public. The bank maximizes its expected net present value by adjusting its spread on deposits and loans

compared to the risk-free interest rate, as compensation for risks and uncertainty associated with mismatches between deposits and loans.

The model makes four general predictions, focussing on banking sector characteristics.

First, banks that are able to exercise monopoly power can demand a greater spread compared to those operating in a more competitive market structure. Second, banks that have a higher risk aversion are likely to be better capitalized and are perceived as more solvent. In principle, this should reduce their funding costs and, thus, increase their margins. Third, given credit and market risks, the average transaction size should exert some impact on the margin due to returns to scale. Fourth, the more volatile interest rates, the greater the market risk and, therefore, the higher is the risk premium required by banks. These results have been broadly confirmed by empirical evidence, including by Ho and Saunders (1981) for US banks and by Saunders and Schumacher (2000) for banks in seven OECD countries.

A. Banking Sector Factors

The bank-dealership framework has been extended and operationalized. For example, Allen (1988) introduced heterogeneous loans and Angbazo (1997) confirmed that the greater the uncertainty about granted loans, the greater the margin. Credit risk is often measured by the non-performing loan (NPL) ratio, provisions, or the provision coverage ratio. Maudos and Fernandez de Guevara (2004) incorporated several factors, including operating costs. The higher these costs, which may reflect inefficiencies related to poor governance, the higher the margin. The empirical evidence by Angbazo (1997) and Maudos and Fernandez de Guevara (2004) also suggested a negative relationship between the transactions size and margins, due to the economies of scale. Transaction size is often measured as bank credit to the private sector.

Different proxies are used to capture competition and risk aversion. Increased competition (less concentration) tends to lower margins, unless concentration is achieved through higher efficiency (Kasman and Corvallo, 2014). Often either the Herfindahl-Hirschman index or the share of the assets, deposits or loans of the five or three largest banks is used to measure concentration.⁷ Risk aversion is commonly proxied by the capital adequacy ratio and is frequently found to be positively associated with the NIM. Better capitalized banks are in principle less risky, which in turn should reduce their funding costs and consequently improve their interest margins. However, more capital is costly, as it reduces the leverage effect and may thus require a higher margin. Furthermore, a high capital ratio could incentivize banks to accept bigger risks.

⁷ Bank concentration and competitiveness remain widely debated. Claessens and Laeven (2004), for example, argue that having contestable systems with a constant threat of entry, including from foreign banks, is more important for competition than low concentration. Based on a cross-country study, they found low correlation between the Panzar-Rosse (PR) index for bank competition and traditional measures, like the Herfindahl-Hirschman index and share of the largest banks.

B. Governance Factors

The literature has examined the link between various aspects of governance and bank intermediation costs. For instance, Jappelli et al. (2005) develop a theoretical model predicting that an improvement in contract enforcement increases aggregate lending by opening the credit market to borrowers with little collateral. Improvements in institutional quality increase the value of collateral, hence reducing the cost and risk of financial intermediation. There is also an opposing effect. Better governance and lower margins may reduce credit rationing, which could result in higher debt levels, including to less qualified borrowers. If banks have market power, they can increase the lending rate to account for this. But if there is strong competition, the model shows that the system could be more prone to instability.⁸

Empirical studies have confirmed that better governance, institutions and credit culture tend to lower financial intermediation costs and enhance financial deepening This has been documented by Demirgüç-Kunt and Huizinga (1999), Demirgüç-Kunt et al. (2004), and Poghosyan (2013) for different groups of countries. The governance proxies typically capture property rights, rule of law, legal system, regulatory quality, effectiveness of the executive branch,⁹ and efficiency of the judiciary. Corruption is more complicated, as it can affect all the steps in the intermediation process. Generally, it tends to increase intermediation costs,¹⁰ constrain efficient lending,¹¹ and increase credit risk (e.g., Goel and Hasan, 2011).¹² Some models, however, like Weill's (2011), which uses "grease-the-wheels" argument, predicts that corruption in some cases can boost lending, particularly if banks are very risk averse. Relying on patronage and informal enforcement mechanisms that bypass the conventional ones are likely second-best solutions in the absence of good governance.

⁸ However, more predictable enforcement could also imply better information about risky borrowers' track record. In principle, this would reduce the credit rationing caused by imperfect and asymmetric information (Stiglitz and Weiss, 1981). In our view, the effect could potentially be mitigated by better screening and monitoring, which does not seem to be fully captured by the model.

⁹ The quality of banking supervision deserves special attention, but it is outside the scope of this paper. It is covered in other papers such as Beck, Demirgüç-Kunt and Levine (2006), Chortareas et al. (2012), and Barth et al. (2013).

¹⁰ See, among others, Demirgüç-Kunt and Huizinga (1999), although they find that the effect is weaker in wealthier countries, and Poghosyan (2013).

¹¹ See, for instance Beck et al. (2006) and Akins et al. (2017).

¹² Barth et al (2009) argue that better information, for instance via credit bureaus, leave less discretion for the loan officer and thus less room for bribery, as it increases the likelihood of exposure. Moreover, it reduces the rent banks can extract (Padilla and Pagano, 1997). Islam (2007) also finds that better information is positively related to higher levels of private credit, raises accountability and reduces corrupt bank lending. Akins et al. (2017) find that timely loan-loss recognition is associated with less lending corruption at the bank level, likely because timely recognition will expose poor credit policies at an earlier stage.

C. Macroeconomic Factors

Many past empirical papers have found that higher inflation is associated with higher interest spreads, but the results have been more mixed in newer studies on high-income countries. Inflation is usually associated with either stronger growth, hence higher credit demand, or monetary instability that contribute to higher risk and uncertainty. Moreover, inflation can erode banks capital, which also necessitates higher margins. On the other hand, inflation deflates clients' debt and can facilitate their debt service. The former effects seem to dominate in earlier studies (e.g., Demirgüç-Kunt and Huizinga, 1999) and in low-income countries (Poghosyan, 2013), typically characterized by periods with higher inflation.

The empirical findings of the impact of real GDP growth on interest margins are even more mixed. A priori, one would expect that the NIM would increase during a boom, as demand for credit rises. However, during the early phase of a boom the risk-adjusted NIM may effectively decrease but the nominal NIM could remain rigid. During a recession, the intermediation cost may not adjust downwards in order to compensate for unexpected provisions and lower credit demand. The net impact will depend on whether quantity outpaces the price effects.

D. Empirical Methodologies

The empirical literature has essentially taken two approaches to examining bank intermediation costs. Ho and Saunders (1981) and Saunders and Schumacher (2000) pursue a two-stage approach when estimating bank interest margins. The initial stage involves isolating the so-called “pure margin” by introducing the variables that are not explicitly captured by the theoretical model. This is followed by a second stage that analyzes the relationship between the pure margin and the variables postulated by the theoretical model. This approach thus separates the effects on the margin for which macroeconomic policy is responsible and components for which the market structure is responsible. However, it requires relatively long timeseries.

The other approach is based on a single-stage methodology. McShane and Sharpe (1985) as well as Angbazo (1997) combine into one equation the variables suggested by the theoretical models with the variables that were not incorporated into modelling the pure margin in the two-stage approach. The main advantage is that this model does not require long timeseries. Applications of this approach include, among others, the work by Maudos and Fernandez de Guevara (2004), Demirgüç-Kunt et al. (2004), and Poghosyan (2013).

III. EXPLAINING BANK INTERMEDIATION COSTS

A. The Data

The dataset we use covers 100 countries spanning the period from 1996 to 2015. It is highly unbalanced across countries and time. During the earlier years, data are not available

for many of the specifications.¹³ The NIM and other aggregated banking industry variables are mainly from Beck et al. (2017) based on Bankscope. The macro data are primarily from *International Financial Statistics*, IMF. The governance indicators are from *Doing Business*, World Bank, the *Worldwide Governance Indicators* based on Kaufmann, Kraay and Mastruzzi (2010), and ethics of private firms from the *Global Competitiveness Index*, World Economic Forum.¹⁴ The countries included in the sample are listed in Appendix I, the data are summarized in Appendix II and the correlation coefficients are tabled in Appendix III.

Financial Intermediation Costs—The Net Interest Margin

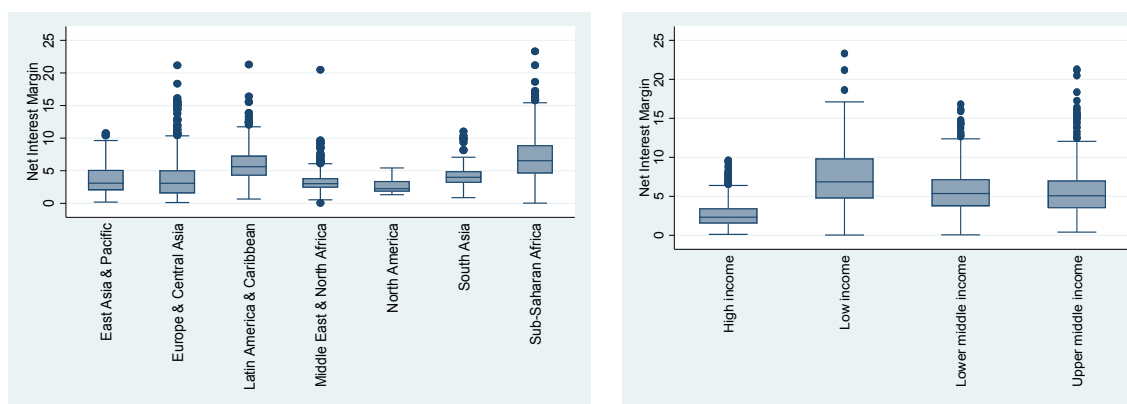
Financial intermediation costs of banks can be measured in different ways that capture various aspects of the governance quality and credit culture. Interest spreads only capture the difference between lending and deposit rates, but not changes in the composition of the balance sheet nor remuneration of required reserves. Return on assets (ROA) does not reflect the operating costs of doing business, but capture compensation for risks, uncertainty and taxation to the extent that ROA before extraordinary items and taxation is used. We, therefore, follow the predominant practice by using the net interest margin (NIM)—i.e., net interest income in percent of interest earning assets—as it captures compensation for costs, risks and uncertainty.

There is a significant variation in bank intermediation costs across countries, regions and income groups. High-income countries in Asia, Europe and North America are characterized by the lowest margins and low-income countries in Sub-Saharan Africa, Latin America and the Caribbean have the highest margins. NIM for high-income countries are on average below 3 percent and do not exceed 10 percent. This is in sharp contrast with low-income countries, which have twice as high NIM, with many of them having NIM exceeding 15 percent (Figure 1).

The NIM of banks across time do not reveal a strong pattern (Figure 2). The average bank intermediation costs do not visibly change over time spanning the period from 1996 to 2015. However, there seems to be a modest downward trend from 2013. Interestingly, the GFC did not bring any significant change in the NIM trend. The policy response to the GFC in many countries involved substantial monetary policy loosening, typically in the form of

¹³ About 55 percent of potential observations are available for the specifications with the broadest coverage.

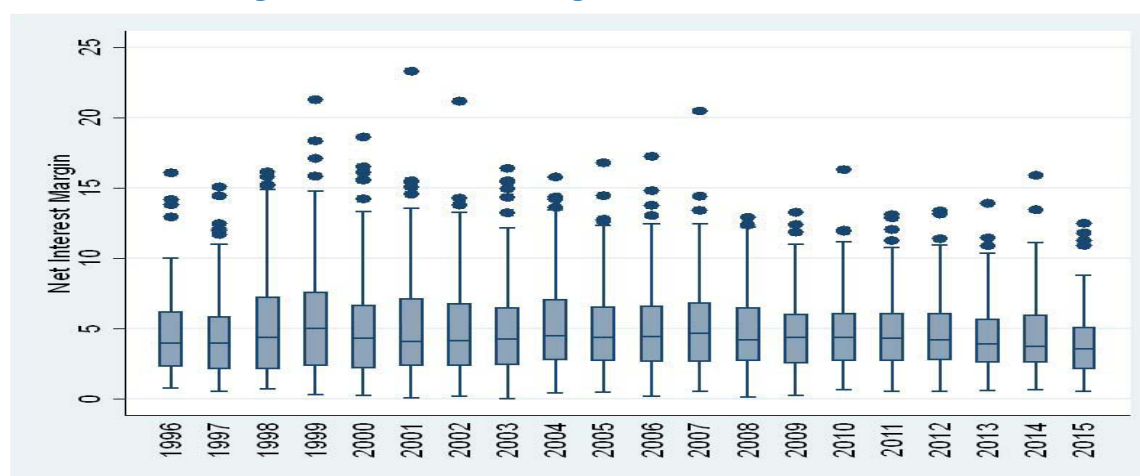
¹⁴ Governance indicators are often criticized for being based on perceptions and small samples. First, perceptions do matter, say when it is decided where to place a greenfield investment. Second, the proxies we use are composites from several sources. Third, so-called objective indicators must also be caveated. For instance, convictions for corruption may increase due to increased corruption or due to an intensified anti-corruption campaign. Note that the 2017 *Special Eurobarometer* on corruption found that on average 68 percent of the respondents in the 28 European Union (EU) countries believed that corruption was “very” or “fairly” widespread,” while only 12 percent knew somebody who had accepted or taken a bribe, and only 5 percent had experienced or witnessed corruption the last 12 months. Finally, despite such unease, it is noteworthy that governance indicators are generally highly correlated. For an overview of various governance indicators, see e.g., the Varieties of Democracy Institute.

Figure 1. Net Interest Margins in Different Country Groups, 1996 – 2015

Source: Beck et al. (2017).

Note: The median is indicated by a line subdividing the interquartile range (the box) with whiskers indicating the lower and upper adjacent values.

lowering interest rates but also nonstandard monetary policy actions that often involved some form of quantitative easing. These actions affected both deposit and lending rates. While the funding costs was limited by the zero lower bound, competition for lending to viable projects may have further driven down lending rates, hence causing some compression of the NIM, especially in European countries from 2013. Nevertheless, net interest income in the Euro Area declined only marginally according to Burke and Garcia (2017) and the NIM remained broadly stable over the financial cycle according to Detragiache et al. (2018).

Figure 2. Net Interest Margins over Time, 1996 – 2015

Source: Beck et al. (2017).

Note: The median is indicated by a line subdividing the interquartile range (the box) with whiskers indicating the lower and upper adjacent values.

B. The Econometric Analysis

The econometric analysis covers four main dimensions. The initial dimension was estimated simply by pooling the data. The pooled OLS estimator was used, and then extended by the inclusion of time effects to capture global business and financial cycles. Second, drawing on the literature applying panel data techniques to examine the role of institutions, we follow Plumber et al. (2005, 2007) as well as Bell and Jones (2015) and employ the random effect model. This allows accounting for dummy variables capturing certain institutional features as well as the fact that governance indicators typically are very slow-moving. We examine the relevance of the random effect by the Breusch-Pagan (1979) test. Third, we address endogeneity by using instrument variable estimations. Fourth, since cross-sectional dependence can be an important feature in macro-panels (Chudik and Pesaran, 2015), we use the Pesaran (2006) test and subsequently proceed with the regressions using standard errors to account for this phenomenon following Driscoll and Kraay (1998).

Our analysis uses a single-stage methodology. Specifically, following the existing literature, we estimate variants of the following equation:

$$NIM_{it} = \alpha_0 + \sum_{k=1}^5 \alpha_{1,k} BSV_{k,it} + \sum_{k=1}^2 \alpha_{2,k} MAC_{k,it} + \sum_{k=1}^M \alpha_{3,k} GOV_{k,it} + \sum_{k=1}^N \alpha_{4,k} OTH_{k,it} + \varepsilon_{it}$$

where NIM denotes banks' NIM in country i at time t , which are explained by banking sector variables (BSV) that comprise measures of competition, operating cost, transaction size, risk aversion, and credit risk; macroeconomic indicators (MAC) like inflation and real economic growth; governance indicators (GOV) that include proxies for the rule of law, regulatory quality, recovery of assets, perceived corruption, ethics of private firms, etc.; and other variables (OTH) that are considered in various extensions.

Basic Specification

A simple regression analysis was conducted, encompassing a basic set of bank characteristics and macroeconomic variables (Table 1). The ambiguity of concentration is confirmed by the data. In the basic specifications we find that our measure for more concentration is significantly correlated with a smaller NIM. In the extended models, the coefficient is also negative, but is only significant in a few of the specifications. In principle, higher concentration should mean more market power, less competition and hence higher NIM. However, there may be returns to scale and efficiency gains. If the latter factor dominates, our measure of larger concentration would imply lower NIM. Given our measure

of competition—share of assets of the three largest banks—the impact of concentration is broadly consistent with theory and results of previous studies.¹⁵

Table 1. Basic Specification

Net interest margin:	(1) OLS	(2) GLS
Competition / concentration	-0.0087 *** (-0.0022)	-0.0080 * (0.0046)
Operating costs	0.3960 *** (0.0702)	0.2610 ** (-0.1050)
Transaction size / financial deepening	-1.6167 *** (0.1560)	-1.3850 *** (0.2320)
Risk-aversion (CAR)	0.0371 ** (0.0112)	0.0274 * (0.0119)
Credit risk (Provisions)	0.0034 *** (0.0009)	0.0027 *** (0.0006)
Inflation (CPI)	3.1134 ** (1.0739)	0.5900 (1.1120)
Number of observations	1187	1187
R squared - overall	0.72	0.71

Sources: IMF staff estimates.

Note: Figures in parentheses indicate standard errors. An *, **, and *** mean significance at, respectively, 10, 5 and 1 percent levels.

The other banking sector variables suggested by the dealership model turn out to be statistically significant. Overhead cost is found to be positively associated with NIM, reflecting that banks tend to pass these costs on to their clients, in line with the results

¹⁵ Staikouras and Wood (2004) find for 685 European banks that banks transforming from small to medium-size typically become more efficient, while transforming from medium to large-size they often become less efficient. Claeyes and Vennet (2008), who also use the share of assets of the three largest banks to measure concentration, find that higher concentration is associated with lower NIM in non-EU accession countries, while the opposite was the case for banks in Western Europe and EU accession countries. Moreover, they note that the foreign bank entry to Central and Eastern Europe both led to bigger concentration and lower margins. Kasman et al. (2011) find that when controlling for direct efficiency measures, the coefficients for market share and concentration became insignificant for European banks during the 1995–2006 period.

obtained by Williams (2007). The transaction size is negatively associated with NIM, pointing to the importance of increasing returns to scale in banking, consistent with previous findings. Risk aversion is positively associated with NIM, reflecting that banks that are better capitalized should in turn have lower funding costs and consequently higher NIM, which is in line with earlier results. Credit risk is positively associated with NIM, confirming that banks charge additional risk premium to compensate for *ex post* credit risk, which is also consistent with previous findings.¹⁶

Like most other more recent studies, the macroeconomic variables, with some exceptions of inflation, are not robustly statistically significant. The impact of real GDP growth¹⁷ and in many cases CPI inflation are not statistically significant, likely due to the counteracting effects discussed in Section II. The exception is the pooled basic model, where inflation is positively associated with higher NIM.

Extended Models

The basic model is extended with various governance indicators to test their relevance on the NIM (Table 2). Like previous studies, we found overwhelming evidence that better governance reduces the NIM. The governance proxies spanned from comprehensive indices on the rule of law to indicators focusing narrowly on the insolvency framework, contract enforcement, and government effectiveness. This can for instance be interpreted that improvements in governance tend to increase the value of collateral for bank loans and consequently reduce the cost of bank intermediation, which is consistent with the evidence by Demirguc-Kunt and Huizinga (1999), Demirguc-Kunt et al. (2004), and Poghosyan (2013).¹⁸ Given that poor governance may lead to higher corruption, we also test for the importance of this variable and find supporting evidence that more corruption tends to increase the NIM, consistent with Poghosyan (2013). With a view to also gauge governance quality in the private sector, we also test ethical behavior of private firms, where higher standards also are associated with lower NIM.¹⁹

Greater international interconnectedness appears to lower the NIM (Table 3). In principle, more openness would limit how much the NIM can increase before clients will

¹⁶ The credit risk proxy only captures *ex post* credit risk, while the proxy for risk aversion is intended to measure buffers to cover unexpected, i.e. *ex ante*, losses stemming from credit, market and operational risks.

¹⁷ Claeyes and Vennet (2008), for instance, find a positive significant relationship for Western Europe, while the correlation is negative, although insignificant, for Central Eastern European banks. Liebeg and Schwaiger (2009) find—based on 895 local Austrian banks between the 1997–2005 period—that the NIM is mainly driven by bank characteristics rather than by macro variables, like changes in GDP and interest rate volatility.

¹⁸ The negative counter effects postulated by Jappelli et al. (2002 and 2005), thus seem muted.

¹⁹ The various governance indicators capture different aspects. For instance, the rule of law covers a broad spectrum, thus overlapping with other indicators, while corruption likely captures the impact of poor governance. Furthermore and related, the governance indicators we use are highly correlated, although they focus on particular aspects. Hence, if all governance indicators are included, we are likely to get multicollinearity.

Table 2. Models Extended with Selected Governance Variables

Net interest margin:	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Competition / concentration	-0.0065 (0.0045)	-0.0080 * (0.0046)	-0.0021 (0.0061)	-0.0026 (0.0061)	-0.0067 (0.0044)	-0.0071 (0.0046)	-0.0100 * (0.0061)
Operating costs	0.2298 *** (0.0883)	0.2341 *** (0.0909)	0.2349 *** (0.0750)	0.2379 *** (0.0781)	0.2302 *** (0.0883)	0.2333 *** (0.0900)	0.1984 ** (0.0643)
Transaction size/ financial deepening	-1.06000 *** (0.2216)	-1.2768 *** (0.2367)	-1.3172 *** (0.2561)	-1.4358 *** (0.2539)	-1.0751 *** (0.2324)	-1.2014 *** (0.2317)	-1.6047 *** (0.2263)
Risk-aversion (CAR)	0.0385 *** (0.0100)	0.0335 *** (0.0168)	0.0379 *** (0.0133)	0.0396 ** (0.0140)	0.0359 ** (0.0100)	0.0388 ** (0.0103)	0.0350 ** (0.0157)
Credit risk (Provisions)	0.0028 *** (0.0006)	0.0028 *** (0.0005)	0.0033 *** (0.0007)	0.0032 *** (0.0007)	0.0031 *** (0.0005)	0.0030 *** (0.0005)	0.0032 *** (0.0005)
Inflation (CPI)	-0.3198 (1.0037)	-0.2793 (1.1333)	0.1606 (1.1000)	0.2229 (1.0807)	-0.4525 (1.0268)	-0.3566 (0.9956)	-0.0088 (1.6579)
Real GDP growth	0.3197 (1.3286)	0.7713 (1.3755)	-0.3301 (2.4053)	-0.2894 (2.3925)	0.5040 (1.3691)	0.4033 (1.3304)	1.4138 (1.3809)
Rule of law	-0.7133 *** (0.1522)						
Regulatory quality		-0.3782 *** (0.1455)					
Insolvency framework			-0.0160 *** (0.0040)				
Contract enforcement				-0.0165 * (0.0090)			
Government effectiveness					-0.6984 *** (0.1518)		
Control for perceived corruption						-0.5069 *** (0.1159)	
Ethics of private firms							-0.2362 * (0.1243)
Number of observations	1102	1102	835	835	1102	1102	748
R squared - overall	0.73	0.71	0.73	0.71	0.72	0.72	0.73

Sources: IMF staff estimates.

Note: The random effects general least squares (GLS) estimator was used. Figures in parentheses indicate standard errors. An *, **, and *** mean significance at, respectively, 10, 5 and 1 percent levels.

Table 3. Extended Models with Interconnectedness

Net interest margin:	(1)	(2)	(3)	(4)
Competition / concentration	-0.0024 (0.0069)	-0.0012 (0.0062)	-0.0026 (0.0069)	-0.0015 (0.0062)
Operating costs	0.2191 *** (0.0687)	0.2191 *** (0.0687)	0.2202 *** (0.0703)	0.2214 *** (0.0705)
Transaction size/ financial deepening	-1.4328 *** (0.3268)	-1.2796 *** (0.2503)	-1.5801 *** (0.3343)	-1.3603 *** (0.2462)
Risk-aversion (CAR)	0.0467 ** (0.0211)	0.0434 *** (0.0152)	0.0501 *** (0.0218)	0.0442 *** (0.0156)
Credit risk (Provisions)	0.0037 *** (0.0005)	0.0032 *** (0.0008)	0.0036 *** (0.0005)	0.0032 *** (0.0008)
Inflation (CPI)	-0.0070 (1.0525)	-0.1074 (1.1217)	-0.0128 (1.0786)	-0.0911 (1.1333)
Real GDP growth	-0.151 (1.5736)	1.5462 (2.5011)	-0.3516 (1.5640)	-1.6641 (2.4798)
Insolvency framework	-0.0144 *** (0.0040)	-0.0142 *** (0.0041)		
Contract enforcement			-0.0178 * (0.0096)	-0.0166 * (0.0084)
International debt	-0.0050 (0.0031)		-0.0057 * (0.0029)	
Cross-border bank loans		-0.0072 ** (0.0029)		-0.0083 *** (0.0026)
Number of observations	632	793	632	793
R squared - overall	0.73	0.73	0.73	0.74

Sources: IMF staff estimates.

Note: The random effects general least squares (GLS) estimator was used. Figures in parentheses indicate standard errors. An *, **, and *** mean significance at, respectively, 10, 5 and 1 percent levels.

solicit funding from abroad. Higher levels of both international debt and cross-border bank loans, which are used to indicate greater international interconnectedness, tend to reduce the NIM, while controlling for financial deepening and macroeconomic variables.²⁰ Countries with more financial deepening are likely also to be more interconnected.

Deeper private capital markets do not appear to significantly reduce the NIM (Table 4).

We used stock market capitalization, traded stocks in percent of GDP and private bond issuances as proxies for capital market development. As previously mentioned, well-developed capital markets depend on a solid legal system with good governance practices. These conditions are also advantageous for banking and may thus outweigh much of the competition from the capital market.²¹

The Global Financial Crisis

The potential impact of the GFC on the NIM is explored (Table 5). This extension is meant to examine: (i) if there was any significant change in the NIM before and after the GFC; and (ii) whether the relationship between explanatory variables and the NIM changed with the GFC. A GFC dummy (1 in 2007 and afterwards) is thus included in the regressions. There is only very limited evidence that the GFC tended to reduce the NIM, with the GFC dummy being significant in less than half the specifications.

The interaction terms suggest that the GFC affected the NIM mainly via credit risk.

Interactive variables are constructed by multiplying the GFC dummy by the respective explanatory variable. This is to assess whether the GFC worked indirectly via the other variables. The results generally indicate no statistically significant role of these interaction terms, with the notable exception of credit risk, which is overpowered by the interaction term. It seems that credit risk is much more strongly associated with the NIM after the GFC. This is in line with the findings by Apergis and Cooray (2018).²² They argue that credit risk has become more appropriately reflected after the GFC, which suggests that it was underpriced prior to the GFC. After the crisis, more costly screening, monitoring, and higher capital requirements have been introduced (Mishkin and Eakins, 2012). The pertinent interaction terms, however, are not significant.

²⁰ Poghosyan (2013) looks at domestic bank competition and finds a positive association with fraction of bank entries denied and higher margins for low-income and emerging market economies.

²¹ The perfect substitutability between debt and equity finance proposed by the Modigliani-Miller theorem may become complementary due to monitoring costs, etc. as argued by Boyd and Smith (1996). Obviously, the Modigliani-Miller and the other *irrelevance theorems* only work in a neoclassical phantom world with a complete set of state-contingent Arrow-Debreu markets, nicely behaved utility and production functions, etc. As soon as these assumptions become more realistic, asymmetric information, transaction and agency costs emerge and the quality of governance (Williamson, 2005) become relevant, while the irrelevance theorems become irrelevant.

²² They focused on interest spreads of OECD countries during the 1990–2015 period.

Table 4. Extended Models with Capital Market Variables

Net interest margin:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Competition / concentration	-0.0039 (0.0046)	0.0017 (0.0065)	-0.0038 (0.0046)	-0.0087 ** (0.0040)	-0.0036 (0.0046)	0.0017 (0.0064)	-0.0037 (0.0045)	-0.0088 ** (0.0039)
Operating costs	0.3669 *** (0.1379)	0.3409** (0.1567)	0.3690 * (0.1398)	0.5764 *** (0.1148)	0.3701 *** (0.1379)	0.3451** (0.1575)	0.3745 * (0.1405)	0.5841 *** (0.1144)
Transaction size/ financial deepening	-1.1513 *** (0.2737)	-1.2261*** (0.3141)	-1.1794 *** (0.2717)	-0.5117 (0.3164)	-1.1432 *** (0.2592)	-1.2714*** (0.3133)	-1.2070 *** (0.2615)	-0.5198 * (0.2989)
Risk-aversion (CAR)	0.0316 (0.0210)	0.0382 * (0.0189)	0.0308 (0.0212)	0.0427 ** (0.0208)	0.03066 (0.0212)	0.03832 * (0.0201)	0.030 (0.0213)	0.0427 ** (0.0203)
Credit risk (Provisions)	0.0028 *** (0.0005)	0.0027 *** (0.0006)	0.0027 *** (0.0006)	0.0017 * (0.0010)	0.0028 *** (0.0005)	0.0026 *** (0.0006)	0.0026 *** (0.0006)	0.0019 * (0.0011)
Inflation (CPI)	-3.6945** (1.5926)	5.1973 ** (1.6424)	4.3763 * (1.5837)	1.6618 (2.0506)	-3.7008** (1.6733)	5.2458 ** (1.7178)	4.4011 * (1.6378)	1.7381 (1.9950)
Real GDP growth	-0.6081 (1.8524)	0.2558 (1.4802)	-0.4222 (1.7681)	-0.4826 (1.6532)	-0.563 (1.8181)	0.1182 (1.4578)	-0.4859 (1.7420)	-0.5873 (1.5911)
Insolvency framework	-0.0078 (0.0049)	-0.0082 * (0.0044)	-0.0088 * (0.0051)	-0.0061 (0.0048)				
Contract enforcement					-0.0208 ** (0.0087)	-0.0143 * (0.0084)	-0.0194 * (0.0083)	-0.0151 * (0.0078)
Stock market capitalization	-0.0021 (0.0022)				-0.0029 (0.0022)			
Stock market traded value		-0.0085 (0.0016)				-0.0013 (0.0017)		
Stock market turnover			-0.0002 (0.0004)				-0.0002 (0.0004)	
Private bond issuance				-0.0042 (0.0039)				-0.004 (0.0037)
Number of observations	588	604	573	318	588	604	573	318
R squared - overall	0.79	0.79	0.79	0.74	0.80	0.80	0.80	0.76

Sources: IMF staff estimates.

Note: The random effects general least squares (GLS) estimator was used. Figures in parentheses indicate standard errors. An *, **, and *** mean significance at, respectively, 10, 5 and 1 percent levels.

Table 5. Extended Models with Impact of Global Financial Crisis

Net interest margin:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Competition / concentration	0.0058 (0.0112)	-0.0021 (0.0062)	-0.0023 (0.0060)	-0.0021 (0.0061)	-0.0026 (0.0063)	-0.0019 (0.0063)	-0.0021 (0.0062)	0.0049 (0.0111)	-0.0023 (0.0062)	-0.0026 (0.0060)	-0.0023 (0.0062)	-0.0028 (0.0063)	-0.0022 (0.0063)	-0.0023 (0.0062)
Operating costs	0.2363 *** (0.0750)	0.2198** (0.0887)	0.2339 *** (0.0750)	0.2345 *** (0.0749)	0.2318 *** (0.0758)	0.2367** (0.0764)	0.2345 *** (0.0748)	0.2383 *** (0.0775)	0.2245 ** (0.0905)	0.2370 *** (0.0778)	0.2370 *** (0.0775)	0.2346 *** (0.0782)	0.2387 *** (0.0788)	0.2386 *** (0.0775)
Transaction size/ financial deepening	-1.3100 *** (0.2560)	-1.3222*** (0.2572)	-1.4195 *** (0.3625)	-1.3158 *** (0.2561)	-1.2942 *** (0.2522)	-1.3068*** (0.2549)	-1.3165 *** (0.2562)	-1.4503 *** (0.2474)	-1.4548*** (0.2477)	-1.5589 *** (0.3492)	-1.4463 *** (0.2457)	-1.4306 *** (0.2452)	-1.4458 *** (0.2449)	-1.4159 *** (0.2520)
Risk-aversion (CAR)	0.0404 *** (0.0139)	0.0389 *** (0.0134)	0.0359 *** (0.0140)	0.0386 ** (0.0179)	0.0390 *** (0.0133)	0.0393 *** (0.0136)	0.0374 *** (0.0136)	0.0392 *** (0.0147)	0.0379 *** (0.0142)	0.0349 ** (0.0149)	0.0408 ** (0.0193)	0.0381 *** (0.0142)	0.0380 *** (0.0144)	0.0302 *** (0.0142)
Credit risk (Provisions)	0.0033 *** (0.0008)	0.0033 *** (0.0008)	0.0034 *** (0.0006)	0.0033 *** (0.0007)	-0.0005 (0.0019)	0.0033 *** (0.0008)	0.0033 *** (0.0007)	0.0032 *** (0.0008)	0.0033 *** (0.0007)	0.0034 *** (0.0006)	0.0033 *** (0.0007)	-0.0004 (0.0020)	0.0033 *** (0.0007)	0.0032 *** (0.0007)
Inflation (CPI)	0.1930 (1.0866)	0.2001 (1.0947)	0.1558 (1.1132)	0.1567 (1.0972)	0.1934 (1.0836)	-1.2895 (2.3187)	0.1524 (1.1049)	0.2187 (1.1051)	0.2210 (1.1224)	0.2011 (1.1317)	0.1929 (1.1196)	0.2235 (1.1029)	-0.8899 (2.3814)	0.2190 (1.1171)
Real GDP growth	-0.3179 (2.3405)	-0.3836 (2.3336)	-0.3168 (2.3765)	-0.3373 (2.4259)	-0.5695 (2.4365)	-0.2954 (2.3565)	-0.3309 (2.3974)	-0.4549 (2.3439)	-0.5099 (2.3280)	-0.4383 (2.3669)	-0.4754 (2.4189)	-0.696 (2.4334)	-0.4345 (2.3570)	-0.4522 (2.3963)
Insolvency framework	-0.0165 *** (0.0041)	-0.0161 *** (0.0040)	-0.0159 *** (0.0040)	-0.0061 *** (0.0040)	-0.0165 ** (0.0040)	-0.0162 *** (0.0040)	-0.0164 *** (0.0049)							
Contract enforcement								-0.0155 * (0.0085)	-0.0157 * (0.0086)	-0.0158 * (0.0084)	-0.0157 * (0.0086)	-0.0166 * (0.0085)	-0.0155 * (0.0086)	-0.0153 * (0.0085)
GFC dummy	0.3397 (0.7681)	-0.4544 * (0.2634)	-0.9057 (1.3250)	-0.3486 (0.3851)	-0.7393 ** (0.2893)	-0.4567 * (0.2613)	-0.03932 (0.3501)	0.1419 (0.7666)	-0.5354 * (0.2704)	-1.0143 (1.3365)	-0.3689 (0.3884)	-0.8293 * (0.3023)	-0.5289 ** (0.2696)	-0.2730 (0.3492)
GFC dummy / comp. or concentration	-0.0105 (0.0114)							-0.0090 (0.0113)						
GFC dummy / operating costs		0.0218 (0.0604)							0.0179 (0.0634)					
GFC dummy / transaction size or fin. deepening			0.1352 (0.2979)							0.1389 (0.2984)				
GFC dummy / risk aversion (CAR)				-0.0012 (0.0212)							-0.0058 (0.0224)			
GFC dummy / credit risk (Provisioning)					0.0045 ** (0.0019)							0.0043 ** (0.0019)		
GFC dummy / inflation						1.8992 (2.4054)							1.4196 (2.4877)	
GFC dummy / insolvency framework							0.0006 (0.0043)							-0.0040 (0.0037)
Number of observations	835	835	835	835	835	835	835	835	835	835	835	835	835	835
R squared - overall	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73

Sources: IMF staff estimates.

Note: The random effects general least squares (GLS) estimator was used. Figures in parentheses indicate standard errors. An *, **, and *** mean significance at, respectively, 10, 5 and 1 percent levels.

C. Robustness Checks

Additional governance indicators showed similar results (Table 10). These indicators included property right protection, judicial independence and impartiality of courts. Although the coverage of these indicators is not as good as the ones employed in the main specifications, they generally show similar results, pointing to the importance of governance in setting net interest margins by banks.²³

Instrument variables were used to account for endogeneity (Table 11). Given the fact that governance indicators may potentially be endogenous, we draw on the political economy literature and employ as instruments voice and accountability as well as political stability indicators. They are considered to shape political power and institutions, which in turn shape economic institutions. The latter typically is captured by the rule of law, regulatory and insolvency framework and contract enforcement, as discussed by, among others, Acemoğlu (2005) and Acemoğlu and Robinson (2016).²⁴ We also include lagged explanatory variables as instruments.

Adjustments are made for cross-sectional dependence (Table 12), which can be an important issue in macro-panels (Chudik and Pesaran, 2015). To test for the presence of cross-sectional dependence, we follow Pesaran (2006) and subsequently proceed with the regressions using standard errors accounting for this phenomenon following Driscoll and Kraay (1998).

A probit model is used to account for possible non-linearity in the relationship between net interest margins and candidate explanatory variables (Table 13). Certain mechanisms may start operating only at higher level of margins. A probit model is thus applied with the cut-off point for the dependent variable set at the 75th percentile of the distribution. The results did not change significantly compared to the basic regressions.

²³ Alternative dependent variables, like interest rate spreads and ROA before taxation were also tried, but the explanatory power of the panel regressions is much weaker. Taxation could be an important missing explanatory variable. This is most likely to be the case for ROA, where taxation can be assumed to constitute a relatively larger share. Quantifying the impact of taxation is challenging due to lack of comparable data. The *total tax rate on commercial profits* reported by the Doing Business Reports was used as a rough proxy. However, some countries have special bank taxes, different rules for tax deductibility of provisions and deferment of losses, etc. that are not captured by this proxy. Moreover, the number of observations is limited. Furthermore, this rate is over 100 percent in some countries—typically countries in the lower end of the distribution of various governance indicators. All these factors may help explain the inconclusive results.

²⁴ Admittedly, some bank characteristics and governance proxies are potentially correlated, like credit risk and the effectiveness of debt recovery. However, neither the variance inflation factor approach available in STATA nor correlation coefficients of the potentially correlated candidates indicated issues with multicollinearity (Appendix III).

Panel estimations with lagged dependent variable using standard techniques can be challenging (Table 14). Judson and Owen (1999) have shown that the standard estimator performs better than other methods, such as the generalized method of moments estimator, when N is moderately large and T is relatively small, as in this paper. The results with the lagged dependent variable tend to reduce the coefficients somewhat, but do not materially change the across the various specifications.²⁵

Finally, the sensitivity to outliers is investigated (Table 15). Following Blanchard and Leigh (2013), we re-estimate the specifications using robust regressions, which down-weights observations with larger absolute residuals using iterative weighted least squares (Andersen, 2008). This methodology results in broadly similar results across the various specifications.²⁶

IV. POLICY SIMULATIONS: THE COST OF POOR GOVERNANCE

The above empirical findings offer an opportunity to gauge the financial intermediation costs caused by poor governance. The NIM of the seven models shown in Table 2 are estimated to the extent data are available.²⁷ The simple *average fitted* NIM of these models is calculated using the actual values for each year. Then the average fitted NIM is calculated assuming that the respective governance variable instead is at the top 10 percent threshold. The difference between these two estimations, all other things equal, shows how much lower the NIM could have been due to improved governance. The NIM differences are then multiplied on bank credit to the private sector in percent of GDP to evaluate the potential *annual* gains, or savings, in percent of GDP. In other words, the same level of intermediation could have been achieved with this amount of fewer resources, had the governance been at the top 10 percent level.

²⁵ This is extended by calculating bias-corrected least squares dummy variable (LSDV) estimators for the standard autoregressive panel data model using the bias approximations in Bruno (2005), who extends the results by Bun and Kiviet (2003), Kiviet (1999) and Kiviet (1995) to unbalanced panels. The results are obtained through bootstrapping variance-covariance matrix for LSDV estimators.

²⁶ Additional robustness checks were performed. First, to examine if changes in governance are associated with changes in financial intermediation costs, we estimated specifications with some governance indicators in differences. The results confirm that better governance is typically associated with lower financial intermediation costs. Second, to examine if market structure is part of the underlying mechanism where governance shapes market structure, we estimated specifications excluding concentration and including some governance indicators. The results confirm that better governance is typically associated with lower financial intermediation costs. Third, to examine the robustness of results across subsamples, we followed Acemoglu et al. (2001) and Demirguc-Kunt et al. (2004) and estimated specifications accounting for income groups. The results are available from the authors upon request.

²⁷ Ideally, the different models should be estimated for each income group. Due to data availability, this was only possible for high-income countries, which reduced the annual savings for high-income countries.

Policy simulations suggest that the potential gains from better governance can be sizeable (Table 6). Low-income countries have more room to improve their governance and could thus reduce their NIM by on average about 1 percentage point and high-income countries on average by about 0.3 percentage point. (High-income countries at or above the top 10 percent governance threshold were not included.) The gains in percent of GDP are almost inverse, due to the greater financial deepening in higher income countries. The *annual* savings may be sizable accumulated over time. This could explain why it seems to be easier to find positive association between governance and financial deepening than with financial intermediation costs. Furthermore, the estimated annual gains may not fully capture other beneficial side-effects, like lengthening of maturities, less required collateral due to better governance, etc.²⁸

Table 6. Estimated Potential Savings from Improved Governance

	Estimated annual savings 1/ (Percent of GDP)	Lower net interest margin 2/ (Percentage points)	Number of countries 3/
Whole sample:	0.28	0.69	95
High income countries 4/	0.23	0.34	35
Upper middle inc. countries	0.35	0.83	28
Lower middle inc. countries	0.31	1.00	24
Low income countries	0.12	1.04	8

Source: Authors' calculations.

Note: Calculated as the simple average of annual estimated savings, whenever data are available; i.e. for some countries only one or a few years were included. The savings are calculated as the difference between the fit of the actual values and the fit if the pertinent governance variable had been at the top 10 percent threshold. The simple average of up to seven models shown in Table 2 were used to the extent data were available, i.e. some of the annual observations reflect the average of fewer than the seven models.

1/ Simple averages of annual savings, i.e., the lower net interest margin due to the assumed higher governance quality was applied on bank credit to the private sector in percent of GDP. For some countries (Belgium, France, Ireland, Portugal and Spain) at least one observation could not be included due to lack of data on bank credit, but they were still included in the calculated of the net interest margin (second column in this Table).

2/ Simple average of lower net interest margins if the pertinent governance variable - at a minimum in one of the seven models in Table 2 - was increased to the top 10 percent threshold.

3/ Number of countries where data were available for at a minimum one year in - at a minimum one of the seven models in Table 2 - during the 1996-2015 period.

4/ Some high-income country observations were not included in the calculation of savings. Mainly because their governance indicators were already at the top 10 percent or because the use of the average of the seven models resulted in negative savings in some years. The following countries were not included: Denmark, Finland, Netherlands, Norway, and Singapore. The following countries had one or more of the annual calculations excluded: Australia, Austria, Canada, France Germany, Sweden, Switzerland, and the United Kingdom.

²⁸ Bae and Goyal (2009) reconfirmed that poor property rights and poor enforcement of these rights typically require more collateral, shorter maturities, and larger interest spreads. They used a sample of 63,158 loans of about 22,000 borrowers and banks in 48 countries during the period 1994–2003. They also found that lenders reduced maturities and increased lending spreads during the Asian Economic Crisis 1997–1998.

Improving the more general governance indicators to the specified threshold typically seem to have the biggest impact. Enhancing the rule of law, boosting the effectiveness of government and reducing corruption appear to have the largest impact on the NIM. Interestingly, improving the ethics of private firms seem to have an even bigger impact, likely because it points to a better credit culture. The number of observations, however, is much smaller for ethics of private firms. Obviously, priority should be given to eliminate the most harmful practices. Nevertheless, the consequences for the whole economy must be considered before introducing specific measures primarily focused on lowering financial intermediation costs. Moreover, low-hanging fruits should be given priority, i.e. prioritize the path of least resistance. The visible benefits of such an approach could pave the way for additional reforms. Finally, although new technology poses its own governance challenges, it also offers new opportunities that enable lower income countries to leapfrog, as monitoring and information gathering become much more affordable.

These results are only illustrative and must be interpreted with caution. Most of the governance indicators were not available in the earlier part of the analyzed period and for some countries only a few years were included. Some bank characteristics may not be entirely independent of the governance indicators. While improving the governance quality to the top 10 percent level may seem exceptionally ambitious, there could be improvements in several governance indicators at the same time. Moreover, there could be other positive externalities, including on sustainable real growth. In short, the simulations lend credence to the intuition that better perceived governance practices should reduce costs, risks and uncertainty.

V. CONCLUSION

Our empirical analysis provides evidence that good governance practices are associated with lower financial intermediation costs. If governance practices were to improve to the top 10 percent threshold, the NIM of low-income countries would decline on average by about 1 percentage point and high-income countries by about 0.3 percentage point, as the latter's governance practices already are better. The "gains" in percent of GDP, however, are almost inverse, due to the greater financial deepening in higher income countries. In many countries, it could amount to about $\frac{1}{3}$ percent of GDP per year. Accumulated over time, such savings could become sizable.

The paper reconfirms that various bank characteristics significantly influence bank intermediation costs. Countries with higher operating costs, risk aversion as well as credit risk tend to have higher margins, while those with higher transaction size have lower margins, hinting at increasing returns to scale.

The impact of the GFC on the NIM appears to have worked mainly through credit risk. Credit risk is more strongly associated with the NIM after the GFC compared to the period prior to the crisis. This may stem from the fact that some of the lending prior to the GFC proved to be too lax and unsustainable.²⁹

Further research is needed to fully explore why improvements in governance are not pursued more proactively to realize the substantial gains. This is likely to be a typical collective action problem, in which the benefits are diffuse and widespread, hence difficult to internalize. At the same time, those benefitting from poor governance are often well-organized, influential and are able to habitually pass the costs on to their clients and tax payers.

²⁹ As Irving Fisher (1933, page 341) noted: “...*over-confidence seldom does any great harm except when, as, and if, it beguiles its victims into debt.*”

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Appendix I. Countries Included in the Sample

Table 7. Countries Included in the Sample			
High income countries	Upper middle income countries	Lower middle income countries	Low income countries
Australia	Algeria	Armenia	Afghanistan
Austria	Argentina	Bangladesh	Burundi
Belgium	Belarus	Bhutan	Cambodia
Canada	Bosnia and Herzegovina	Cameroon	Guinea
Chile	Botswana	El Salvador	Madagascar
Croatia	Brazil	Gabon	Rwanda
Cyprus	Bulgaria	Guatemala	Tanzania
Czech Republic	China	Honduras	Uganda
Denmark	Colombia	India	
Estonia	Costa Rica	Indonesia	
Finland	Dominican Republic	Kenya	
France	Ecuador	Kosovo	
Germany	Georgia	Lesotho	
Greece	Ghana	Moldova	
Hungary	Kazakhstan	Nigeria	
Ireland	Lebanon	Pakistan	
Israel	Macedonia, FYR	Philippines	
Italy	Malaysia	Sri Lanka	
Japan	Mauritius	Swaziland	
Latvia	Mexico	Tajikistan	
Lithuania	Namibia	Ukraine	
Luxembourg	Panama	Vietnam	
Malta	Paraguay	West Bank and Gaza	
Netherlands	Peru	Zambia	
Norway	Romania		
Poland	South Africa		
Portugal	Thailand		
Saudi Arabia	Turkey		
Seychelles			
Singapore			
Slovak Republic			
Slovenia			
Spain			
Sweden			
Switzerland			
Trinidad and Tobago			
United Arab Emirates			
United Kingdom			
United States			
Uruguay			
Number of countries:			
40	28	24	8
Note: The panel is unbalanced across time. Other countries were not included primarily due to data limitations.			

Appendix II. Data Description and Sources

Table 8. Data Description and Sources

Table 8. Data Description and Sources							
Variable	Countries in the Sample 1996 - 2015					Comment	Source(s)
	Obs	Mean	Std. Dev.	Min	Max		
Financial intermediation costs							
Net interest margin (NIM)	1,897	4.7	3.1	0.1	21.2	"Accounting value of bank's net interest revenue as a share of its interest-bearing (total earning) assets."	Beck et al. (2017)
Interest spread	1,448	8.1	10.1	-6.9	216.4	Difference between lending rates and deposit rates. Negative spread from countries with interest controls and highest rate from countries with hyper inflation.	International Financial Statistics, IMF
Return on Assets (ROA)	1,901	1.2	1.6	-9.9	9.3	"Average Return on Assets (net Income/total assets)."	Beck et al. (2017)
Return on Assets (ROA_FSI)	1,425	1.2	2.0	-25.6	9.8	Return on Assets (net Income before extraordinary income and taxes/total assets). This variable is used in the regressions.	Financial Soundness Indicators Database and Global Financial Stability Report (GFSR), IMF
Bank characteristics							
Competition/concentration	1,827	66.4	19.4	17.3	100.0	"Assets of three largest banks as a share of assets of all commercial banks."	Beck et al. (2017)
Operating costs	1,908	3.9	3.2	0.04	57.8	"Accounting value of a bank's overhead costs as a share of its total assets."	Beck et al. (2017)
Transaction size/ fin. Deep.	1,959	3.8	0.9	-0.1	5.6	Log to "claims on domestic real nonfinancial sector by deposit money banks as a share of GDP, calculated using the following deflation method: $\{(0.5)*[F_t/P_{et} + F_{t-1}/P_{et-1}]\}/[GDP_t/P_{at}]$ where F is deposit money bank claims, P_e is end-of period CPI, and P_a is average annual CPI."	Beck et al. (2017)
Risk-aversion (CAR)	1,421	15.8	4.8	-18.2	41.3	Regulatory capital to risk-weighted assets. Definition may differ across countries.	Financial Soundness Indicators Database and Global Financial Stability Report (GFSR), IMF
Credit risk (Provisions)	1,234	76.9	46.1	9.9	806.8	Provision ratio, share of NPLs provisioned. The ratio can be above 100, in particular if general provisions are very high.	Financial Soundness Indicators Database and GFSR, IMF
Non-performing loans (NPL)	1,439	6.9	7.6	0.02	74.1	NPLs in percent of gross loans. Definitions may vary across countries and over time.	Financial Soundness Indicators Database and GFSR, IMF
Business cycle							
Real GDP growth	1,988	0.04	0.04	-0.15	0.62	Change of real GDP ($rgdpg = rgdp/rgdp[_{n-1}-1]$). Multiply by 100 to get it in percentage change.	International Financial Statistics, IMF
Inflation (CPI)	1,984	0.1	0.3	-0.1	10.6	Change of CPI ($infl = infl/infl[_{n-1}-1]$). Multiply by 100 to get it in percentage change.	International Financial Statistics, IMF
Output gap							World Economic Outlook, IMF
Policy rate							International Financial Statistics, IMF
Real interest rate						Policy rate or T-bill rate deflated by CPI.	International Financial Statistics, IMF
Governance indicators							
Rule of law	1,696	0.2	1.0	-2.0	2.1	"... captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence." It is a composite index relying on various sources.	Worldwide Governance Indicators http://info.worldbank.org/governance/wgi/
Property right protection							
Regulatory quality	1,692	0.3	0.9	-2.2	2.3	"... captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development." It is a composite index relying on various sources.	Worldwide Governance Indicators http://info.worldbank.org/governance/wgi/

Table 8 continued: Data Description and Sources

Variable	Countries in the Sample 1996 - 2015					Comment	Source(s)
	Obs	Mean	Std. Dev.	Min	Max		
Insolvency framework	1,065	42.8	26.6	0.0	100.0	Time, cost and outcome of recovery of debt. Distance to frontier.	Doing Business, World Bank
Contract enforcement	1,065	68.2	15.6	0.0	100.0	Enforcing contracts, distance to frontier, measuring time and cost of resolving a dispute at first-instance court.	Doing Business, World Bank
Contract enforcement	1,065	60.5	13.0	20.8	93.4	Enforcing contracts, distance to frontier	Doing Business, World Bank
Government effectiveness	1,693	0.3	1.0	-2.3	2.4	"... captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies." It is a composite index relying on various sources.	Worldwide Governance Indicators http://info.worldbank.org/governance/wgi/
Control of corruption	1,696	0.2	1.0	-1.9	2.6	"... captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests." It is a composite index relying on various sources.	Worldwide Governance Indicators http://info.worldbank.org/governance/wgi/
Ethics of private firms	913	4.3	1.0	2.6	6.8	Ethical behavior of private firms.	Global Competitiveness Index, World Economic Forum
Other variables							
International debt	1,364	25.4	32.7	0.04	247.0	"International Debt Securities (Amt Outstanding) as a share of GDP."	Beck et al. (2017)
Cross-border bank loans	1,922	19.6	28.4	0.03	248.6	"International Debt Securities (Net Issues) as a share of GDP."	Beck et al. (2017)
Stock market capitalization	1,438	48.8	56.9	0.01	857.6	"Value of listed shares to GDP, calculated using the following deflation method: $\{(0.5) * [F_t/P_{et} + F_{t-1}/P_{et-1}]\} / [GDP_t/P_{at}]$ where F is stock market capitalization, P _e is end-of period CPI, and P _a is average annual CPI."	Beck et al. (2017)
Stock traded value	1,476	26.8	43.9	0.0004	331.3	"Total shares traded on the stock market exchange to GDP."	Beck et al. (2017)
Stock market turnover	1,431	49.7	83.6	0.01	1,732.3	"Ratio of the value of total shares traded to average real market capitalization, the denominator is deflated using the following method: $T_t/P_{at} / \{(0.5) * [M_t/P_{et} + M_{t-1}/P_{et-1}]\}$ where T is total value traded, M is stock market capitalization, P _e is end-of period CPI, P _a is average annual CPI."	Beck et al. (2017)
Private bond issuance	740	27.4	30.8	0.002	197.1	"Private domestic debt securities issued by financial institutions and corporations as a share of GDP, calculated using the following deflation method: $\{(0.5) * [F_t/P_{et} + F_{t-1}/P_{et-1}]\} / [GDP_t/P_{at}]$ where F is amount outstanding of private domestic debt securities, P _e is end-of period CPI, and P _a is average annual CPI."	Beck et al. (2017)
Private sector bank credit	1,946	51.2	42.9	0.19	253.5	"Private credit by deposit money banks and other financial institutions to GDP, calculated using the following deflation method: $\{(0.5) * [F_t/P_{et} + F_{t-1}/P_{et-1}]\} / [GDP_t/P_{at}]$ where F is credit to the private sector, P _e is end-of period CPI, and P _a is average annual CPI."	Beck et al. (2017)
Proxy for corporate income tax	1,006	42.3	25.0	0.4	280.2	Total tax rate on commercial profits.	Doing Business, World Bank

Appendix III. Correlation Coefficients

Table 9. Correlation Coefficients of Main Variables

	Net interest margin (NIM)	Interest spread	Return on Assets (ROA)	Return on Assets (ROA_FSI)	Competition/concentration	Operating costs	Transaction size/ fin. Deep.	Risk-aversion (CAR)	Credit risk (Provisions)	Non-performing loans (NPL)	Real GDP growth	Inflation (CPI)	Rule of law	Regulatory quality
Net interest margin (NIM)	1.00													
Interest spread	0.65	1.00												
Return on Assets (ROA)	0.64	0.45	1.00											
Return on Assets (ROA_FSI)	0.61	0.39	0.84	1.00										
Competition/concentration	-0.41	0.09	-0.26	-0.21	1.00									
Operating costs	0.74	0.35	0.36	0.42	-0.39	1.00								
Transaction size/ fin. Deep.	-0.80	-0.50	-0.58	-0.57	0.35	-0.77	1.00							
Risk-aversion (CAR)	0.14	0.04	-0.01	0.17	-0.19	0.19	-0.11	1.00						
Credit risk (Provisions)	0.53	0.37	0.43	0.48	-0.18	0.43	-0.47	-0.10	1.00					
Non-performing loans (NPL)	0.20	0.08	-0.34	-0.32	-0.23	0.24	-0.14	0.30	-0.20	1.00				
Real GDP growth	0.18	0.11	0.33	0.33	-0.03	0.12	-0.30	-0.01	0.25	-0.20	1.00			
Inflation (CPI)	0.33	0.05	0.32	0.35	-0.34	0.41	-0.47	-0.01	0.24	0.02	0.14	1.00		
Rule of law	-0.73	-0.45	-0.48	-0.55	0.53	-0.59	0.68	-0.35	-0.37	-0.28	-0.22	-0.41	1.00	
Regulatory quality	-0.56	-0.25	-0.39	-0.48	0.53	-0.52	0.59	-0.40	-0.32	-0.24	-0.18	-0.47	0.93	1.00
Insolvency framework	-0.39	-0.26	-0.17	-0.15	0.41	-0.41	0.47	-0.24	-0.10	-0.34	-0.04	-0.27	0.58	0.57
Government effectiveness	-0.50	-0.25	-0.41	-0.53	0.05	-0.26	0.37	-0.19	-0.21	0.18	-0.21	-0.13	0.33	0.20
Contract enforcement	-0.79	-0.47	-0.48	-0.53	0.59	-0.67	0.72	-0.27	-0.35	-0.30	-0.14	-0.42	0.96	0.88
Control of corruption	-0.67	-0.32	-0.38	-0.44	0.56	-0.53	0.61	-0.34	-0.24	-0.39	-0.13	-0.38	0.96	0.90
Ethics of private firms	-0.66	-0.32	-0.32	-0.35	0.63	-0.59	0.65	-0.25	-0.24	-0.47	-0.03	-0.37	0.85	0.77
International debt	-0.55	-0.30	-0.43	-0.42	0.40	-0.31	0.48	-0.14	-0.19	-0.20	-0.21	-0.24	0.53	0.47
Cross-border bank loans	-0.55	-0.30	-0.42	-0.41	0.39	-0.31	0.48	-0.14	-0.19	-0.21	-0.21	-0.23	0.52	0.47
Stock market capitalization	-0.51	-0.23	-0.22	-0.15	0.56	-0.44	0.56	0.08	-0.22	-0.36	0.07	-0.26	0.49	0.44
Stock traded value	-0.61	-0.28	-0.38	-0.34	0.49	-0.50	0.66	-0.09	-0.12	-0.38	-0.05	-0.31	0.57	0.49
Stock market turnover	-0.33	-0.24	-0.24	-0.31	0.09	-0.31	0.45	-0.23	0.05	-0.14	-0.05	-0.22	0.26	0.17
Private bond issuance	-0.40	-0.26	-0.19	-0.25	0.18	-0.57	0.57	-0.26	-0.20	-0.18	-0.04	-0.27	0.41	0.34
Private sector bank credit	-0.76	-0.41	-0.49	-0.46	0.45	-0.71	0.92	-0.13	-0.34	-0.33	-0.21	-0.49	0.70	0.59

Table 9 (continued): Correlation Coefficients of Main Variables

	Insolvency framework	Contract enforcement	Government effectiveness	Control of corruption	Ethics of private firms	International debt	Cross-border bank loans	Stock market capitalization	Stock traded value	Stock market turnover	Private bond issuance	Private sector bank credit
Insolvency framework	1.00											
Contract enforcement	0.13	1.00										
Government effectiveness	0.60	0.35	1.00									
Control of corruption	0.62	0.29	0.94	1.00								
Ethics of private firms	0.62	0.15	0.89	0.91	1.00							
International debt	0.32	0.19	0.51	0.57	0.52	1.00						
Cross-border bank loans	0.32	0.19	0.51	0.57	0.52	1.00	1.00					
Stock market capitalization	0.31	0.02	0.58	0.55	0.70	0.37	0.37	1.00				
Stock traded value	0.50	0.24	0.66	0.63	0.72	0.49	0.49	0.69	1.00			
Stock market turnover	0.28	0.31	0.29	0.25	0.26	0.19	0.19	0.12	0.65	1.00		
Private bond issuance	0.42	0.23	0.42	0.37	0.47	0.17	0.18	0.29	0.39	0.38	1.00	
Private sector bank credit	0.51	0.33	0.74	0.69	0.76	0.57	0.56	0.62	0.76	0.49	0.61	1.00

Appendix IV. Robustness Checks

Table 10. Robustness Check of Other Governance Indicators				
	(1)	(2)	(3)	(4)
concentration	-0.00932*** (0.00322)	-0.00893*** (0.00326)	-0.00647* (0.00352)	-0.00996 (0.00606)
operating costs	0.202*** (0.0197)	0.204*** (0.0198)	0.214*** (0.0216)	0.198*** (0.0643)
transaction size	-1.473*** (0.156)	-1.598*** (0.154)	-1.655*** (0.156)	-1.605*** (0.226)
risk aversion-CAR	0.0372*** (0.0116)	0.0367*** (0.0117)	0.0351** (0.0137)	0.0350** (0.0157)
credit risk-provisions	0.00309*** (0.000662)	0.00316*** (0.000667)	0.00280*** (0.000782)	0.00315*** (0.000470)
GDP growth	1.785 (1.235)	1.300 (1.232)	2.294* (1.328)	1.414 (1.381)
inflation	0.251 (1.117)	0.295 (1.124)	1.006 (1.181)	-0.00884 (1.658)
prop right protection	-0.311*** (0.0897)			
judicial independence		-0.126* (0.0702)		
impartiality of courts			-0.119 (0.0934)	
ethics				-0.236* (0.124)
N	755	755	640	748

Table 11. Robustness Check for Endogeneity Using Instrument Variables*Voice, accountability, political stability indicators as instruments and lagged explanatory variables*

	(1)	(2)	(3)	(4)	(5)
concentration	0.00825* (0.00472)	0.00651 (0.00481)	0.00584 (0.00566)	0.00659 (0.00577)	0.00747 (0.00473)
operating costs	0.234*** (0.0490)	0.204*** (0.0506)	0.249*** (0.0625)	0.255*** (0.0628)	0.215*** (0.0497)
transaction size	-1.384*** (0.226)	-1.828*** (0.233)	-1.442*** (0.242)	-1.523*** (0.240)	-1.607*** (0.234)
risk aversion-CAR	0.0264 (0.0176)	0.0248 (0.0178)	0.0161 (0.0176)	0.0135 (0.0177)	0.0259 (0.0175)
credit risk-provisions	0.00499*** (0.00110)	0.00496*** (0.00112)	0.00544*** (0.00112)	0.00538*** (0.00113)	0.00496*** (0.00110)
GDP growth	3.202 (4.848)	-0.364 (4.982)	0.791 (5.773)	1.475 (5.828)	1.007 (4.944)
inflation	4.807** (2.325)	5.065** (2.402)	5.100* (2.719)	5.190* (2.747)	4.669** (2.294)
rule of law	-0.400** (0.155)				
regulatory quality		0.0199 (0.172)			
insolvency framework			-0.0123*** (0.00474)		
contract enforcement				-0.0159** (0.00769)	
control of corruption					-0.239* (0.130)
N	910	910	729	729	910

Table 12. Robustness Check for Cross-Sectional Dependence

	(1)	(2)	(3)	(4)	(6)
concentration	-0.00273* (0.00148)	-0.00664*** (0.00127)	-0.00198 (0.00214)	-0.00582*** (0.00197)	-0.00187 (0.00175)
operating costs	0.372*** (0.0726)	0.383*** (0.0753)	0.399*** (0.0936)	0.391*** (0.0875)	0.379*** (0.0728)
transaction size	-1.103*** (0.184)	-1.370*** (0.194)	-1.274*** (0.250)	-1.418*** (0.215)	-1.202*** (0.172)
risk aversion-CAR	0.0384*** (0.00809)	0.0353*** (0.00829)	0.0321*** (0.00450)	0.0320*** (0.00535)	0.0376*** (0.00875)
credit risk-provisions	0.00331*** (0.000653)	0.00339*** (0.000872)	0.00179** (0.000709)	0.00247** (0.00109)	0.00377*** (0.000707)
GDP growth	3.443** (1.561)	3.792*** (1.281)	4.139** (1.818)	3.477* (2.045)	3.874** (1.565)
inflation	1.757* (0.972)	2.272** (0.935)	2.323* (1.318)	3.270** (1.275)	2.121** (0.949)
rule of law	-0.551*** (0.0503)				
regulatory quality		-0.256*** (0.0775)			
insolvency framework			-0.0136*** (0.00242)		
contract enforcement				-0.0190*** (0.00261)	
control of corruption					-0.421*** (0.0427)
N	1102	1102	835	835	1102

Table 13. Robustness Check for Non-Linearity*Probit model with a cut-off point for the dependent variable set at the 75th percentile*

	(1)	(2)	(3)	(4)	(5)
concentration	-0.0111 (0.00759)	-0.0138* (0.00750)	-0.00865 (0.0103)	-0.00878 (0.0101)	-0.0110 (0.00770)
operating costs	0.293*** (0.0486)	0.299*** (0.0482)	0.309*** (0.0587)	0.306*** (0.0579)	0.300*** (0.0489)
transaction size	-0.831*** (0.311)	-1.133*** (0.308)	-0.949*** (0.350)	-1.086*** (0.336)	-0.959*** (0.302)
risk aversion-CAR	0.0494** (0.0233)	0.0463** (0.0233)	0.0877*** (0.0315)	0.0848*** (0.0314)	0.0456** (0.0232)
credit risk-provisions	0.00277** (0.00140)	0.00245* (0.00138)	0.00462*** (0.00179)	0.00415** (0.00177)	0.00288** (0.00142)
GDP growth	7.015** (2.926)	6.314** (2.894)	8.370** (3.497)	8.681** (3.497)	6.627** (2.908)
inflation	1.032 (1.356)	1.177 (1.360)	0.988 (1.825)	1.063 (1.799)	0.944 (1.368)
rule of law	-0.759** (0.295)				
regulatory quality		-0.213 (0.271)			
insolvency framework			-0.0289** (0.0125)		
contract enforcement				-0.0196 (0.0121)	
control of corruption					-0.606** (0.261)
N	1105	1105	836	836	1105

Table 14. Robustness Check with Lagged Dependent Variable

	(1)	(2)	(3)	(4)	(6)
lagged net int margin	0.571*** (0.0602)	0.586*** (0.0574)	0.604*** (0.0764)	0.603*** (0.0732)	0.575*** (0.0582)
concentration	-0.00147 (0.00223)	-0.00268 (0.00217)	-0.0000526 (0.00266)	-0.00116 (0.00250)	-0.00109 (0.00221)
operating costs	0.194*** (0.0660)	0.193*** (0.0658)	0.193*** (0.0609)	0.190*** (0.0584)	0.195*** (0.0663)
transaction size	-0.400*** (0.149)	-0.468*** (0.157)	-0.453** (0.197)	-0.487** (0.203)	-0.421*** (0.151)
risk aversion-CAR	0.0199** (0.00888)	0.0184** (0.00880)	0.00833 (0.0112)	0.00839 (0.0110)	0.0196** (0.00890)
credit risk-provisions	0.00165*** (0.000604)	0.00163** (0.000640)	0.00109** (0.000468)	0.00132*** (0.000476)	0.00179*** (0.000611)
GDP growth	1.390 (1.274)	1.455 (1.286)	0.642 (1.766)	0.337 (1.844)	1.511 (1.253)
inflation	0.650 (0.892)	0.796 (0.910)	1.446 (1.306)	1.721 (1.258)	0.746 (0.896)
rule of law	-0.182** (0.0844)				
regulatory quality		-0.0759 (0.0772)			
insolvency framework			-0.00392 (0.00275)		
contract enforcement				-0.00726** (0.00356)	
control of corruption					-0.144** (0.0671)
N	1102	1102	835	835	1102

Table 15. Robustness Check for Outliers

	(1)	(2)	(3)	(4)	(5)
concentration	-0.00227 (0.00159)	-0.00536*** (0.00164)	-0.00131 (0.00203)	-0.00633*** (0.00199)	-0.00206 (0.00168)
operating cost	0.795*** (0.0140)	0.801*** (0.0147)	0.812*** (0.0175)	0.803*** (0.0178)	0.819*** (0.0143)
transaction size	-0.334*** (0.0657)	-0.495*** (0.0679)	-0.461*** (0.0742)	-0.629*** (0.0693)	-0.421*** (0.0654)
risk aversion-CAR	0.0338*** (0.00677)	0.0356*** (0.00715)	0.0355*** (0.00894)	0.0338*** (0.00905)	0.0337*** (0.00697)
credit risk-provisions	0.00214*** (0.000537)	0.00249*** (0.000566)	0.000897 (0.000634)	0.00122* (0.000642)	0.00242*** (0.000554)
GDP growth	4.812*** (0.986)	5.275*** (1.042)	5.849*** (1.220)	5.147*** (1.244)	5.227*** (1.012)
inflation	-0.136 (0.573)	0.380 (0.615)	2.609*** (0.800)	3.853*** (0.799)	0.242 (0.586)
rule of law	-0.484*** (0.0455)				
regulatory quality		-0.312*** (0.0525)			
insolvency framework			-0.00995*** (0.00178)		
contract enforcement				-0.00828*** (0.00257)	
control of corruption					-0.336*** (0.0409)
N	1,102	1,102	835	835	1,102