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The Effect of Institutional Quality on Banking Performance in Emerging Countries

Summary: Banks play a crucial role in the economy and improving their performance leads to healthier economic activities. Therefore, the methods of efficiently measuring bank performance need to be highlighted. The "CAMELS" rating system has become the most comprehensive and contemporary measurement method in this context. Various factors, both bank-specific and country-specific, affect bank performance. Among these factors, the Worldwide Governance Indicators reflect the public's perception of institutional quality, a proxy for country-specific factors. This study aims to analyze the impact of the Worldwide Governance Indicators on bank performance, using a sample of 1649 banks in 26 emerging countries within the 2008-2018 period. The system GMM results demonstrate that these indicators significantly affect banking performance in different aspects and directions.

Keywords: Governance, CAMELS, Banking performance, Institutional quality, System GMM.

JEL: C33, C55, G18.

Following the 2008 economic crisis, regulators and legislators in emerging economies released several banking industry regulations in light of the good practices used by developed countries to keep their financial institutions healthy and to protect the investors. They also set up bankruptcy procedures. Their common purpose was to increase bank performance. Prior research proves the positive effect of banking reforms and regulations on banks' cost and profit efficiencies by applying a variety of performance measurement methods (Emmanuel Mamatzakis, Antonios Nikolaos Kalyvas, and Jenifer Piesse 2013; Serdar Ozkan, Cagnur Balsarı, and Secil Varan 2014). Among these methods, the CAMELS rating system is one of the most up-to-date and comprehensive, given that it measures bank performance using six dimensions (Mihir Dash 2021).

This study aims to examine the effect of institutional quality, as represented by the Worldwide Governance Indicators (WGI), on banking performance, using a sample of 1649 banks from 26 emerging countries between 2008 and 2018. The results emphasize that banking performance depends not only on the banking operations themselves, but also on the country's general outlook. Considering the variables included, this study is a prime candidate for inclusion in the limited number of studies

that examine the relationship between quality of governance and bank performance. Additionally, the period under study is crucial as it covers the effects of the economic crisis. During this period, bank performance played an essential role in stabilizing economies. Furthermore, making emerging countries the focus of the study will help us to reveal their banking performance in the post-crisis period.

The following section presents the theoretical background of institutional quality and its expected effects on banking performance. The data and methodology are presented in the second section, while the empirical results are explained in the third. Conclusions are then proffered in the last section.

1. Literature Survey

Performance is driven not only by the managerial operations of banks but also by external factors, including the determination of macroeconomic policies and regulations by legal authorities, which significantly impact bank performance. In this regard, several studies examine the impact of institutional improvement on the development of financial systems. For example, Yongfu Huang (2010) found that, in the short term, institutional quality has a positive impact on financial development in lower-income economies. In turn, Menzie D. Chinn and Hiro Ito (2006) revealed that having a higher degree of institutional development helps countries benefit more from financial liberalization. Additionally, Siong Hook Law (2009) concluded that institutional improvement was more significant than competition in the promotion of financial development. Finally, Law and W. N. W. Azman-Saini (2012) found a positive relationship between the dimensions of institutional quality and financial development, as measured by the development of the banking industry.

Some studies have shown that, aside from financial development, banking crises can also be related to the quality of the institutional environment. The common finding of these studies is that good governance reduces the probability of banking crises and keeps financial systems more stable (Hichem Saidi, Houssem Rachdi, and Nidhal Mgadmi 2016; Daniela Balutel 2020; Mohamed Belkhir et al. 2020).

As a tool for comparing and ranking countries based on their scores in governance effectiveness, the World Bank developed the Worldwide Governance Indicators (WGI) by analyzing the data from 215 countries between 1996 and 2013 (Laura Langbein and Stephen Knack 2010; Rajesh Sund 2013; Bogdan Dima, Oana-Ramona Lobonţ, and Nicoleta-Claudia Moldovan 2016; Amaryllis Mavragani, Ioannis E. Nikolaou, and Konstantinos P. Tsagarakis 2016). The data reflected the opinions of a large number of enterprises, citizens and experts, who responded to surveys on six different governance dimensions, the combined performance of which represents the perceived effectiveness of governance (Mohammad Hossein Setayesh and Abbas Ali Daryaei 2017; Isabel Gallego-Álvarez, Miguel Rodríguez-Rosa, and Purificación Vicente-Galindo 2021). Policymakers rely on these indicators to assess a country's governance when providing foreign aid.

The *Voice and Accountability* indicator captures the perceived freedom of citizens to participate in elections, express their ideas and form associations (Langbein and Knack 2010; Sund 2013). In other words, it can be viewed as a measure of citizens' ability to hold the government accountable and raise their voices against any

malpractices (Langbein and Knack 2010; Syed Sohaib Zubair and Mukaram Ali Khan 2014). From a similar perspective, Stephen H. Haber (2008) suggests that when an institution encourages political competition, this results in more competitive and efficient banking systems. Therefore, the presence of a mechanism for freedom of expression and subsequent accountability is accepted as an indicator of good governance.

The *Political Stability and Absence of Violence* indicator measures the perceived probability of destabilization or the overthrowing of the government in an unconstitutional manner, such as terrorism (Langbein and Knack 2010; Sund 2013; Zubair and Khan 2014). Studies have revealed that political instability negatively affects economic performance (Sourafel Girma and Anja Shortland 2008; Zubair and Khan 2014) and increases the likelihood of banking crises (Ali Compaoré et al. 2020).

The *Government Effectiveness* indicator reflects the citizens' level of satisfaction with the quality of public services and civil services, together with the government's level of independence from political pressures and effectiveness in policy formulation (Sund 2013; Zubair and Khan 2014). According to César A. Calderon, Alberto Chong, and Arturo José Galindo (2001), the degree of trust that citizens feel has a significant and positive effect on the efficiency of financial intermediaries. Additionally, Girma and Shortland (2008) also reflected that a stable and democratic regime provides the appropriate environment for improvements in banking systems.

In a similar vein, *Regulatory Quality* is another indicator that is related to governmental success. This indicator focuses on a government's ability to formulate and implement sound policies and regulations, thereby boosting the development of the private sector (Sund 2013; Zubair and Khan 2014). Achieving a higher score in this indicator signifies that citizens believe that the regulatory quality and government support of the private sector is higher. It is suggested that countries with better regulatory quality have fewer restraints in financial markets (Navaz Naghavi and Wee-Yeap Lau 2014), thus leading to economic development, seeing as it provides the opportunity for financial institutions to efficiently control their costs and reduce risks (Georgios E. Chortareas, Claudia Girardone, and Alexia Ventouri 2013). Balutel (2020) also states that improving regulatory quality minimizes the likelihood of banking crises. On the other hand, Svatopluk Kapounek (2016) has made a distinction between the various effects of regulatory quality over time, claiming that a low-risk environment with high-quality regulations provides benefits in the long term, while in the short term it may result in poor borrowing practices in borrowers and thus negatively affect the banks.

In turn, a high score in the *Rule of Law* indicator is ensured when citizens comply with the defined rules and are accountable and transparent in their activities (Zubair and Khan 2014). Therefore, a high score herein expresses a high level of confidence felt by citizens regarding their current legal system as an essential part of the governance system. According to Naghavi and Lau (2014), higher Rule of Law indicator rates imply the robust legal enforcement of contracts and judicial independence. Therefore, countries which rate higher in the Rule of Law indicator are more likely to have more stable banking systems (Sylviane Guillaumont Jeanneney and Kangni Kpodar 2006) and a lower risk of banking crises (Balutel 2020).

Control of Corruption, the last component of the WGI, indicates the perception of the extent to which public resources are sacrificed or public power is exercised for

private gain by some parties, independently of the level of corruption. Whilst Fabio Mendez and Facundo Sepulveda (2006) state that a low level of corruption is beneficial for economic growth, many other studies prove the negative relationship between the level of corruption and economic growth (Christian Ahlin and Jiaren Pang 2008; Balutel 2020). According to Kapounek (2016), with lower levels of corruption, regulatory authorities function more efficiently, producing a positive effect on banks' lending activities. On the other hand, Naghavi and Lau (2014) have found opposite results for corruption, compared to all other dimensions of the WGI. The main reason for this contrast supposedly stems from the conceptualization of the control of corruption, as the concept reflects the perception of the intrusiveness of a country's bureaucracy.

The WGI have individual variables within these six dimensions, each taking values between 0 and 1. Values closer to 1 reflect better governance. Additionally, according to this assumption, while the error terms of the countries show a normal distribution, the variance differs among variables. Therefore, the margins of error resulting from the estimates do not prevent comparisons between countries (Daniel Kaufmann, Aart Kraay, and Massimo Mastruzzi 2010). The scope of the indicators allows them to be compared with each other and provides testability in some respects. However, the methodological structures behind the WGI make measurement complex and it is even more challenging to observe data because some indicators are intangible and non-quantitative (Melissa A. Thomas 2009).

Moreover, the data obtained from the surveys depends on the subjective evaluations of the institutions, non-governmental organizations and public institutions, which means they are "perception-based". Although the scope and definition of the indicators and theoretical background are open to discussion, the WGI are still the most commonly used tools for comparing countries based on the six dimensions (Kaufmann, Kraay, and Mastruzzi 2010; Aikozha Absadykov 2020), and they play a decisive role in countries' political choices. Therefore, the WGI offer the most comprehensive and multidimensional approach and they are used in this study whilst accepting doubts about the adequacy of the measurements.

2. Data and Methodology

2.1 Data

We have used annual financial data from commercial banks operating in 26 emerging economies between 2008 and 2018 to calculate the CAMELS ratings. Our sample consists of 1649 banks. The data used in the study was collected from the Bankscope database. All countries in the definitions of the Financial Times Stock Exchange (FTSE), MSCI Emerging Markets Indexes (MSCI) and S&P Global Ratings (S&P), which contain the most comprehensive country lists, were used to determine the emerging countries. The data on countries and the number of banks in each country are listed below in Table 1.

Table 1 Number of Banks by Country

Country	Number of banks
United Arab Emirates	24
Brazil	131
Chile	21
China	216
Colombia	20
Czechia	21
Egypt	26
Greece	6
Hungary	23
India	71
Indonesia	110
Malaysia	33
Mexico	59
Morocco	13
Pakistan	26
Peru	25
Philippines	51
Poland	87
Qatar	8
Romania	21
Russia	510
South Africa	16
South Korea	20
Taiwan	48
Thailand	28
Turkey	35

Source: Authors' compilation.

Performance Scores and the CAMELS Rating System

A traditional method to measure bank performance uses variables such as Return on Assets (ROA) or Return on Equity (ROE). Alternatively, economic indicators, such as Economic Value Added (EVA) and Risk-Adjusted Return on Capital (RAROC), and market-based measures, such as credit default swap and price/earnings ratios, are used to measure bank performance (John Karr 2005). Although it is a frequently applied method, it may be misleading to use ratios that measure performance only in terms of profitability, capital adequacy or asset quality. While investors consider profitability as the key financial performance indicator for banks, other aspects should also be considered. In this context, bank performance can be measured by combining various perspectives, including profitability, riskiness and efficiency, depending on subjective assessment. It is crucial to consider the structure of the banking industry when choosing the best performance assessment method. Accordingly, several studies employ a variety of multi-criteria decision models in performance measurement: The System to Estimate Examination Ratings (SEER), the Statistical CAMELS Off-Site Rating (SCOR) and the Growth Monitoring System (GMS), as well as the CAMELS rating system.

Originally named the Uniform Financial Institutions Rating System (UFIRS), the CAMELS rating system has been one of the most frequently used tools for measuring banking performance in recent years. It was developed by the U.S. audit authorities primarily to make an overall assessment during risk-based audits of commercial banks. As a result, CAMELS is an accurate system for predicting default risks whilst also evaluating bank performance (Fentje Salhuteru and Fransina Wattimena 2015).

The acronym "CAMELS" stems from the six components of the system: (1) Capital Adequacy, (2) Asset Quality, (3) Management Quality, (4) Earnings, (5) Liquidity, and (6) Sensitivity to Market Risks. The Sensitivity to Market Risks dimension (S) was added to the system upon recognizing the need to take interest and exchange rate risks into consideration, especially during financial crises.

Among these six dimensions, *Capital Adequacy* represents a bank's financial strength. It shows whether a bank has adequate capital to support its risky assets. In other words, it reflects the distance to probable financial distress (Fangyuan Guan et al. 2019; Pasquale Paolicelli, Ilona Tregub, and Victor Byvshev 2021). The Equity to Total Assets ratio is usually used for the score in this indicator. Consensus has not yet been reached on the relationship between this dimension and banking performance. When a bank prefers capital-intensive financing, this causes lower risk. Some authors suggest that this increases performance, as it results in reduced funding costs (Aslı Demirgüç-Kunt and Harry Huizinga 1999; Sami Ben Naceur and Mohamed Goaied 2008), whereas other authors relate lower risk with lower profitability, in line with the risk-return hypothesis (Andreas Dietrich and Gabrielle Wanzenried 2011; Marijana Ćurak, Klime Poposki, and Sandra Pepur 2012).

The second dimension, *Asset Quality*, represents the riskiness of a bank's assets. In other words, it examines the quality of those assets, considering the ability of the assets to be converted into cash. Since a bank's assets are mostly made up of loans, most of the criteria for this dimension measure collectability. Some authors assess asset quality by measuring the proportion of loan-loss provisions in total loans, because they relate it with credit risk (Demirgüç-Kunt and Huizinga 1999; Panayiotis Athanasoglou, Sophocles N. Brissimis, and Matthaios D. Delis 2008; Kyriaki Kosmidou 2008; Paolicelli, Tregub, and Byvshev 2021). Higher values in this indicator reflect lower asset quality and lower banking performance simultaneously (Dietrich and Wanzenried 2011; Jeroen Klomp and Jakob de Haan 2015; Roger Antoun, Ali Coskun, and Bojan Georgievski 2018; Paolicelli, Tregub, and Byvshev 2021).

In turn, *Management Quality* has a broader perspective to evaluate compared to other dimensions. Education level, experience and specialization in management are taken into account for this dimension. In this respect, M stands for the managerial capacity of the bank's directors to reveal, measure and eliminate the risks regarding the bank's operations. Additionally, cost efficiency, as measured by the ratio of operating expenses to total assets (or gross income), is usually accepted as another determinant of managerial adequacy (Mohamed Rochdi Keffala 2021). When approaching management quality from a cost-efficiency perspective, higher values for this ratio reflect lower management quality (Athanasoglou, Brissimis, and Delis 2008; Dietrich and Wanzenried 2011; Abdul Rashid and Sana Jabeen 2016; Antoun, Coskun, and Georgievski 2018).

The *Earnings* dimension reflects a bank's ability to generate income and also the quality of its earnings. Given that the primary source of revenue for banks is interest, the proportion of income from non-interest-bearing activities in total income is considered a measure of earnings quality, with higher proportions reflecting a lower quality of the earnings (Dietrich and Wanzenried 2011; Ćurak, Poposki, and Pepur 2012). The most common measures used when assessing the income generation ability of a bank are Return on Assets (ROA) and Return on Equity (ROE), representing the percentage of income generated using specified amounts of assets and equity, respectively (Hasan Dincer et al. 2011; Ćurak, Poposki, and Pepur 2012; Paolicelli, Tregub, and Byvshev 2021).

The Liquidity dimension analyzes a bank's ability to meet its obligations. Banks' adoption of different methods of using their liquid assets and credit policies is essential to their liquidity risks. In line with this, some authors measure liquidity risk by using the ratio of loans to deposits (Kosmidou 2008; Ćurak, Poposki, and Pepur 2012). A lower loan-to-deposit ratio reflects higher liquidity for a bank. However, investment in liquid assets, which have a lower rate of return, results in lower profitability.

The last dimension, *Sensitivity to Market Risks,* is added to the model by measuring the banking industry's vulnerability to risks (such as credit risks) and exposures (such as foreign exchange and interest rate exposures) in the market. The level to which banks invest in financial instruments in the market is an indicator of this dimension, along with their relative dependence on foreign exchange in their assets or liabilities, or the size of their assets relative to the industry (Ćurak, Poposki, and Pepur 2012; Guan et al. 2019).

Ratios are the fundamental inputs for calculating a bank's financial performance scores. Therefore, we have used 25 different financial ratios to calculate the bank performance scores. The weights of these ratios are determined by considering previous studies. The ratios and their weights are reported in the Appendix.

First, for calculating the banks' financial performance scores, the yearly averages for all financial ratios were calculated and taken as the reference values for the respective ratios. The total weighted deviation values for the six sub-components of the CAMELS system were obtained by adding the weighted deviation values of the financial ratios. Each bank's annual financial performance score was calculated by summing the products of the weights and weighted deviation values for each component. The banks' financial performance scores and the scores for each sub-component are used as dependent variables to proxy for the bank performance criteria in this study.

The banks' financial performance scores and each sub-component are dependent variables that proxy for the bank performance criteria in this study. The sub-dimensional performance scores are determined using a scale of 1 to 5 points for each dimension, with 1 given to the best banks and 5 for the worst banks.

The comments made on the observed scores depend on the definitions of the Board of Governors of the Federal Reserve System that are included in the Commercial Bank Examination Manual (Rebel Allen Cole and Jeffery W. Gunther 1995). According to these definitions, a bank with a composite score of 1 is sound in every respect but when its score is 2, it is deemed to have modest weaknesses. In turn, a score of 3

reflects the presence of financial, operational and compliance weaknesses that cause supervisory concern, and scoring 4 is indicative of serious financial weaknesses that may impair future viability. Finally, a bank which scores 5, the worst score, has critical financial weaknesses that lead to an extremely high probability of imminent failure.

As shown by the definitions of these scores, the CAMELS score helps estimate a bank's failings (Maryam binti Badrul Munir and Ummi Salwa Ahmad Bustamam 2017). Additionally, comments on these scores are not valid for long-term evaluations, as they depreciate quickly (Cole and Gunther 1995). Additionally, Beverly J. Hirtle and Jose A. Lopez (1999) found that private supervisory information embedded in past CAMELS scores can provide further insight into a bank's current situation.

It is worth noting that since the CAMELS rating system provides a comprehensive view of banking performance, any changes in CAMELS scores may not be the product of bank-specific factors. Rather, country-level factors (monetary policy, public wealth, etc.) can affect banking performance. In other words, the legal and regulatory infrastructure in a country provides the general framework for the banks to operate in. Therefore, the accuracy of the government is a crucial factor to consider when assessing banking performance.

Despite all the positive aspects mentioned, the CAMELS approach also has some drawbacks. Since some of the data is collected through surveys, it is affected by the subjectivity of those who fill out said surveys, and this may lead to inconsistency in measurements due to differences in perspectives. It has been observed that they are inadequate in the measurement of bank performance, especially in times of crisis when economic expectations change rapidly. In addition, F. A. Maude and Ahmad Bello Dogarawa (2016) emphasized that although the CAMELS analysis explains the performance of banks better than other rating systems, the results obtained are controversial because the measurement of the data used in the calculation of the individual CAMELS components may differ between countries.

As independent variables, the Worldwide Governance Indicators represent the perceived effectiveness of governance based on cross-country rankings. The scope and generality of the indicators allow comparisons to be drawn and they provide testability in some respects. Therefore, the descriptions of the indicators should be precise and standardized. However, the methodological structures behind the WGI complicate the taking of measurements because some of these indicators are intangible and non-quantitative, making it challenging to even observe the data (Thomas 2009). In addition, the methods used in the measurements, surveys and expert comments are not made available for public access, thereby increasing doubts about the adequacy of said measurements (Langbein and Knack 2010).

There are also discussions about the accuracy of the data collection methods. For instance, the data obtained from surveys depends on subjective evaluations of institutions, non-governmental organizations and public institutions, which means they are "perception-based". Additionally, the scope and definition of the indicators and theoretical background have been questioned. However, the WGI indicators are still the most commonly used tools to compare countries based on the six dimensions (Kaufmann, Kraay, and Mastruzzi et al. 2010) and they play a decisive role in countries' political choices. Therefore, the WGI, which offer the most comprehensive and

multidimensional approach, are used in this study whilst accepting existing doubts about the adequacy of the measurements.

Bank size, inflation and growth were added to the model as control variables, in order to capture the effects of omitted variables and country-specific attributes. *Bank size*, the first control variable, is accepted as a vital factor for creating trust in banks and improving their sensitivity to shocks in the market (Ali Shaddady and Tomoe Moore 2019). Additionally, larger banks have the opportunity to increase their lending activities using the greater financial openness and economic freedom they have compared to small banks (Kapounek 2016). Therefore, a bank's size is said to have a positive relationship with its performance.

Inflation, the second control variable, is claimed to impede the stability of financial markets. This is because banks are incentivized to increase loan rates and gain more income in inflationary environments. However, this may interrupt the bank's performance by increasing the risk of defaults among the borrowers. In line with this, Klaus Schaeck and Martin Cihak (2012) also found that inflation negatively affects the quality of banks' assets, while Shaddady and Moore (2019) proved that this probability increases, especially in less developed countries. In summary, inflation does not have a well-determined direction and may have mixed implications in banking systems.

As the last control variable, *Growth* is expected to have a positive effect, seeing as it improves market stability and decreases uncertainty when there is stable economic growth (Shaddady and Moore 2019).

2.2 Methodology

We estimate a dynamic, unbalanced panel, including 1649 banks from 26 emerging countries between 2008 and 2018. The model is:

$$(y)_{(i,j)t} = \mu(y)_{(i,j)t-1} + \beta(x^k_{(i,j)t}) + \delta(x^k_{(i,j)t-1}) + \varepsilon_{i,jt},$$

where y is a dependent variable of bank i in country j at time t. We include the lagged level of the dependent variable to control the autoregressive tendencies. Vector x^k is a vector of independent variables, and x^k_{t-1} is a vector of first-lagged independent variables containing k elements. Lastly, $\varepsilon_{i,jt}$ is the error term.

Based on the six components of the CAMELS rating system and the total scores of the countries, we estimate seven different models. We also add the lagged values of these variables into the model as independent variables to capture the autoregressive tendencies. Additionally, six indicators of the WGI (Voice and Accountability, Political Stability and Absence of Violence, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption) are also added into the model as independent variables.

The generalized method of moments (GMM) estimator, proposed by Manuel Arellano and Stephen Bond (1991), is heavily used in the literature to estimate the parameters in a linear dynamic panel data model. However, in the dynamic panel data framework, lagged dependent variables are highly correlated with panel-level effects, thus making standard error estimation highly inconsistent. Hence, the OLS method of estimation cannot be used. This led to Arellano and Olympia Bover (1995) and Richard

Blundell and Bond (1998) proposing a systems-based approach to overcome these limitations in dynamic panel data models.

Arellano and Bond estimators use the first difference in the equation to remove the fixed effects and then use instruments to form moment conditions. The system GMM is the augmented version of the GMM. According to Blundell and Bond (1998), lagged levels are often poor instruments for first differences, especially for variables close to a random walk. Therefore, the original equations in levels can be added to the system so that the additional moment conditions could increase the efficiency. In these equations, predetermined and endogenous variables in levels are instrumented with suitable lags of their first differences. The system GMM estimator improves precision and reduces the finite sample bias problem. Furthermore, restricting the number of instruments used in the system GMM estimation by using only two lags in the first-differenced equations can improve the efficiency of the system GMM estimation (David Roodman 2006).

The specification tests proposed by Arellano and Bover (1995) are also implemented to test the validity of the instruments in the system GMM estimation. The Arellano-Bond test for serial correlation is adapted to test whether there is a second-order serial correlation in the first-differenced residuals. The null hypothesis is that the residuals are serially uncorrelated. If the null hypothesis cannot be rejected, it provides evidence that there is no second-order serial correlation and that the GMM estimator is consistent. The Hansen *J*-test is applied to test the null hypothesis of instrument validity and the validity of the additional moment restriction needed for the system GMM.

3. Empirical Results

This section presents the estimation results for the effect of institutional quality on banking performance using the system GMM. Within this frame of analysis, six different models are developed and reported in Table 2, based on the six components of the CAMELS rating system. We used a two-step procedure with orthogonal deviations in order to obtain more robust results. However, the consistency of the GMM estimators depends on the validity of the instruments. Therefore, we applied two specification tests to compensate for this inconsistency: (1) the Arellano-Bond test for serial correlation; (2) the Hansen test for instrument validity.

All models have an autoregressive character, so the GMM seems to be the best method for analyzing the potential relationship between banking performance and governance indicators. Moreover, all models in Table 2 are robust and consistent under the Arellano-Bond test restrictions for serial correlation and the Hansen test for instrument validity.

In the model in which Capital Adequacy is the dependent variable, the first lag of the dependent variable is significant. It proves the autoregressive tendencies of the model. All variables used as proxies of institutional quality are also significant. Although a positive relationship is expected between the components of the CAMELS rating system and the governance indicators, and even though they are significant, all variables except for Rule of Law and Control of Corruption have unexpected signs. In

the model, Growth is insignificant, whereas other control variables, including Inflation and Size, are significant.

Table 2 Findings on the Relationship between WGI and CAMELS

	Dependent variables					
	C	A	M	E	L	S
Lagged dependent variable	**.16474** [.06840]	**.12687** [.06692]	**17052** [.02806]	**.36822** [.06065]	**.25062** [.03901]	**.08231** [.03642]
Voice and accountability	**-25.654** [12.084]	**-36.023** [21.011]	**-3.5807** [2.1941]	-.81250 [5.4039]	**-7.8074** [1.7537]	**-30.457** [15.242]
Political stability and absence of violence/Terrorism	**-27.708** [11.447]	**-58.513** [31.339]	**-6.0820** [2.9475]	-.13963 [5.5165]	**9.1623** [1.9934]	**-18.541** [5.3044]
Government effectiveness	**-38.925** [16.099]	**104.7113** [49.396]	**-15.077** [6.7789]	**-47.831** [14.531]	2.6311 [4.3515]	**-94.768** [23.640]
Regulatory quality	**-35.011** [20.025]	58.544 [48.348]	-5.6147 [5.8278]	**110.62** [28.591]	**16.213** [3.5453]	11.068 [15.848]
Rule of law	**88.324** [38.029]	51.124 [50.686]	-.25137 [8.0004]	**-83.182** [18.927]	**-21.498** [5.5071]	**55.641** [30.212]
Control of corruption	**45.906** [19.225]	-32.959 [71.296]	**17.719** [5.8177]	**26.803** [15.494]	**-7.9198** [3.6304]	10.909 [13.645]
Growth	-1.0486 [2.0304]	**7.7641** [4.6608]	**1.2428** [.59897]	**13.471** [4.6149]	**-.72441** [.15523]	**-3.8804** [1.5888]
CPI	**-1.6569** [.62961]	**2.1322** [1.3107]	**-.31352** [.05409]	**1.3820** [.60853]	**.36695** [.03584]	**-.73690** [.23041]
Size	**-97.373** [32.974]	-82.017 [64.595]	**4.4270** [.75107]	**-21.959** [9.7619]	**-5.6907** [.53809]	**11.156** [3.3317]
AR[1] *p-value*	0.000	0.000	0.005	0.000	0.000	0.000
AR[2] *p-value*	0.456	0.591	0.993	0.845	0.779	0.274
Hansen test [*p-value*]	0.189	0.218	0.245	0.167	0.158	0.171

Notes: ***/**/* indicate significance levels of 1, 5, and 10%, respectively. Robust standard errors are shown in parentheses. Year dummies are used for all years within the timespan.

Source: Authors' compilation.

The model in which Asset Quality is taken as the dependent variable also shows autoregressive attributes because the first lag of the dependent variable is significant. The Voice and Accountability, Political Stability, and Government Effectiveness variables are significant, but Voice and Accountability and Political Stability have unexpected signs. Additionally, Growth and Inflation have significant effects on Asset Quality.

We also find significant relations between Management Quality and the first lag of the dependent variable, Accountability, Stability, Government Effectiveness and Control of Corruption. Even though they are significant, the signs of all variables are not as expected, except for Control of Corruption. Additionally, all control variables are significant.

In the model where Earnings are the dependent variable, there are indications of autoregressive tendencies because the first lag of the dependent variable is significant. Furthermore, Government Effectiveness, Regulatory Quality, Rule of Law and Control of Corruption are significant. However, Government Effectiveness and Rule of Law have unexpected signs. All control variables are also significant.

In the model where Liquidity is used as the dependent variable, the first lag of the dependent variable is significant. The Accountability, Political Stability, Regulatory Quality, Rule of Law and Control of Corruption variables are significant. Contrary to expectations, Accountability, Rule of Law and Control of Corruption have negative signs. Also, Liquidity has a significant relation with all control variables in the model.

The model results with Sensitivity to Market Risks as the dependent variable show that the model has autoregressive tendencies. There is a significant relationship between Sensitivity to Market Risks and the Voice and Accountability, Political Stability, Government Effectiveness and Rule of Law variables. The signs for Voice and Accountability, Political Stability and Government Effectiveness are also unexpected. All control variables are significant.

Overall, the results suggest that institutional quality may affect all dimensions of the CAMELS rating system. This seems logical, considering that institutional quality shapes the economy. As the principal components of the economy, banks cannot isolate themselves from this process, for better or for worse. This fact is reflected in the results presented in Table 2. However, some unexpected signs were observed among the variables with significant results. One of the common roots of these unexpected directions may be related to the perception of high institutional quality by both the banks and the public. The perception of increased institutional quality, represented by improvements in WGI, can have an effect on stakeholders, resulting in an increased demand for loans, for example. Some of this demand may have been converted into bad loans, as the expectations were unmet. This may therefore explain the damages to the asset quality of banks.

In a similar vein, this overconfidence may have resulted in some banks running the risk of operating with lower capital adequacy ratios and borrowers taking out loans with longer payback periods, leading to diminishing liquidity for those banks. A higher level of institutional quality may also cause lower interest rates. Lower interest rates decrease banks' operating and non-operating income, being partially derived from managerial adequacy. Another potential root cause of the unexpected signs may be sampling issues, given that the sample is comprised of banks from emerging markets. The market structures of emerging countries, which create the infrastructure for various market risks, may differ from each other to such an extent that determining the presence of any relationship structures in the model is prevented. In addition to these issues, there may be other problems which stem from the period covering the 2008 economic crisis. Because of this crisis, many emerging economies within the study still have not attained economic stability and their recovery is still in progress.

To enhance the reliability of the findings delineated in Table 2, the model was recalibrated using alternative independent variables that are closely aligned with the World Governance Indicators. These substitute variables[1], referred to herein as proxies, were meticulously chosen to ensure the closest possible alignment with the original indicators. For instance, in lieu of Voice and Accountability, we utilized Freedom of Expression and Belief as measured by Freedom House. Even though this was not an identical counterpart, it served as the most proximate available substitute, illustrating

[1] No variable could be found to replace Political Stability and Absence of Violence/Terrorism. Therefore, the alternative model was produced without adding this variable.

our thorough approach to the selection of variables. In anticipation of potential multicollinearity issues within our model, a proactive strategy was employed. Rather than solely using Government Effectiveness, we incorporated two distinct variables: Functioning of Government and Government Integrity, as measured by Freedom House and the Heritage Foundation's Index of Economic Freedom, respectively. This division effectively reduced the risk of multicollinearity, thereby enhancing the model's structural integrity. Furthermore, Regulatory Quality was replaced by Regulatory Efficiency, also sourced from Freedom House. These two variables are considered to have closely related definitions. In the case of the Rule of Law variable, we used both the Rule of Law as calculated by Freedom House and Judicial Effectiveness as calculated by the Heritage Foundation's Index of Economic Freedom. The conceptual proximity of these variables supports the consistency of our analytical framework. Lastly, the Corruption Perception Index was utilized in place of Control of Corruption. This index, designed to gauge the prevalence and normalized perception of corruption, operates inversely to Control of Corruption, thus providing a nuanced understanding of corruption dynamics within the investigated contexts.

Table 3 Findings on the Relationship between Alternative Variables and CAMELS

	Dependent variables											
	C		A		M		E		L		S	
Lagged dependent	**.175**** [.072]	**.164**** [.0683	**.147**** [.069]	**.158**** [.082]	**.192***** [.033]	**.187***** [.028]	**.379***** [.079]	**.377***** [.071]	**.259***** [.044]	**.247***** [.028]	**.088**** [.041]	**.085**** [.039]
Freedom of expression and belief	**-5.01**** [2.68]	**-5.14**** [2.75]	**-6.12**** [3.57]	**-6.18**** [3.17]	-.181 [3.86]	-.228 [3.97]	-.002 [2.11]	-.019 [2.42]	-31.39 [10.97]	-30.38 [10.76]	-16.38 [8.19]	-16.35 [8.15]
Functioning of government	**-17.8**** [7.21]		**85.5**** [31.4]		**-13.6**** [5.18]		**-37.4***** [11.8]		4.82 [5.18]		**-74.1***** [18.4]	
Government integrity		**-13.4**** [5.58]		**91.1**** [33.1]		**-11.6**** [3.98]		**-28.4**** [7.92]		6.96 [7.29]		**- 61.8***** [13.8]
Regulatory efficiency	**-21.6*** [11.5]	**-20.1*** [10.6]	55.5 [44.2]	56.7 [46.3]	-4.13 [4.28]	-5.74 [5.98]	**91.2**** [18.9]	**91.3**** [19.7]	**11.1***** [2.31]	**11.15***** [2.3]	19.9 [17.5]	16.9 [12.1]
Rule of law	**85.5**** [36.8]		91.6 [68.8]		-.055 [5.12]		**-75.2**** [14.2]		**-19**.3***** [4.75]		**42.5*** [25.2]	
Judicial effectiveness		**32.2**** [17.9]		65.7 [57.8]		-.137 [4.41]		**-45.3**** [9.18]		**-11**.2***** [2.57]		**23.5*** [13.9]
Corruption perception	**-5.62**** [9.18]	**-5.71**** [9.81]	9.14 [5.97]	4.21 [4.72]	**-6.11**** [3.62]	**-6.21**** [3.79]	**-18.7*** [12.3]	**-18.8*** [12.4]	**6.82*** [2.89]	**6.85*** [2.94]	-5.222 [4.24]	-5.18 [4.04]
Growth	-1.07 [2.04]	-1.11 [2.18]	**7.61*** [4.18]	**7.67*** [4.19]	**1.53 **** [.872]	**1.61 **** [.922]	**13.8***** [4.83]	**13.8***** [4.95]	**-.762***** [.157]	**-.771***** [.158]	**-3.86**** [1.47]	**-3.92**** [1.62]
CPI	**-1.72***** [.689]	**-1.86***** [.721]	**2.21*** [1.42]	**2.34*** [1.59]	**-.347***** [.066]	**-.3386***** [.06]	**1.41**** [.619]	**1.49**** [.656]	**.399***** [.044]	**.385***** [.041]	**-.751***** [.251]	**-.746***** [.357]
Size	**-95.8***** [30.8]	**-93.8***** [28.1]	-83.3 [65.7]	-78.4 [61.9]	**4.47***** [.797]	**4.48***** [.812]	**-22.4**** [9.87]	**-22.4**** [9.98]	**-5.71***** [.617]	**-5.72***** [.621]	**12.2***** [4.19]	**12.1***** [3.81]
AR[1] *p-value*	0.001	0.001	0.001	0.001	0.004	0.004	0.001	0.001	0.000	0.000	0.001	0.001
AR[2] *p-value*	0.561	0.503	0.583	0.551	0.987	0.979	0.852	0.844	0.771	0.651	0.362	0.351
Hansen test [*p-value*]	0.171	0.165	0.301	0.325	0.231	0.239	0.182	0.195	0.171	0.197	0.186	0.175

Notes: ***/**/* indicate significance levels of 1, 5, and 10%, respectively. Robust standard errors are shown in parentheses. Year dummies are used for all years within the timespan.

Source: Authors' compilation.

Table 3 shows that the lagged value of the dependent variable is significant for all models. As previously mentioned, this can be considered as evidence that the models contain autoregressive processes. Additionally, the models displayed maintained

robustness and consistency, adhering to the Arellano-Bond test constraints for serial correlation and the Hansen test for instrument validity.

In the model where Capital Adequacy is used as the dependent variable, all substitute variables used instead of the WGI variables are significant. Here, it is particularly important to highlight the fact that despite the Rule of Law and Judicial Effectiveness variables being included in the model as substitutes for a single variable, their coefficients differ significantly. This variance indicates differences in the methodologies used to calculate them. It also demonstrates that incorporating both variables as alternatives to the Rule of Law variable does not compromise the model's integrity. Although the levels of significance of the variables vary compared to those in Table 2, the interpretation thereof does not differ in terms of the general evaluation. It can be noted that while the coefficients of the control variables in the model exhibit variability, their significance levels and directional signs remain consistent. Indeed, it is important to emphasize that such stability was anticipated. Assuming there are no structural deficiencies in the model's configuration, dramatic shifts in the control variables would not typically occur.

The results of the model in which Asset Quality is the dependent variable are very similar to those in Table 2. The first lag of the dependent variable is significant. It appears as though the Regulatory Effectiveness, Rule of Law, Judicial Effectiveness and Perception of Corruption variables are insignificant. Again, we can see that the coefficients of the variables have changed, but this does not change the general structure of the model.

In the model where Management Quality is used as a dependent variable, the first noticeable change is related to Freedom of Expression and Belief. This variable was used in place of Voice and Accountability and, in contrast to that seen in Table 2, it was found to be insignificant. It has been stated previously that these results are entirely normal because these two variables are not identical. However, this result is of great value as it shows that using the two variables interchangeably will cause some issues. Even though, with the exception of Freedom of Expression and Belief, the coefficients of the other variables vary, their significance levels are parallel to the variables in Table 2. However, the significance level of the Corruption Perception Index increased to 5%. This shows that corruption perception indexes are more useful, at least for this dependent variable.

Upon comparing the model that utilized Earnings as the dependent variable with the data presented in Table 2, notable differences emerge. Noteworthy among these is that the significance of Government Integrity, the variable which substituted Government Effectiveness, increased to 5%. This improvement suggests that Government Integrity may be a more robust variable. Additionally, the significance level of Regulatory Efficiency, used in place of Regulatory Quality, also rose. A parallel observation can be made for the Rule of Law and Judicial Effectiveness variables. It can be observed that the aforementioned variables yield more consistent results compared to their counterparts in the World Governance Indicators.

When analyzing the model in which Liquidity serves as the dependent variable, it can be observed that the results diverge in several aspects from those shown in Table 2. Notably, the Freedom of Expression and Belief variable appears to be insignificant,

whereas Voice and Accountability, as featured in Table 2, was significant. This discrepancy underscores the fact that these two variables are not directly comparable. Additionally, another significant change concerns the Corruption Perception Index, which exhibits a higher significance level compared to the Control of Corruption variable. Despite these differences, the coefficients of the remaining variables, although altered, maintain parallelism with those documented in Table 2, in terms of coefficient signs and significance levels.

The analysis with Market Risk Sensitivity as the dependent variable indicates that the variable representing Freedom of Expression and Belief is not statistically significant. It is also evident here that this variable does not fully coincide with Voice and Accountability. Apart from this, the other variables reveal results similar to those of the variables in Table 2. Notably, variables associated with governmental functions and those pertaining to the rule of law demonstrate significant effects. And while there are variations in the coefficients, the levels of significance remain unchanged.

After running the model with alternative variables, it was observed that there were some changes between Tables 2 and 3, but the general structure remained unchanged. Two important points should be underlined in this section. Firstly, while Capital Adequacy and Asset Quality gave similar results to the Freedom of Expression and Belief variable, which was used in place of Voice and Accountability, they did not give similar results with the other components. Therefore, it can be said that the Freedom of Expression and Belief variable does not adequately represent the Voice and Accountability variable. Secondly, there is an important point regarding the independent variables related to corruption. Although the two variables seem to give similar results, the coefficient signs are diametrically opposite. This is because the two variables are calculated from different perspectives regarding corruption. Thus, it can be said that the two variables used regarding corruption give consistent results.

4. Conclusion

The banking industry's performance, which is one of the main components of the financial market, is vital for a well-functioning economy. Moreover, a healthy economic structure that can create conditions which will enable banks to perform better also contributes to the rapid development of the banking sector. From this point of view, it can be said that there is a strong relationship between the structure of the economy and the performance of banks.

Considering that improvements in bank performance will contribute positively to the economy, it is of great importance to measure banks' performance using the most comprehensive methods. There are many different methods for measuring bank performance. The CAMELS rating system, with its six dimensions obtained through different ratios, has come to the fore as the most comprehensive method and it is becoming increasingly widespread.

Bank management determines bank performance, but this performance is also affected by how well the economy is managed. Therefore, although there are many variables which can reflect the economic situation, the most effective and internationally accepted variable set is the WGI. The WGI comprise a data set consisting of six

components that measure institutional quality, and they help to show the status of a country's institutional structure.

This study investigates the potential relationship between bank performance and institutional quality, proxied by CAMELS and the WGI, respectively. According to the results, it can be seen that, based on the relevant model, institutional quality can have both positive and negative effects on bank performance. Although the negative relations are perceived as unexpected, considering the sample, it can be said that such results have emerged as the side effects of the trust that stems from improvements in economies. When examining the variables separately, it becomes evident that both the variables of Voice and Accountability, as well as Political Stability, do not exert any influence on Earnings. Notably, there is a significant relation between Government Effectiveness and the other CAMELS elements, with the exception of Liquidity. Government Effectiveness emerges as the most influential factor affecting the CAMELS components within this framework. Conversely, no discernible connection was identified between Asset Quality and Regulatory Quality, Rule of Law and Control of Corruption. Furthermore, Regulatory Quality and Rule of Law appear to have no impact on Management. Regarding sensitivity, it can be seen that neither the Regulatory Quality nor Control of Corruption variables yield any meaningful effects. Furthermore, according to the results, it is also striking that bank performance is affected by prior bank performance with a delay in all models, justifying the system GMM as an appropriate procedure in the empirical analyses.

In order to increase the reliability of the study, the possible relationship between the WGI and CAMELS variables was retested by finding alternative variables to replace the WGI variables. In the model where Capital Adequacy served as the dependent variable, alternative proxies for the WGI proved significant. Uniquely, the coefficients for Rule of Law and Judicial Effectiveness diverge substantially, indicating differences in measurement methodologies while affirming the model's robustness. The outcomes of the Asset Quality model are largely congruent with those presented in Table 2, while measures such as Regulatory Effectiveness and Judicial Effectiveness remain insignificant. Variations in coefficient values do not alter the fundamental structure of the model. In the Management Quality model, the insignificance of the Freedom of Expression and Belief variable underscores the limitations inherent in substituting it for Voice and Accountability. Excluding the Corruption Perception Index, whose significance increased to 5%, the significance levels of other variables align with those documented in Table 2. In the Earnings model, the enhanced significance levels of Government Integrity and Regulatory Efficiency suggest that these variables may offer more reliable results compared to their WGI counterpart. The Liquidity model indicates the insignificance of Freedom of Expression and Belief, contrasting with the significance of Voice and Accountability noted in Table 2, thereby emphasizing their lack of direct comparability. Moreover, an elevated significance in the Corruption Perception Index can be observed in the comparison with Table 2, with the other variables maintaining consistent coefficient signs and significance levels. Finally, in the model assessing Market Risk Sensitivity, the variable representing Freedom of Expression and Belief has no significant impact and fails to fully align with the Voice and Accountability measures. Nonetheless, other variables exhibit outcomes

akin to those in Table 2, with the Governmental Functions and Rule of Law variables continuing to show significance. Despite changes in coefficients, their significance levels remain unchanged.

Upon analysis with alternative variables, the overarching structure of Models 2 and 3 remained consistent, though some variations were noted. Two key observations merit emphasis. First, while the variables for Capital Adequacy and Asset Quality aligned with the results for Freedom of Expression and Belief, which was used as a proxy for Voice and Accountability, discrepancies arose with other model components, suggesting that Freedom of Expression and Belief does not fully encapsulate the dimensions of Voice and Accountability. Second, although similar outcomes were observed with the Corruption independent variable, the coefficients displayed opposing signs. This discrepancy arises from the distinct methodologies employed when assessing aspects of corruption, but it does show that, despite different analytical approaches, the results concerning corruption are generally consistent.

The results of this study have several implications regarding policy. First, the decision-makers of a country can determine how these quality variables can improve bank performance by assessing the quality of the institutional structure. Thus, a healthier economic structure can be achieved by enhancing bank performance. Bank performance is especially vital for emerging economies because of the dependencies on cash inflows and other trade activities. Second, investors outside a country can obtain information about the state of the financial markets in target countries by looking at the relationship between the quality of the institutional structure and bank performance. They can use this knowledge in their decision-making process on investment viability. It is also important for emerging economies to reach for financial resources through direct and portfolio investments. The knock-on effects of this can be seen from current-account deficit to employment.

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Appendix

Table A1 Ratios and Weights Used in Calculating CAMELS

Component of performance	Financial ratio	Weight (%)	Expected direction
Capital adequacy (%20)	Tier 1 Capital Adequacy Ratio	25%	+
	Capital Adequacy Ratio	25%	+
	Equity/Total Assets	25%	+
	Equity/Deposits and Short-term Funds	25%	+
Asset quality (%15)	Loan Loss Reserves/Total Loans	25%	-
	Loan Loss Reserves/Net Interest Income	15%	-
	Loan Loss Reserves/Non-performing Loans	20%	+
	Non-Performing Loans/Total Loans	25%	-
	(Non-PerformingLoans-Collections)/Average Loans	15%	-
Management quality (%15)	Non-interest Income/Average Assets	25%	+
	Non-interest Expenses/Average Assets	25%	-
	Extraordinary Income Before Tax/Average Assets	20%	+
	Total Expenses/Total Revenues	30%	-
Earnings (%15)	Net Interest Margin	25%	+
	Net Income/Average Assets	25%	+
	Return on Average Assets (ROAA)	25%	+
	Return on Average Equity (ROAE)	25%	+
Liquidity (%20)	Loans to Banks/Loans from Banks	20%	+
	Net Loans/Deposits and Short-term Funds	20%	-
	Liquid Assets/Deposits and Short-term Funds	30%	+
	Liquid Assets/(Deposits + Loans)	30%	+
Sensitivity to market risks (%15)	Deposits/Funds Except Derivative	25%	+
	Securities/Total Assets	25%	-
	Fair Value of Assets/Book Value of Assets	25%	+
	Non-Interest Revenues/Operating Revenues	25%	-

Source: Authors' compilation.