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Abstract

This paper investigates the role of the level and composition of government spending as a determinant of three different aspects of bank performance in 179 banks from the MENA region between 2001 and 2019. To control for the impact of the oil sector on the banking system of some countries in the region, we divide our sample into two groups of banks, depending on whether they are from net oil importers or net oil exporters. The results reflect the inherent heterogeneity of MENA region economies. We find that the determinants of banking performance differ according to the type of spending and the nature of the economy's reliance on oil. Overall, the results show that government spending affects bank performance and that, in most cases, this impact is significantly negative. We find that current spending has either an insignificant or a negative impact on the investment and leverage efficiency of banks in the MENA region. On the other hand, while capital spending negatively affects lending growth, it has a positive effect on the performance of banks in oil-importing countries. Our findings shed light on the role of the level and composition of government spending on bank performance. Fiscal policy in the MENA region is greatly affected by oil prices and can have unintended effects on the banking sector.

Keywords: Bank performance, government spending, oil prices, MENA.
JEL Classifications: E44; E62; G21; H50.

ملخص

تبحث هذه الدراسة دور مستوى الإنفاق الحكومي وتكوينه كمحدد لثلاثة جوانب مختلفة من أداء البنوك في 179 بنكًا داخل منطقة الشرق الأوسط وشمال إفريقيا (MENA) بين عامي 2001 و2019. ولتثبيت قيمة تأثير قطاع النفط على النظام المصرفي في بعض بلدان المنطقة، يتم تقسيم عينة الدراسة إلى مجموعتين من البنوك، اعتمادًا على ما إذا كانت مستورد صافي للنفط أو مصدر صافي للنفط. وتعكس النتائج عدم التجانس المتأصل في اقتصادات منطقة الشرق الأوسط وشمال إفريقيا. وتوصلت الدراسة إلى أن محددات الأداء المصرفي تختلف باختلاف نوع الإنفاق وطبيعة اعتماد الاقتصاد على النفط. تُظهر النتائج عامةً تأثير الإنفاق الحكومي على أداء البنوك، وتوضح أن هذا التأثير في معظم الحالات يكون شديد السلبية. كما تشير النتائج إلى أن الإنفاق الحالي إما يؤثر تأثيرًا غير ملحوظًا أو سلبيًا على الاستثمارات وكفاءة الرافعة المالية للبنوك في منطقة الشرق الأوسط وشمال إفريقيا. وعلى الرغم من أن الإنفاق الرأسمالي يؤثر سلبًا على نمو الإقراض، إلا أنه يؤثر تأثيرًا إيجابيًا على أداء البنوك في البلدان المستوردة للنفط. وتسلط نتائج الدراسة الضوء على دور مستوى الإنفاق الحكومي وتكوينه فيما يتعلق بأداء البنوك. تتأثر السياسة المالية في منطقة الشرق الأوسط وشمال إفريقيا تأثرًا كبيرًا بأسعار النفط ويمكن أن ينتج عنها تأثيرات غير متعمدة على القطاع المصرفي.

I. Introduction

The impact of government spending on the economy has always been a central question in economic theory. However, it seems that there is little interest in studying how government spending affects banking performance, especially in the Middle East and North Africa (MENA)[2] region. In fact, this region has its particularities. On the one hand, around half of the countries (Algeria and the GCC countries) are mainly dependent on oil revenues, where hydrocarbon accounts for roughly 50 percent of the region's GDP and the country benefits from significant liquidity during periods of high oil prices. On the other hand, the rest of the countries in the region are net oil importers, where any hike in oil price negatively affects government fiscal balances and economic growth, causing a squeeze in liquidity and credit. Hence, the net impact of government intervention on banking performance is still ambiguous.

To the best of our knowledge, there is no theoretical framework that directly ties government spending to bank performance. This gap in the literature is rarely addressed as the studies related to bank performance don't consider the importance of the role played by government intervention (Alshammari, 2020; Djalilov and Piesse, 2016). Thus, our paper aims to empirically investigate the role of government spending as a determinant of bank performance in the MENA region.

Taking this into consideration, the first part of our paper examines the impact of government spending on economic growth and analyzes bank performance determinants to uncover how macroeconomic conditions affect bank performance. This allows us to understand the relationship between government spending and bank performance by analyzing their interactions with economic growth. The data and methodology section presents our panel dataset and describes the econometric methodology used in our paper. The third section presents the analysis of the results. We conclude our paper with a discussion of the results and their policy implications for the MENA region.

II. A brief review of the literature

Although the impact of government intervention on the economy has always been a central question in economic theory, literature on how the government affects banking performance is scarce. This gap in the literature is rarely addressed, as studies on bank performance do not consider the importance of the role played by government intervention (Alshammari, 2020; Djalilov and Piesse, 2016). We argue that the relationship between government spending and bank performance can be understood intuitively by first establishing the link between government spending and economic growth and then extending this impact to bank performance by understanding how economic growth affects bank performance.

[2] Due to data constraints, the MENA group in this paper includes only 12 countries: Algeria, Bahrain, Egypt, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Tunisia, and the United Arab Emirates.

According to Keynesian theory, government spending boosts economic growth via two main channels. The first channel affects economic growth directly by increasing production and aggregate demand using expansionary fiscal policy (Nyasha and Odhiambo, 2019). According to Romer (1986), by having access to tax revenues, the government can support the economy's social optimum by subsidizing the holdings and the accumulation of capital, or by subsidizing it and taxing the other factors of production. The second channel affects growth indirectly by laying the groundwork for private investment. This is mainly done by reducing and managing conflicts between private and social interests, increasing productive investment, and directing economic growth toward the social optimum (Ram, 1986). Government capital spending can also facilitate private investment in countries with less developed markets by building the necessary infrastructure that allows private capital to be more productive (Ghali, 1999). On the other end of the argument, classical, neoclassical, and public choice theorists argue that government intervention is detrimental to economic growth (Nyasha and Odhiambo, 2019). This is mainly due to the well-known crowding-out effect (Ghali, 1999; Ram, 1986), as public participation in the economy reduces the available opportunities for private enterprises. Furthermore, laissez-faire economists view the government as an inefficient economic actor (Ghali, 1999; Landau, 1983). According to this point of view, government interventions like subsidy programs and public investments are inefficient, have a high opportunity cost, distort economic incentives, and lower the productivity of the economic system (Ram, 1986). A more elaborate explanation of the spending-growth nexus is that the relationship changes according to the degree of government intervention and the composition of its spending (Nyasha and Odhiambo, 2019). According to Barro (1990) and Friedman (1997), government spending plays an important role in promoting economic growth but only up to a certain "optimal" point. After this point, more government intervention hinders economic growth. This inverted U-shaped curve dynamic relationship between government spending and economic growth is argued to be a mixed result of the public goods effect and the law of decreasing marginal returns (Dobrescu, 2015). Furthermore, even productive spending could become unproductive if used in excess (Devarajan et al., 1996). According to Devarajan et al. (1996), it is the mix between productive and unproductive government spending, not its level, that has an impact on economic growth. Thus, studying the effect of government spending composition on growth can lead to more interesting results.

To settle the debate on the impact of government spending on economic growth, extensive empirical work has been conducted to measure the growth effect of government spending in developing countries (see, for instance, Asimakopoulos and Karavias, 2016; Bose et al., 2007; Butkiewicz and Yanikkaya, 2011; Devarajan et al., 1996; Ghosh and Gregoriou, 2008; Gupta et al., 2005; Kimaro et al., 2017; Landau, 1983; Olaoye et al., 2020; Wahab, 2011).[3] The consulted empirical literature yielded conflicting results. These results may be explained by differences in government structural policies, resource allocation efficiency, and the quality of its institutions.

[3] A breakdown of the consulted empirical literature on the growth effect of government spending is summarized in Appendix A.

The review of the theoretical and empirical literature on the impact of government spending on economic growth allows us to understand the different channels by which government intervention can improve or disturb macroeconomic conditions in developing countries. Thus, economic growth can be a channel through which government spending can affect the performance of the banking sector, which relies heavily on the health of aggregate demand. Consequently, understanding the effect of economic growth on bank performance allows us to consider economic growth as a mediating variable that links government spending to bank performance. Accordingly, reviewing the literature on the determinants of bank performance shows that a large part of the literature on bank performance distinguishes between the internal and external determinants of bank performance (Alshammari, 2020). Internal determinants are bank-specific factors that affect performance, while external factors are the exogenous macroeconomic conditions that affect the demand for financing and intermediation services as well as the bank's capacity to accumulate resources. It should be noted that some empirical examinations of bank performance focus only on the internal determinants (Abdul Hadi et al., 2018; Daly and Frikha, 2017; Owusu-Antwi et al., 2014; Sun et al., 2017), while others include external factors – mainly GDP (or another proxy of economic growth) – as a main external determinant of bank performance (Djalilov and Piesse, 2016; El Mahmah and Trabelsi, 2021; Grigorian and Manole, 2006; Jara-Bertin et al., 2014; Nouaili et al., 2015; Rashid and Jabeen, 2016; Sufian and Noor Mohamad, 2012).[4] Unsurprisingly, the majority of the consulted empirical literature supports a positive effect of economic growth (measured either by real GDP, GDP growth, or GDP per capita) on banking performance indicators (El Mahmah and Trabelsi, 2021; Grigorian and Manole, 2006; Jara-Bertin et al., 2014; Nouaili et al., 2015; Sufian and Noor Mohamad, 2012). This supports our hypothesis that government spending can affect bank performance through its effect on economic growth. Thus, according to intuition and most of the consulted empirical literature, economic growth is most likely to have a positive effect on bank performance. The profitability of banking activity relies heavily on good macroeconomic conditions to boost the demand for credit and other intermediation services. We can consider economic growth the main external driver of bank performance.

We can reasonably assume that the effect of government spending on economic growth and bank performance is the same. That is, by affecting economic growth, government spending indirectly affects bank performance. For instance, if we assume that spending has a positive growth effect and that economic growth boosts bank performance, then, by boosting economic growth, government spending also, indirectly, boosts bank performance. The same logic applies if we consider that government spending has a negative or nonlinear effect on economic growth. Accordingly, if we assume that economic growth positively affects bank performance, then government spending affects performance indirectly, in the same way that it affects economic growth.

To our knowledge, the only study that considers the relationship between government spending and bank performance as the main research objective was done by Alshammari (2020), who

[4] A breakdown of the consulted empirical literature on the determinants of bank performance is summarized in Appendix B.

investigated the spillover effect of government spending on bank performance in Kuwait. The author used standard panel techniques (pooled OLS, fixed effect, and random effect) to investigate the indirect effect of government spending on seven Kuwaiti commercial banks. He finds that massive government spending tends to crowd out the role of the private sector, thereby negatively affecting banks' performance. Few other studies considered government intervention as a determinant of bank performance. For instance, Djalilov and Piesse (2016) studied the determinants of bank profitability in 16 transition countries using a GMM panel model. The study's results suggest that government spending harms bank performance in late transition countries but does not affect early transition countries. In addition, Daly and Frikha (2017) explore the performance of 12 Bahraini banks using a Data Envelopment Analysis. The study uses two variables associated with government intervention (government effectiveness and regulatory quality) and shows that they both harm conventional banks' performance.

The observed lack of interest in the relationship between government spending and bank performance may be explained by the fact that it is only a spillover effect. In this sense, the relationship between government spending and bank performance is quite intuitive. Succinctly, government spending is argued to have a significant (positive or negative) effect on economic growth. This effect can extend to affect bank performance through a growth effect channel, as growth represents an increase in aggregate demand, including the demand for financing and other banking services, which, in turn, have a direct effect on banking performance. To illustrate this relationship, our review of the literature will be conducted in two phases. The first is a review of the literature on the impact of government spending on economic growth and the second is an analysis of bank performance determinants in the empirical literature.

III. Data and methodology

This section presents our approach to examining the relationship between government spending and bank performance in the MENA region. To this end, we describe the selected variables, according to data limitations and the intended objectives. Then, we specify the appropriate econometric model, which tackles all statistical problems, taking into consideration the specific characteristics of the MENA countries.

III.1. Data description

To test for the impact of government spending on bank performance, we employ both bank-level and country-level data. The dataset is based on banks' balance sheets sourced from Bureau van Dijk's BankFocus database as well as country-level variables sourced from various international institutions (IMF and World Bank) and national authorities (central banks and ministries of finance). The initial dataset covers banks from 12 MENA countries over the period 2002-19. After removing banks with a high number of missing data (more precisely, with more than 25 percent of the data missing), we removed the top and bottom one percent of observations for the dependent variable to reduce the outliers' effects. After adjustments, the final sample includes 179 banks over the period 2002-19, giving a total of around 3,300 observations per variable (see Table 1).

To explain the banks' performance, we selected three dependent variables: return on assets (ROA), return on equity (ROE), and lending growth (LNDG). The ROA and ROE are measured as the ratio of total operating return to average total assets and equity, respectively, while lending growth is the year-to-year difference in the log of total gross loans. The return on assets denotes the percent return on each dollar of assets and represents the bank's ability to manage and allocate its assets to generate profits, or, in other words, the performance of its investment policy (Jara-Bertin et al., 2014). On the other hand, the return on equity denotes the percent return on each dollar of equity and the performance of the bank financing policies (Sufian and Noor Mohamad, 2012). Finally, lending growth is analogous to the turnover of a non-financial company and arguably represents performance. It should be noted that while lending growth is not a precise indicator of performance, other indicators used in the literature also have their limitations. For instance, the ROA does not represent profits from off-balance activities, while the ROE neglects the risks and costs associated with leverage (Sufian and Noor Mohamad, 2012). Using three different indicators of bank performance is a way to account for these differences and the different ways in which bank- and country-specific factors affect various aspects of bank performance in the MENA region.

Regarding the main selected independent variables, the internal determinants include standard bank characteristics, which are the size (Size), liquidity (Liq), and capital adequacy (Cap). The three variables are measured as follows:

A bank size ($Size_{i,t}$) is the log of total assets $log\ A_{i,t}$ minus the average level for the bank over the study period.

$$Size_{i,t} = log\ A_{i,t} - \frac{1}{N_t}\sum_{i=1}^{N} log\ A_{i,t} \quad (1)$$

This bank size can be interpreted as a proxy for the degree of monopoly. The bigger the size of the bank compared to its competitors, the higher the degree of monopoly power (El Mahmah and Trabelsi, 2021). Ideally, larger banks have more internal resources and can access money and equity markets more easily. In contrast, in the presence of capital market imperfections, smaller banks have, comparatively, more difficulties accessing money markets (Kashyap and Stein, 1995). Therefore, it is reasonable to assume a positive relationship between the comparative size of a bank and its overall performance. However, Nouaili et al. (2015) show that the size of a bank negatively affects performance. The authors argue that this can be a result of the diseconomies of scale. Furthermore, according to existing literature, larger banks with aggressive growth strategies can reduce their interest margins to gain market share.

Capitalization ($Cap_{i,t}$) is given by the ratio of equity (E) to total assets, minus its average value for the bank over the study period.

$$Cap_{i,t} = \frac{E_{i,t}}{A_{i,t}} - \frac{1}{N_t}\sum_{i=1}^{N} \frac{E_{i,t}}{A_{i,t}} \quad (2)$$

By defining size and capitalization in this manner, we ensure that the internal factors capture pure differential effects. For each period, the variable averages to zero, being negative for banks with a specific characteristic (size and capitalization) that is below average (henceforth referred to as small or less capitalized banks) and positive for banks with a specific characteristic that is above average (henceforth referred to as large or well-capitalized banks). Furthermore, in the presence of asymmetric information, rising capital becomes costly for undercapitalized banks. Faced with such a situation, undercapitalized banks can only extend low-risk loans or reduce their credit supply altogether to meet the capital adequacy ratio (Watanabe, 2007). We expect well-capitalized banks to perform better.

Liquidity ($Liq_{i,t}$) is measured by the ratio of liquid assets (LA) to total assets minus the per-bank average over the study period.

$$Liq_{i,t} = \frac{LA_{i,t}}{A_{i,t}} - \frac{1}{T_i}\left(\sum_{t=1}^{T_i} \frac{LA_{i,t}}{A_{i,t}}\right) \quad (3)$$

The variable is supposed to measure each bank's perception of excess liquidity. The banks are supposed to have an internal evaluation of excess liquidity according to their balance sheet characteristics and risk perception. Thus, the variable measures each bank's estimated risk of not having sufficient liquidity to cope with the withdrawal of deposits and the insolvency risk. As liquidity management is supposed to be one of the banking sector's most important functions, we expect liquid banks to perform better. On the other hand, Abdul Hadi et al. (2018) argue that there is a positive opportunity cost for holding excess liquidity. In general, illiquid investment yields higher returns. Thus, banks that hold more excess liquidity can be less profitable.

As per the external determinants of bank performance, we include a set of key macroeconomic factors that reflect the specificities of MENA countries. In line with a parsimonious specification, we use three variables: real GDP growth, interest rate, and inflation. GDP growth (GDPG) is the year-to-year growth of real GDP and is expected to be positively related to bank performance, as a rise in economic activity indicates a higher aggregate demand for goods and services, including financing and financial intermediation. The inflation rate (INFL) is the year-to-year growth rate of the consumer price index. A rise in inflation could negatively harm aggregate demand by increasing uncertainty and the operating cost of firms (Jara-Bertin et al., 2014; Nouaili et al., 2015). However, Djalilov and Piesse (2016) argue that by anticipating its rise, banks can adjust their nominal interest rates to keep up with inflation and improve their profitability. Finally, the short-term lending interest (IR) rate is expected to be positively related to bank performance as it is positively related to earning on lending. However, excessively high interest rates could discourage credit demand and thus reduce bank performance.

Concerning the government intervention indicators, we use three measures of government spending (GTS for total spending, GCS for current spending, and GKS for capital spending)

expressed as ratios to GDP, to investigate the effect of the level and composition of government spending on bank performance. Given the importance of public expenditures in financing investment and consumption activities, we distinguish between current and capital expenditures to examine the effect of different channels through which government spending can contribute to bank performance. Finally, to check the robustness of our results, we include the oil price, given the importance of the oil sector in the banking system in some of the MENA countries. It is worth noting that the stationarity of the adopted variables was tested using the Augmented Dickey-Fuller test (ADF), which indicates that all the series selected in this model are stationary.[5]

To account for the fact that oil price shocks affect oil importers and exporters differently, we divide our sample into two subsamples. Table 1 presents the number of banks and observations, as well as some descriptive statistics, showing interesting results.

Table 1. Selected descriptive statistics of bank performance indicators in the MENA region

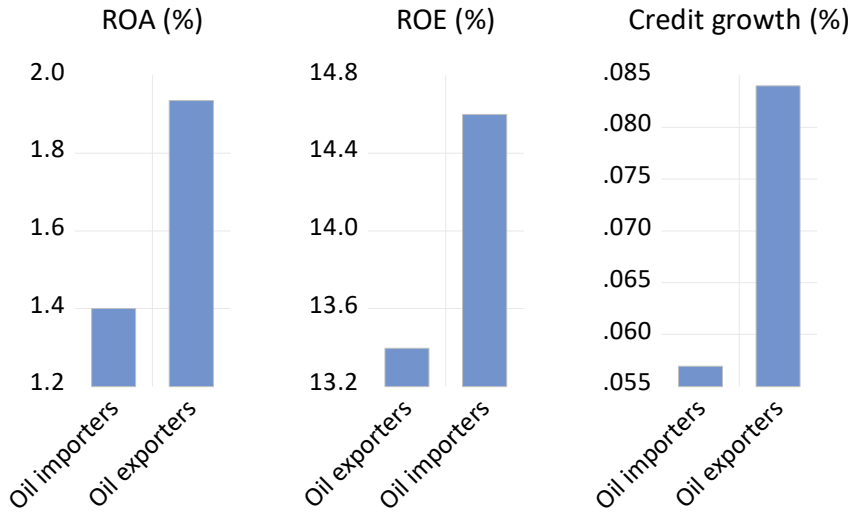
Country	Full sample			Oil exporters			Oil importers		
	ROA	**ROE**	**LNDG**	**ROA**	**ROE**	**LNDG**	**ROA**	**ROE**	**LNDG**
Total banks	179	179	179	88	88	88	91	91	91
observations	3315	3315	3142	1623	1623	1537	1692	1692	1605
Mean	1.83	14.49	0.10	2.06	13.49	0.11	1.60	15.50	0.08
Median	1.71	14.03	0.07	1.93	13.38	0.08	1.40	14.64	0.06
Min	-2.79	-21.42	-0.68	-3.22	-20.91	-0.87	-2.67	-23.43	-0.62
Max	7.50	61.83	0.97	7.55	44.55	1.13	7.42	67.00	0.70
Std. Dev.	1.36	10.37	0.18	1.38	8.72	0.21	1.31	11.90	0.17

III.2. Stylized facts

After describing all the collected data and the selected samples of counties, a brief statistical analysis is important to understand how bank performance differs from one group of countries to another in the MENA region.

[5] The results of the ADF test are not reported but are available from the authors upon request.

Figure 1. The differences in the median of bank performance indicators based on oil dependency



Source: The panel dataset used in this paper.

Figure 1 clearly shows the significant difference between banks' performance indicators in oil-exporting countries and oil-importing countries. This can be attributed to inherent differences in economic structure and the development of financial systems. In fact, given that economic activity in oil-exporting countries is reliant on oil prices, higher oil revenue boosts government spending, which leads to abundant liquidity in the banking system and strong confidence in the private sector. This results in higher deposits and credit in support of the growth of the non-oil sector and consequently improves banks' performance. On the other hand, any rise in oil prices puts pressure on net oil importers by causing a decline in government spending and slowing the growth of monetary aggregates, liquidity, deposits, and credit, which harm banks' performance in those countries.

For more details, Appendix C presents three panels that show some examples of the key differences in macroeconomic structure between the two subsamples of countries included in our study. During the study period, oil exporters experienced higher levels of economic growth, investment, and price stability (panel 1) compared to oil importers. Panel 2 highlights the difference in levels of government spending, as countries with abundant natural resources benefit from higher revenues. Finally, given the differing trends in terms of oil and fiscal balance dependency, as well as with different levels of economic and institutional development, Panel 3 shows that oil exporters are net lenders and have less government debt compared to oil importers.

Regarding banks' indicators, oil dependency can also have a lasting impact on the structure and performance of the banking sector. Comparing some banking development indicators for the two subsamples in Appendix D shows that the banking sectors in oil-importing countries are

larger and have access to more clients but are less capitalized and more exposed to systematic and diversifiable risk. These differences in both the macroeconomic environment and balance sheet constraints should make banks in the two subsamples exhibit measurable differences in investment strategies, asset management, and risk tolerance.

Based on these observations, we estimate a baseline model for the full sample before dividing it into two subgroups and measuring the effect of oil price changes on bank performance in each subsample.

III.2. Model specification and empirical methodology

For the empirical investigation, our baseline parsimonious specification can be generally written as follows:

$$Perf = f(IF, XF, GS) \quad (4)$$

Where *Perf* is the dependent variable representing bank performance. We use return on assets (ROA), return on equity (ROE), and lending growth (LNDG) as indicators of bank performance in this study.

IF is a vector of internal determinants of bank performance, which are the size (Size), liquidity (Liq), and capital adequacy (Cap). It should be noted that these characteristics are lagged by one period, given that the bank's characteristics are items of the bank balance sheet and, as such, banks base their decision-making on the state of their already established balance sheets. XF is a vector of external macroeconomic determinants of bank performance, and GS is the measure of government spending.

Based on the work of Abdul Hadi et al. (2018), Nouaili et al. (2015), and Sufian and Noor Mohamad (2012), we use the least square estimation method with either a fixed or random bank-specific effect. We base the choice of the type of bank-specific effect on the results of the Hausman test.

Thus, our static specification could be written as follow:

$$Perf_{ijt} = \beta_0 + \beta_1' IF_{itj-1} + \beta_2' XF_{ijt} + \beta_3 GS_{ijt} + \gamma_i + \varepsilon_{it} \quad (5)$$

Where $Perf$ is one of the bank performance indicators, $IF: \{Size; Cap; Liq\}$ is a vector of bank-specific internal determinants of bank performance, $XF: \{GDPG; INF; IR\}$ is a vector of country-specific external determinants of bank performance, GS is one of the measures of government spending, γ_{it} the unobserved bank-specific effect, and ε_{it} is the error term.

IV. Empirical results

Considering the structural differences between the ecosystems of the banking industries in oil-importing and oil-exporting countries, it is reasonable to assume that the banks in the two samples react differently to their macroeconomic environment and are thus affected by the regressors differently. Furthermore, we argue that each of the adopted indicators, namely the return on assets, the return on equity, and credit growth, measure different aspects of banking performance, which we will henceforth refer to as investment efficiency, leverage efficiency, and output intensity. We also argue that the three aspects of bank performance are not necessarily correlated. This can be illustrated by comparing the correlation coefficients between the independent variables across our two subsamples (see Appendix E). For instance, while the correlation between ROA and lending growth in the full sample is 0.12, its value is 0.24 for oil exporters and practically zero for oil importers.

To take these considerations into account, we rearrange our results in tables 2 through 4 to analyze the determinants of investment efficiency, leverage efficiency, and output intensity across our samples.

Table 2: The estimation results for the ROA models

	Full sample			Oil importers			Oil exporters		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
C	0.746	0.835	0.388	0.228	0.642	-0.764	1.186	1.308	1.360
	(0.00)	(0.00)	(0.02)	(0.47)	(0.02)	(0.01)	(0.00)	(0.00)	(0.00)
Size(-1)	-0.395	-0.395	-0.442	0.249	0.214	0.231	-0.173	-0.179	-0.183
	(0.00)	(0.00)	(0.00)	(0.03)	(0.06)	(0.04)	(0.00)	(0.01)	(0.00)
Liq(-1)	-0.316	-0.259	-0.299	-0.889	-0.844	-1.064	0.003	0.103	0.125
	(0.05)	(0.11)	(0.06)	(0.00)	(0.00)	(0.00)	(0.99)	(0.70)	(0.65)
Cap(-1)	2.204	2.324	2.309	4.681	4.613	4.752	1.495	1.581	1.582
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Gdpg	0.026	0.026	0.027	0.048	0.049	0.045	0.017	0.013	0.013
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.08)	(0.07)
Infr	0.041	0.043	0.042	0.067	0.066	0.058	0.036	0.047	0.047
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
ir	0.102	0.102	0.105	0.051	0.067	0.094	0.138	0.128	0.123
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
ΔBrent	-20.538	-20.872	-21.208	-20.615	-21.588	-26.706	0.441	0.498	0.498
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.11)	(0.07)	(0.06)
Gts	-0.007	-	-	0.002	-	-	0.004	-	-
	(0.11)			(0.81)			(0.56)		
Gcs	-	-0.012	-	-	-0.020	-	-	0.003	-
		(0.01)			(0.03)			(0.72)	
Gks	-	-	0.016	-	-	0.122	-	-	0.008
			(0.14)			(0.00)			(0.60)
R^2	0.18	0.18	0.18	0.20	0.20	0.21	0.14	0.15	0.15
Hausman	566.32	202.79	325.75	8.66	14.66	28.49	22.17	20.92	24.57
	(0.00)	(0.00)	(0.00)	(0.99)	(0.93)	(0.24)	(0.00)	(0.00)	(0.00)

Note: P-values are reported between parentheses. We report the within R-squared for fixed effect models and the overall R-squared for random effect models.

Table 3: The estimation results for the ROE models

	Full sample			Oil importers			Oil exporters		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
C	8.903	8.176	7.047	-5.708	-2.180	-9.334	15.771	15.076	9.134
	(0.00)	(0.00)	(0.00)	(0.04)	(0.39)	(0.00)	(0.00)	(0.00)	(0.00)
Size(-1)	-1.845	-1.894	-1.984	2.215	1.972	4.742	-0.578	-0.599	-0.608
	(0.00)	(0.00)	(0.00)	(0.11)	(0.15)	(0.00)	(0.18)	(0.19)	(0.19)
Liq(-1)	0.516	0.938	0.879	-1.464	-1.160	-2.810	5.336	7.155	7.034
	(0.64)	(0.32)	(0.42)	(0.29)	(0.40)	(0.04)	(0.00)	(0.00)	(0.00)
Cap(-1)	-10.707	-10.122	-10.452	-12.316	-12.822	-9.744	-8.846	-8.312	-8.031
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)
Gdpg	0.132	0.139	0.131	0.519	0.525	0.527	0.051	0.054	0.078
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.29)	(0.26)	(0.11)
Infr	0.366	0.368	0.366	0.527	0.535	0.476	0.128	0.134	0.156
	(0.00)	0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.06)	(0.06)	(0.03)
ir	0.525	0.536	0.533	0.700	0.725	1.117	0.547	0.507	0.786
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
ΔBrent	-116.147	-119.193	-116.148	-215.294	-211.971	-256.888	2.451	3.076	4.866
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.19)	(0.09)	(0.01)
Gts	-0.073	-	-	0.169	-	-	-0.153	-	-
	(0.04)			(0.03)			(0.00)		
Gcs	-	-0.067	-	-	0.056	-	-	-0.160	-
		(0.08)			(0.51)			(0.00)	
Gks	-	-	-0.108	-	-	0.847	-	-	-0.002
			(0.21)			(0.00)			(0.98)
R2	0.13	0.13	0.13	0.20	0.20	0.20	0.11	0.11	0.11
Hausman	50.26	52.2	62.68	66.04	77.18	-5.92	33.07	22.7	90.94
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(NA)	(0.00)	(0.00)	(0.00)

Note: P-values are reported between parentheses. We report the within R-squared for fixed effect models and the overall R-squared for random effect models

Table 2 presents the estimation results for the determinants of investment efficiency for the full sample (columns 1 to 3) as well as for oil importers (columns 4 to 6) and exporters (columns 7 to 9). The results show that the internal determinants play an important role in explaining ROA in the full sample. For instance, the size and liquidity variables have a negative significant impact on ROA, while capital has a positive impact. Accordingly, banks with higher levels of total and liquid assets perform comparatively better than smaller, illiquid banks. On the other hand, more capitalized banks perform better overall. These results show that banks in the MENA region do not efficiently leverage their size and liquid assets to generate profits.

The results of columns 4 to 9 show that the banks in our two subsamples are affected differently by their balance sheet constraints. On the one hand, the negative impact of bank size on performance is only valid in oil-exporting countries, as larger banks from oil-exporting countries do perform comparatively better. This may be because the banking sector is highly concentrated (the aggregate concentration rate is 80 percent in oil-exporting countries versus 60 percent in oil-importing countries). Thus, while banks in oil-importing countries are unable to mobilize their size in generating profits, the aggressive growth strategies of banks in the oil-exporting countries effectively reduce their interest margins and harm their investment strategy. On the other hand, the negative impact of bank liquidity is only significant in the case of oil-importing countries. Finally, the positive impact of bank capitalization is consistent across

subsamples. Banks in oil-importing countries hold comparatively more liquid, less risky, and less profitable assets and thus have lesser investment efficiency.

The impact of external determinants on the investment efficiency of banks in MENA is, as expected, positive. The ROA is positively affected by higher levels of economic growth, inflation, and short-run interest rates. Higher economic growth and inflation rates are conventionally positively associated with higher levels of aggregate demand, including the demand for credit and other intermediation services. The effect of interest rates is more straightforward as it is directly associated with higher interest margins and thus higher bank profits. These results are consistent across all nine specifications in Table 2.

As for the impact of government expenditure, the results show that spending only affects oil-importing countries and that this effect depends on the composition of government spending. While current spending has no significant effect on the ROA of banks in oil-importing countries, current and capital spending have the opposite effect on the investment efficiency in oil-importing countries. The estimates from specifications 2 and 5 show that current spending harms the ROA of banks in oil-importing countries. On the other hand, the result of specification 6 shows that capital spending has a positive effect on ROA in oil-importing countries. These results confirm the hypothesis that the composition of government spending plays an important role in determining how government intervention can affect the performance of the banking sector. Finally, the results show that oil prices have a significant but different impact on bank performance in the MENA region. As expected, oil price hikes negatively affect the performance of the banking sector in oil-importing countries. Unsurprisingly, this effect is positive for oil exporters. These results are in line with how oil price hikes are supposed to affect government spending, revenues, and aggregate demand according to the economy's reliance on oil.

Results from Table 3 show that the determinant of leverage efficiency indicates that the effect of the external determinant (including oil prices) on ROA and ROE is similar. However, while size harms ROE in the full sample, this effect is no longer significant after the sample separation. The results show that banks from oil-exporting countries benefit from higher levels of liquidity. The results from specification 5 support that capital spending has a positive effect on bank performance in oil-importing countries. Finally, in contrast to the results from Table 2, current spending has a negative significant effect on bank performance in oil-exporting countries.

Table 4: The estimation results for the LNDG models

	Full sample			Oil importers			Oil exporters		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
C	0.226	0.232	0.172	0.226	0.159	0.181	0.523	0.515	0.249
	(0.00)	(0.00)	(0.00)	(0.00)	(0.09)	(0.00)	(0.00)	(0.00)	(0.00)
Size(-1)	-0.102	-0.095	-0.102	-0.287	-0.282	-0.285	-0.104	-0.103	-0.103
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Liq(-1)	0.404	0.387	0.385	0.369	0.362	0.390	0.512	0.480	0.475
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Cap(-1)	0.380	0.418	0.414	0.474	0.483	0.472	0.252	0.296	0.312
	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.06)	(0.00)	(0.02)
Gdpg	0.004	0.004	0.004	0.012	0.012	0.013	-0.001	-0.002	-0.001
	(0.03)	(0.05)	(0.03)	(0.00)	(0.00)	(0.00)	(0.61)	(0.48)	(0.78)
Infr	0.007	0.007	0.007	0.005	0.005	0.003	0.009	0.011	0.012
	(0.00)	(0.00)	(0.00)	(0.19)	(0.06)	(0.19)	(0.02)	(0.00)	(0.00)
ir	-0.009	-0.009	-0.009	-0.008	-0.009	-0.009	-0.023	-0.025	-0.013
	(0.03)	(0.03)	(0.04)	(0.04)	(0.05)	(0.04)	(0.02)	(0.00)	(0.15)
ΔBrent	0.056	0.057	0.069	0.069	0.068	0.086	0.004	0.023	0.105
	(0.37)	(0.36)	(0.26)	(0.26)	(0.37)	(0.26)	(0.97)	(0.00)	(0.31)
Gts	-0.001	-	-	-0.003	-	-	-0.006	-	-
	(0.45)			(0.07)			(0.04)		
Gcs	-	-0.002	-	-	-0.001	-	-	-0.007	-
		(0.29)			(0. 70)			(0.00)	
Gks	-	-	0.001	-	-	-0.014	-	-	0.001
			(0.79)			(0.07)			(0.84)
R2	0.06	0.06	0.06	0.07	0.07	0.07	0.06	0.06	0.06
Hausman	81.20	78.62	79.19	41.96	36.64	34.04	51.5	50.01	44.85
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

Note: P-values are reported between parentheses. We report the within R-squared for fixed effect models and the overall R-squared for random effect models

Results in Table 4 show the determinants of banks' lending growth. Overall, government spending has a negative impact on lending growth in both subsamples. This detrimental effect goes through current spending in oil-exporting countries and capital spending in oil-importing countries, although the effect of capital spending on bank lending in oil-importing countries is only valid at the 10 percent significance level. The results also support the negative effect of size on bank performance. Larger banks in the MENA region tend to have lower levels of lending growth and, consequently, fewer revenues. Furthermore, we can say that while the demand for credit is mainly driven by economic growth in oil-importing countries, oil price hikes could play a more important role in oil-exporting countries. Our results also show that lending growth in the MENA region is positively affected by the liquidity and capital position of banks in both subsamples. As expected, the economic growth and inflation rate positively affect lending growth in both subsamples.

V. Conclusions

This paper investigates the role of government spending as a determinant of three aspects of bank performance in 179 banks from the MENA region between 2001 and 2019 using fixed and random effect estimation methods. To control for the impact of the oil sector on the banking systems of some countries in the region, we divide our sample into banks from oil-exporting and oil-importing countries.

The results reflect the heterogeneity of the MENA region economies. We find that the determinants of banking performance differ according to the type of government spending and the nature of the reliance of the economy on oil. Government spending impacts bank performance differently in each subsample as summarized in Table 5.

Table 5: Summary of the results

Perf	ROA			ROE			LNDG		
Sample	Full sample	Oil importers	Oil exporters	Full sample	Oil importers	Oil exporters	Full sample	Oil importers	Oil exporters
GTS	0	0	0	(-)	(+)	(-)	0	(-)	(-)
GCS	(-)	(-)	0	(-)	0	(-)	0	0	(-)
GKS	0	(+)	0	0	(+)	0	0	(-)	0
ΔBrent	(-)	(-)	(+)	(-)	(-)	(+)	0	0	0

Overall, the results reveal that government spending affects bank performance. In most cases, this impact is significantly negative. The results indicate that current spending has either an insignificant or negative impact on the investment and leverage efficiency of banks in the MENA region. On the other hand, while capital spending negatively affects lending growth, it has a positive effect on the performance of banks in oil-importing countries. Moreover, oil prices have a positive impact on bank performance for oil exporters but negatively affect bank performance in nations that rely on oil imports to satisfy their energy needs. These findings are explained by the role played by oil in each subsample. For oil exporters, oil is the main revenue for the government and is used to boost the private sector. A hike in oil prices increases spending and aggregate demand. However, for the net oil importers, a rising price is a significant burden on the budget balance of the government and puts a strain on aggregate demand and bank performance.

In summation, our analysis sheds light on the role of the level and composition of government spending on bank performance. Fiscal policy in the MENA region is greatly affected by oil prices and can have unintended effects on the banking sector. Our results show evidence of an impact of government spending composition on the banking sector performance in the MENA region. While this impact is not robust across the specification, the impact of government spending on bank performance in the MENA region could be nonlinear. Further inquiry is required to assess the channels by which the negative effect of spending on credit affects bank performance in oil-importing countries.

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Appendices

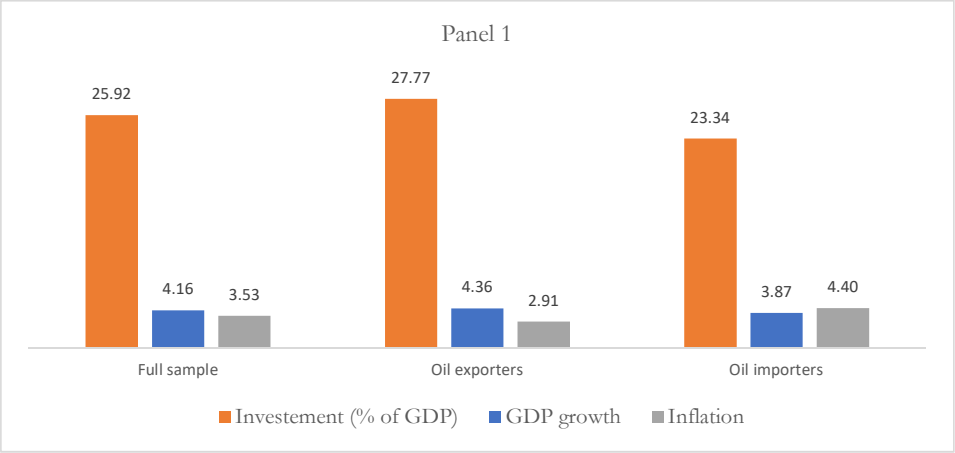
Appendix A: A summary of the consulted empirical literature on the growth effect on government spending

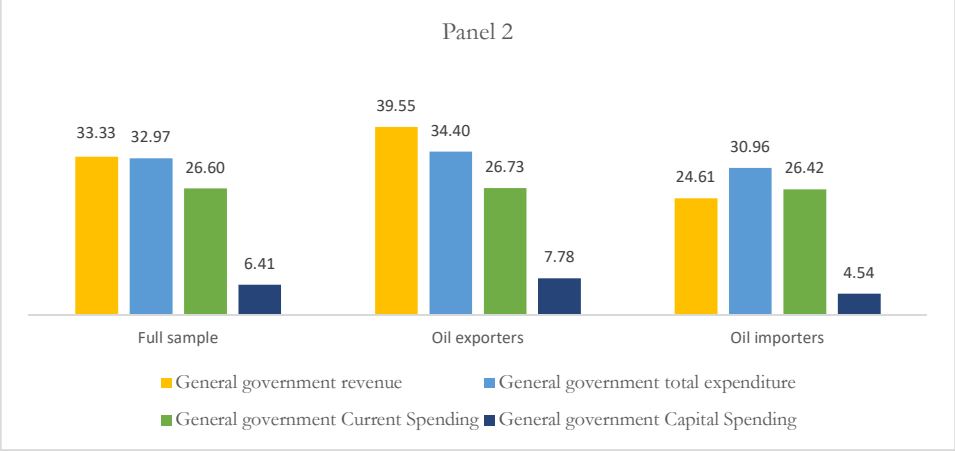
Study	Type of effect	Symmetry of effect	Results
Landau (1983)	Aggregated	Symmetric	Negative effect of current spending
Kimaro et al. (2017)	Aggregated	Symmetric	Positive effect of total spending
Asimakopoulos and Karavias (2016)	Aggregated	Asymmetric	Bell-shaped effect of total spending
Kim et al. (2018)	Aggregated	Asymmetric	Bell-shaped effect of total spending
Olaoye et al. (2020)	Aggregated	Asymmetric	Bell-shaped effect of total spending
Gupta et al. (2005)	Disaggregated	Symmetric	Negative effect of current spending Positive effect of capital spending
Butkiewicz and Yanikkaya (2011)	Disaggregated	Symmetric	Negative effect of total spending Negative effect of current spending Positive effect of capital spending
Bose et al. (2007)	Disaggregated	Symmetric	No effect of current spending Positive effect of capital spending
Devarajan et al. (1996)	Disaggregated	Symmetric	Positive effect of current spending Negative effect of capital spending
Ghosh and Gregoriou (2007)	Disaggregated	Symmetric	Positive effect of current spending Negative effect of capital spending
Wahab (2011)	Disaggregated	Asymmetric	Positive effect of total spending No effect of current spending Bell-shaped effect of capital spending

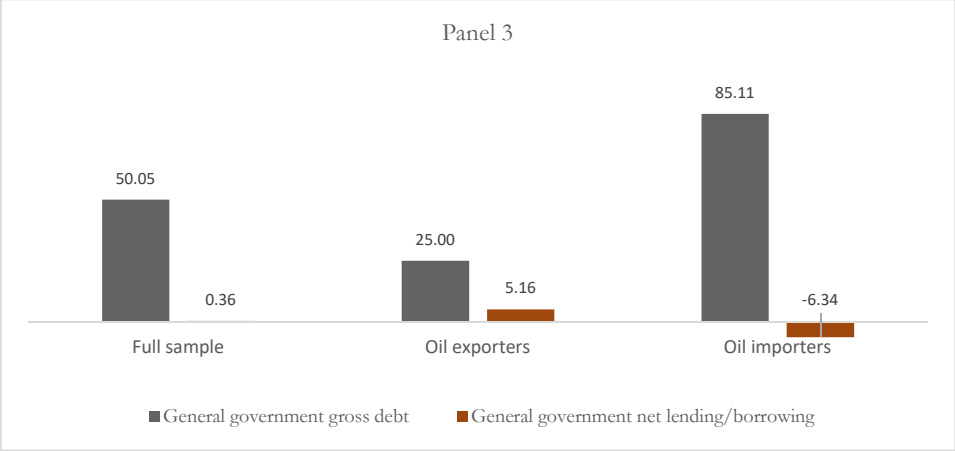
Appendix B: A summary of the consulted empirical literature on the determinants of bank performance

Study	Empirical methodology	The growth effect	The government intervention effect
Sufian and Noor Mohamad (2012)	Fixed effect model	Positive	NA
Nouaili et al. (2015)	Random effect model	Positive	NA
Abdul Hadi et al. (2018)	Random effect model	NA	NA
Alshammari (2020)	Ordinary least squares	Positive (investment)	Negative effect
Rashid and Jabeen (2016)	Generalized least squares	Negative	NA
Grigorian and Manole (2006)	Data Envelopment Analysis	Positive	NA
Daly and Frikha (2017)	Data Envelopment Analysis	NA	Negative effect (government effectiveness) Positive effect (regulatory quality)
Owusu-Antwi et al. (2014)	System GMM	NA	NA
Jara-Bertin et al. (2014)	System GMM	Positive	NA
Djalilov and Piesse (2016)	System GMM	No effect	Negative effect
Sun et al. (2017)	First difference GMM	NA	NA
El Mahmah and Trabelsi (2021)	System GMM	Positive	NA

Appendix C: Selected macroeconomic indicators according to the dependency on oil

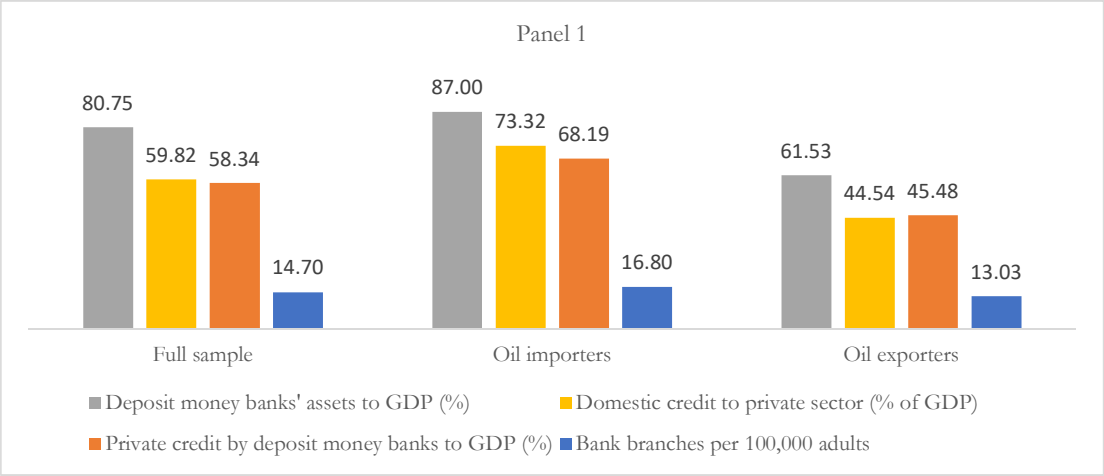


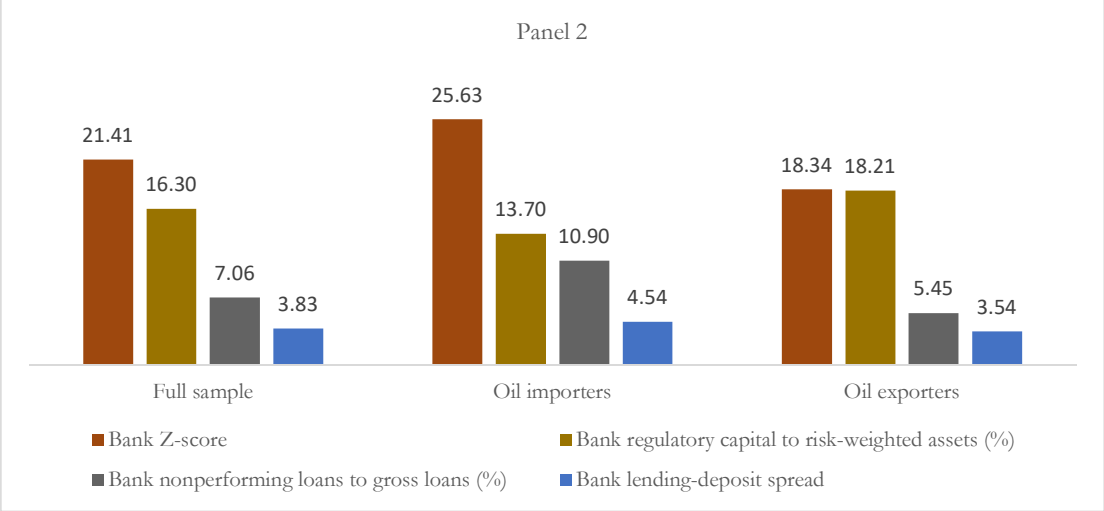




Source: Elaborated by the authors based on data obtained from national and international sources.
Note: All variables are calculated as ratios to GDP and are sample averages for the full study period.

Appendix D: Selected bank-specific indicators according to the dependency on oil





Source: Elaborated by the authors based on the World Bank's Global Financial Development database.
Note: All variables are calculated as sample averages for the full study period.

Appendix E1: The correlation matrix for the full sample

Correlation	*ROA*	*ROE*	*LENDG*	*SIZE*	*LIQ*	*CAP*	*GDPG*	*INFR*	*IR*	*GTS*	*GCS*	*GKS*	*BRENT*
ROA	1												
ROE	0.62	1											
LENDG	**0.12**	**0.12**	1										
SIZE	-0.10	0.07	-0.04	1									
LIQ	-0.13	-0.04	-0.01	-0.02	1								
CAP	0.27	-0.22	-0.05	-0.44	0.01	1							
GDPG	0.15	0.10	0.25	-0.08	0.10	-0.02	1						
INFR	0.22	0.30	0.11	-0.17	-0.04	0.01	0.18	1					
IR	0.05	0.22	0.02	-0.39	0.07	0.04	0.05	0.43	1				
GTS	-0.03	-0.07	-0.13	0.35	-0.04	0.01	-0.24	-0.09	-0.07	1			
GCS	-0.13	-0.07	-0.14	0.33	-0.04	0.01	-0.26	-0.06	0.05	0.80	1		
GKS	0.15	0.00*	0.02	0.04	0.00*	0.01	0.02	-0.04	-0.18	0.35	-0.29	1	
BRENT	0.06	0.05	0.07	0.11	-0.14	-0.07	-0.06	0.29	-0.24	0.06	0.09	-0.03	1

Note: * Negligent coefficient value. Not equal to zero.

Appendix E2: The correlation matrix for oil exporters

Correlation	*ROA*	*ROE*	*LENDG*	*SIZE*	*LIQ*	*CAP*	*GDPG*	*INFR*	*IR*	*GTS*	*GCS*	*GKS*	*BRENT*
ROA	1												
ROE	0.62	1											
LENDG	**0.24**	**0.24**	1										
SIZE	-0.27	0.06	-0.13	1									
LIQ	-0.08	-0.04	-0.08	-0.04	1								
CAP	0.28	-0.28	-0.06	-0.47	0.06	1							
GDPG	0.17	0.15	0.23	-0.18	0.05	-0.01	1						
INFR	0.22	0.16	0.26	-0.20	-0.02	0.04	0.26	1					
IR	0.17	0.11	0.17	-0.28	0.14	0.00*	0.15	0.30	1				
GTS	-0.14	-0.16	-0.23	0.37	-0.07	0.03	-0.40	-0.18	-0.10	1			
GCS	-0.19	-0.22	-0.24	0.53	-0.04	-0.01	-0.36	-0.26	-0.33	0.84	1		
GKS	0.08	0.09	-0.02	-0.24	-0.06	0.062	-0.10	0.11	0.37	0.36	-0.21	1	
BRENT	0.04	0.00*	0.04	0.18	-0.10	-0.08	-0.09	0.17	-0.22	0.10	0.07	0.05	1

Note: * Negligent coefficient value. Not equal to zero.

Appendix E3: The correlation matrix for oil importers

Correlation	*ROA*	*ROE*	*LENDG*	*SIZE*	*LIQ*	*CAP*	*GDPG*	*INFR*	*IR*	*GTS*	*GCS*	*GKS*	*BRENT*
ROA	1												
ROE	0.67	1											
LENDG	**0.00***	**0.04**	1										
SIZE	-0.05	0.30	0.01	1									
LIQ	-0.15	-0.04	0.05	0.1	1								
CAP	0.34	-0.21	-0.06	-0.47	-0.03	1							
GDPG	0.10	0.10	0.26	-0.01	0.19	-0.02	1						
INFR	0.32	0.6	0.06	0.00*	-0.06	-0.05	0.19	1					
IR	0.18	0.27	-0.00*	-0.14	0.01	0.02	0.12	0.45	1				
GTS	0.06	0.10	0.05	-0.15	0.08	0.01	0.18	0.1	0.38	1			
GCS	-0.01	0.11	0.06	-0.16	-0.03	0.01	0.04	0.1	0.49	0.83	1		
GKS	0.10	-0.04	-0.03	0.06	0.18	-0.09	0.20	-0.023	-0.31	-0.01	-0.57	1	
BRENT	0.09	0.08	0.10	0.05	-0.19	-0.05	-0.01	0.27	-0.35	0.02	0.12	-0.18	1