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Coping with Falling Oil Prices: The Different Fortunes of African Banks

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Abstract

This paper studies the impact of declining oil prices on banks in sub-Saharan African oil-exporting countries. Results indicate that banks respond differently to an oil shock depending on their ownership: (i) domestic banks are the most adversely impacted and experience a deterioration in asset quality and liquidity; (ii) foreign-owned banks are the most resilient as they are able to improve asset quality and attract deposits but at the same time, they decelerate credit growth; in contrast, (iii) Pan-African Banks help stabilize overall credit but large banks in that segment experience reduced asset quality. These differentiated results suggest a tradeoff between maintaining credit growth and safeguarding financial stability in an oil slump which could be addressed by both micro- and macroprudential policies.

JEL Classification Numbers: F62, F65, F68, G21.

Keywords: Oil price, non-performing loans, credit growth, deposit growth, bank ownership, bank characteristics, domestic banks, foreign-owned banks, Pan-African banks, sub-Saharan Africa.

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I. INTRODUCTION

An oil price boom-and-bust cycle can have significant consequences for the economies of oil-exporting countries, and particularly for those in sub-Saharan Africa. As noted in World Bank (2018), the 2014–16 collapse in oil prices was one of the three largest declines since World War II and the longest lasting since the 1986 slump. Sub-Saharan African oil exporting countries (Angola, Cameroon, Chad, Congo Republic, Equatorial Guinea, Gabon, Nigeria, and South Sudan) experienced a negative GDP growth in 2016 of -2.2 percent and many sought assistance from the IMF. The 70 percent oil price decline placed a particularly heavy burden on the banking sector of these African oil exporters. Banking systems' financial soundness indicators deteriorated markedly during the price decline as bank credit and deposit growth as well as bank profitability and liquidity fell.

Empirical studies have mostly focused on the impact of commodity price shocks on banks in commodity-exporting countries and on the importance of macro-financial linkages in amplifying such shocks over the financial cycle. For instance, oil price downturns typically lead to lower oil revenues and weaker fiscal and external positions and the correlated government spending can negatively impact asset prices and credit volumes. Developments in the latter can lead to a build-up of systemic vulnerabilities in the financial sector. Equity markets returns can fall as investors anticipate the impact of lower oil prices on the corporate sector, and generally weaker government spending growth. In turn, weak government spending leads to lower non-oil output growth, lower banking sector liquidity and credit growth and weaker bank balance sheets. The unravelling of systemic financial sector vulnerabilities could also have significant adverse effects on the real economy.

Focusing on macro-financial linkages in the Gulf Cooperation Council (GCC) countries, Khandelwal, Miyajima, and Santos (2016) find evidence of feedback loops between oil price movements, bank balance sheets, and asset prices and infer that bank capital and provisioning behave countercyclically through the cycle. Focusing on Saudi Arabia, Miyajima (2016; 2017) finds that lower oil price growth and non-oil private sector output lead to slower credit and deposit growth and higher NPLs, with feedback loops within bank balance sheets which in turn, dampen economic activity.

Kinda, Mlachila and Ouedraogo (2016) use a broader sample of 71 commodity exporters to find that, at the country level, negative commodity price shocks lead to higher NPLs, bank costs, and banking crises, and reduce bank profits, liquidity, and provisions to NPLs. These effects tend to occur in countries with low governance, weak fiscal space, no macroprudential policies, and a non-diversified export base.

Focusing solely on oil price booms, Beck and Poelhekke (2017) find that the financial system plays a limited role in absorbing windfall gains, especially in countries with less conducive institutional frameworks and repressed financial systems. Windfalls are measured as the changes in natural resource revenues due to exogenous world price shocks. They find that government consumption increases but not private credit. The smaller role of the financial sector in intermediating the resource boom may be a reason why the quality of investment decisions decreases and may help to explain why natural resource rents tend to be associated with slow growth.

Most studies focus on the impact of oil price declines on the overall banking system and only a few assess the role bank characteristics play in the transmission of negative oil price shocks. Agarwal, Duttagupta, and Presbitero (2018) focus on the transmission of changes in international commodity prices to domestic bank lending in developing countries. They find evidence of the importance of a credit supply channel as banks with lower deposits and poor asset quality transmit commodity prices changes to lending more aggressively. Interestingly, they find no significant difference in the behavior of foreign-owned and domestic banks in the transmission process. In contrast, in a literature review, which excludes African countries, Cull, Martinez Peria, and Verrier (2017) note that foreign-owned banks help stabilize credit when host countries face idiosyncratic shocks but can transmit external shocks and might not always expand access to credit.

This paper extends the literature by assessing the role of bank ownership and other characteristics in the transmission of the oil price downturn into the financial system of sub-Saharan African oil exporters. We focus particularly on the behavior of foreign-owned banks, Pan-African Banks (PABs), and domestic banks following an oil price shock. To our knowledge, this is the first paper to study the relative behavior of PABs in response to an oil price shock. In addition to bank ownership, we also consider other characteristics such as size, asset quality, liquidity, and business model.

Bank ownership and other characteristics may be relevant in understanding the response of African banks to an oil shock. For instance, compared to domestic banks, foreign-owned banks may have access to liquidity support from their headquarters while Pan African Banks (PABs)—African-owned banks with operations across the continent—may be able to diversify risks more. Larger banks may have a pricing advantage relative to smaller ones that could be used to absorb shocks. Banks with high asset quality in the form of low non-performing loans (NPLs) and high capital levels may have adequate buffers against shocks.

Using panel data estimations over the oil down cycle ending in 2016 for all major oil exporters in sub-Saharan Africa (except South Sudan), we find that bank ownership plays a significant role in transmitting oil price shocks in African countries.

Foreign banks behave more conservatively than other banks as they reduce credit and improve both their asset quality and liquidity positions as oil prices fall. PABs help stabilize overall credit following the same shock but while small PABs improve their asset quality, largest PABs experience a deterioration in their asset quality following a negative oil shock. Finally, domestic banks appear to bear the brunt of oil price declines as both their asset quality and their deposits decline.

Given the differentiated response of banks, our results suggest that both micro- and macroprudential policy can play a significant role in helping mitigate the impact of an oil price shock on the banking system of oil-exporting countries.

The rest of the paper is as follows: Section 2 presents stylized facts and Section 3 outlines the methodology and data while Section 4 presents the paper's main results. The last section concludes the paper.

II. STYLIZED FACTS

Banking systems in African oil-exporting countries experienced significant adverse effects in the aftermath of the oil down cycle during 2013-2016 relative to the oil up cycle during 2009-2012. Credit growth fell in all countries and particularly in Angola, Cameroon and Chad which experienced a significant decline. At the same time, asset quality deteriorated, reflecting higher NPL ratios, and liquidity positions deteriorated as deposits growth and the ratio of loans-to-customer deposits fell (although to a lesser extent in Angola). Bank profitability, measured by the return on average equity, and capital adequacy, proxied by the leverage ratio (equity-to-assets), also fell. Appendix 1 provides stylized facts on the effects of the oil price decline on financial soundness indicators across countries.[2]

The impact of the oil price decline appears to be differentiated across banks with distinct characteristics. Appendix 2 shows differences across Pan African banks (PABs), foreign-owned and domestic banks,[3] as well as large and small banks.[4] It also shows the differences between banks with high and low NPL ratios, our measure of asset quality.[5]

[2]Due to data availability, the oil price decline period for Chad is 2013-2014, however, it is 2013 in averaging bank NPL ratios. The period in which oil prices increased in averaging total equity as a ratio of total assets is 2010 - 2012 for Gabon.

[3] The list of Pan-African banks is taken from the Pan-African Banks Opportunities and Challenges for Cross-Border Oversight (Enoch et al., 2015). Subsidiaries of Pan-African banks, in which Pan-African Banks have a majority shareholding, are taken as Pan-African Banks. Foreign and domestic banks are categorized as per the location of the majority shareholder and/ or the ultimate parent as described by Fitch Connect.

[4] Large Banks are taken as the top 25 percent of banks with the highest total bank assets for each year whilst small banks represent the bottom 25 percent of banks with the lowest total bank assets for each year.

[5] Banks with high NPLs are taken as the top 25 percent of banks with the highest NPL ratios for each year whilst banks with low NPLs are the bottom 25 percent of banks with the lowest NPL ratios for each year.

Foreign-owned banks were resilient during the oil price decline as indicated by their increased profitability, asset and deposit growth, and decreased NPL ratios. To a lesser extent, Pan-African and large banks also demonstrated resilience during the oil price decline. Although their asset growth declined during the oil bust, such banks did not experience a significant fall in their financial soundness indicators.

In contrast to foreign-owned banks and PABs, domestic banks and banks with low asset quality (high NPLs) experienced a deterioration of their asset quality during the oil price decline. Deposit growth of domestic banks and banks with high NPLs also fell. All types of banks except those with low asset quality (high NPLs) increased their capital buffers (measured by the ratio of equity-to-total assets) during the oil bust period.

Generally, banks with high asset quality appear to be the most resilient to an oil price shock. Apart from a moderate decrease in their profitability, these banks saw an increase in total assets, total deposits, credit growth, liquidity, and capital buffers. Moreover, these banks saw a minimal change in their NPL ratio.[6]

Overall, it appears that foreign-owned banks, banks with high asset quality (low NPL ratios), and to a lesser extent PABs and large banks, are more resilient to an oil price shock. These results suggest that having strong buffers before the oil shock (such as low NPL ratios), having the ability to diversify risk during a shock (PABs and large banks) and the ability to gain access to external liquidity from a parent bank during a shock (foreign-owned banks) may all be buffers against the oil price shock. The stylized facts also suggest that bank characteristics, including their business models, may play a role in the differentiated response of banking systems to a transmission of oil shocks. In the next sections, we empirically test whether this is the case using bank-by-bank data and controlling for macroeconomic variables.

III. METHODOLOGY AND DATA

We use a dynamic panel model to assess the impact of declining oil prices on bank level credit growth, NPLs, and deposit growth as in Agarwal et al. (2018); Beck & Poelhekke (2017), Khandelwal et al. (2016), Kinda et al. (2016), and Miyajima (2016, 2017). We also use the first lag of the dependent variable as an independent variable in the model and a logit transformation for the NPL ratio to ensure it is normally distributed. We model an oil price shock following Arezki and Bruckner (2010) and Bruckner and Ciccone (2010) as:

$$Oil\ Price\ Growth_{\ c,t} = \theta_c\, \Delta \log(Oil\ Price_t) \qquad (1)$$

where $Oil\ Price_t$ is the international price of Brent Crude oil in year t and θ_c is the time-invariant average value of oil exports in the total export basket of country c. Kinda et al. (2016)

[6] This specific result should be treated with care as the high NPL and low NPL measures are correlated with the NPL ratio (given that they are dummy variables of the NPL ratio).

argue that the above measure of the price shock does not account for a potential trend related to changes in price and thus would result in a nonstationary price index. However, as this paper focuses on sub-Saharan African oil-exporting countries, the weight θ_c barely changes over time. Moreover, since we use the first difference, we ensure that the $Oil\ Price\ Growth\ _{c,t}$ index is stationary.

The determinants of the banking sector are modelled using a dynamic panel estimation for bank i in year t as follows:

$$y_{it} = \alpha_0 + \alpha_1 y_{i,t-1} + \alpha_2\left(D_{i,t-1} * Oil\ Price\ Growth_{c,t-1}\right) + \sum_j \alpha_{3j} Macro_{j,t-1} + \sum_k \alpha_{4k} Bank_{i,k,t-1} + \tau_t + \vartheta_i + \mu_{it} \quad (2)$$

where y_{it} represents either the logarithmic change in gross loans (credit growth), the logit transformation of the ratio of total impaired loans to gross loans (NPL ratio), or logarithmic change in total deposits (deposit growth). As the financial sector may be subject to innovation and shocks, we include a lagged dependent variable($y_{i,t-1}$). $D_{i,t-1}$ is a dummy variable indicating the bank characteristics at time $t-1$, that captures high vs. low size, asset quality (NPL ratio), liquidity, leverage (capital buffer), profitability, and ownership or business model (domestic, foreign-owned or Pan-African bank). τ_t are year dummy variables that help control for potential time effects not directly related to the change in oil prices, ϑ_i are bank fixed effects, μ_{it} is the error term, i denotes bank level variants and t denotes the year.

$Macro_{j,t-1}$ and $Bank_{i,k,t-1}$ capture a range of macro level and bank level control variables, respectively. Our selection of these variables is comparable to the literature. In particular; $Macro_{j,t-1}$ includes $Oil\ Price\ Growth\ _{c,t}$, the log change non-oil GDP, the exchange rate, the inflation rate, and the ratio of private credit-to-GDP. $Bank_{i,k,t-1}$ represents bank level variables including credit growth or deposit growth, other interest income, the ratio of net loans-to-total assets, the logarithm of total assets, and holdings of government securities.[7] Appendix 3 explains all variables, provides descriptive statistics, and data sources while Appendix 4 provides a list of the banks in the sample.

Our variables of interest are $D_{i,t-1} * Oil\ Price\ Growth_{c,t-1}$ and $Oil\ Price\ Growth\ _{c,t}$ and thus we pay attention to the respective coefficients. As we are interested in the impact of declining oil prices, we multiply each coefficient by -1 to determine the relationship as oil prices decrease. That is, we interpret each coefficient as a 1 percent decrease (after multiplying it by -1) in the change in oil prices and assess its impact on the banking sector.

To determine the impact of the oil price shock on the banking sector, we use data over the oil down cycle ending in 2016, for a cross-section of all major oil exporters in sub-Saharan Africa

[7]Credit growth is used as a bank level control variable when assessing the impact on deposit growth. Deposit growth is used as a bank level control variable when assessing the impact on credit growth and the logit of banks NPL ratio. We take the change in the natural logarithm of the holding of government securities.

(except South Sudan which obtained independence only in 2011): Angola, Cameroon, Chad, Congo Republic, Equatorial Guinea, Gabon, and Nigeria. Over the 2009-2016 period, we identify a 4-year up cycle during which oil prices had been increasing (2009-2012) and a 4-year down cycle when oil prices were decreasing (2013-2016). Bank level data are from Fitch Connect while macro data are from the IMF World Economic Outlook, IMF Primary Commodity Prices, and IMF International Financial Statistics.[15]

IV. RESULTS

A. Differentiated impact of the oil price shock

Credit Growth

Table 1A presents the estimated impact on credit growth of bank characteristics such as bank size, asset quality, liquidity, leverage, profitability, and type of bank ownership/business model on the independent variables. Foreign-owned banks and banks with low capital buffers (leverage ratio) appear to be more conservative during the period in which oil prices decline as they reduce credit growth. In contrast, large banks increase credit growth following a decrease in oil price growth.

Several bank characteristics have no statistical impact on credit growth when oil prices growth decreases. However, the type of bank ownership may coincide with bank characteristics. For instance, a PAB may coincide with a small bank or a bank with high NPLs. We take a closer look at the various bank characteristics in Table 1B by assessing the impact of mutually exclusive groups of characteristics.

We find again evidence that foreign-owned banks behave more conservatively (although we can only make this conclusion once we consider the impact of oil price growth on foreign-owned bank's NPL and deposit growth) during oil busts as small foreign-owned banks, foreign-owned banks with both low and high NPLs decrease credit growth during the period of oil price decline.

In contrast, there is some evidence that PABs behave differently during an oil bust as large PABs, as well as PABs with low NPLs increase credit growth following a decrease in oil price growth. Finally, private domestic banks increase credit growth relative to publicly owned domestic banks as oil price growth declines. However, this result should be interpreted with caution as public domestic banks dominate our sample.

Asset Quality (NPLs)

Tables 2A and 2B show the estimation results with NPL growth as a dependent variable. In periods of falling oil prices, foreign-owned banks manage to improve their asset quality as their NPL ratios improve while large banks experience a deterioration in their asset quality. Coupled with the decrease in credit growth mentioned earlier, foreign-owned banks (once again) appear to be relatively more conservative than other types of banks.

Interestingly, the evidence for PABs is mixed as small PABs improve their asset quality (decreased NPL growth) while large PABs experience a deterioration in asset quality (increased NPL growth) as the price of oil falls (Table 1B). This result suggests that although PABs manage to maintain or even credit growth during an oil bust, this could come at the cost of higher NPLs for the large ones. In contrast, small PABs would be more conservative and manage to improve their asset quality (like foreign-owned banks). Lastly, even domestic banks with high asset quality experience higher NPLs as oil prices fall.

Deposit Growth

Our results indicate that foreign-owned banks are resilient as they can increase funding in the aftermath of a negative oil price shock (Tables 3A and 3B). The result is the same irrespective of foreign-owned banks' size or asset quality. Foreign-owned banks may receive funding from their parent banks during a downturn and may benefit from positive reputational effect. In contrast, our results indicate that deposit growth falls for domestic banks, whether small or large, following an oil price decline.

In sum, our findings suggest that foreign-owned banks are more conservative than other banks as they decrease lending and NPL growth but increase funding following an oil price decline. Our results also suggest that while PABs could be a stabilizing factor in the economy during an oil price bust (as they increase credit growth), they could increase systemic risk depending on the impact on the quality of their assets. Finally, domestic banks may be the most adversely impacted by declining oil prices as they increase NPLs and decrease funding. However, our results on domestic banks may be driven by the substantial number of domestic publicly-owned banks compared to domestic privately-owned banks in our sample. The next section present robustness tests.

B. Robustness Tests

As a robustness test we estimate the impact of the oil price shock in equation (2) using a system GMM approach. Unlike the results presented in tables 3 to 5 the system GMM uses both current and past information on banking systems, specifically credit, NPL, and deposit growth.

Table 4-6 provide the determinants of credit, NPL, and deposit growth using system GMM empirical specification. The previous result that foreign-owned banks are relatively conservative compared to other types of banks appear to be particularly robust. Foreign-owned banks reduce both credit and NPL growth while increasing deposit growth in periods of oil price declines, as seen in Tables 4-6. In contrast, PABs reduce asset quality (Table 5), however, the impact on credit growth could be positive or negative depending on the type of PABs. Generally, as seen in Tables 4 and 5, a larger size helps bank sustain their credit growth in the aftermath of the oil price shock but at the cost of lower asset quality (higher NPL growth). Small banks reduce credit growth (Table 4) at the expense of increasing NPL growth (Table 5). Finally, banks with high liquidity increase their deposit base during an oil price downfall.

C. Government Securities

Finally, we assess the impact of the oil price decline on the level of government securities held by banks. We explore the extent to which banks with distinct characteristics increase their holdings of government securities when oil prices are falling (Table 7). To that end, we control for bank-level deposits, as well as all other macro and bank controls used throughout.

There is mixed evidence that reduced oil price growth leads to larger government securities holdings by banks (Table 7). While domestic banks and banks with low capital buffers increase their holdings of government securities, PABs reduce their portfolios of government securities. Moreover, although statistically insignificant, foreign-owned banks also decrease their holdings of government. Since our sample of domestic banks is dominated by publicly owned banks, these results could be attributed to an increased reliance by governments on such banks for their placement of government securities as their financing requirements increase when oil prices fall.

V. CONCLUSIONS

The paper studies whether bank ownership and other characteristics play a role in transmitting the impact of the oil price shock on the largest oil-exporting African countries (except South Sudan). In so doing, the paper is, to our knowledge, the first to focus on the possible differentiated response of Pan-African Banks (PABs) to falling oil prices compared to foreign-owned banks and domestic banks.

We find that banks adjust differently to falling oil prices, depending on their characteristics. Foreign-owned banks have a conservative business model: when oil prices fall, they decrease lending, improve their asset quality, and increase deposit funding. In contrast, in the same period, PABs increase lending and decrease their holdings of government securities. However, the average impact of falling oil prices on their asset quality is unclear; on the one hand small PABs improve their asset quality while on the other hand large PABs experience a deterioration in asset quality.

The benefits of PABs extending more credit during a period of oil price decline could therefore be eroded by the decline in asset quality of the large banks in their segment. Finally, domestic banks are the most adversely impacted banks when oil prices decline. As their NPLs increase and their deposit funding falls, they are left with the burden of meeting the increased government financing needs. Large banks show some signs of resilience as they increase lending but at the cost increased NPLs. Lastly, banks with low capital buffers adjust to the falling oil prices by decreasing credit, increasing funding and their holdings of government securities.

The differences in banks' response to the declining oil prices suggest a tradeoff between maintaining credit growth and safeguarding financial stability in an oil slump. As a result, both micro- and macroprudential policies may play a useful role in mitigating the impact of falling oil prices on the banking systems of oil-exporting countries in sub-Saharan Africa. Our results also indicate that there may be merit in studying further the business model of pan-African banks as they appear to behave differently from foreign-owned banks.

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Table 1A: Determinants of Credit Growth

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Oil Price growth (t -1)	-0.519*	-0.962***	-0.776***	-0.571**	-0.949***	-0.670**	-0.778**	-0.656**
	(0.309)	(0.194)	(0.282)	(0.278)	(0.244)	(0.305)	(0.296)	(0.310)
Small Bank * Oil price growth (t -1)	0.0538							
	(0.192)							
Large Bank * Oil price growth (t -1)	-0.225**							
	(0.0995)							
Low NPL * Oil price growth (t -1)		-0.0573						
		(0.139)						
High NPL * Oil price growth (t -1)		0.00435						
		(0.0960)						
Low Liquidity * Oil price growth (t -1)			-0.0215					
			(0.112)					
High Liquidity * Oil price growth (t -1)			0.176					
			(0.128)					
Low Leverage * Oil price growth (t -1)				0.342**				
				(0.132)				
High Leverage * Oil price growth (t -1)				-0.0711				
				(0.101)				
Low Profitability * Oil price growth (t -1)					-0.0170			
					(0.113)			
High Profitability * Oil price growth (t -1)					0.206			
					(0.129)			
PAB * Oil price growth (t -1)						-0.0864		
						(0.103)		
Foreign bank * Oil price growth (t -1)							0.280**	
							(0.114)	
Domestic bank * Oil price growth (t -1)								-0.0918
								(0.108)
Macro Controls	Y	Y	Y	Y	Y	Y	Y	Y
Bank Controls	Y	Y	Y	Y	Y	Y	Y	Y
Year Dummies	Y	Y	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y	Y	Y
Observations	211	179	211	211	208	211	211	211
Number of Banks	55	48	55	55	54	55	55	55
R-squared	0.567	0.657	0.559	0.567	0.578	0.556	0.566	0.555

Note: This table shows the impact of an oil price shock across banks with different characteristics on credit growth.
Standard errors in parentheses.
Robust standard errors are used.
* p < 0:10, ** p < 0:05, *** p < 0:01
Dependent variable is credit growth.
The list of macro and bank controls is as used explained in the methodology, however, we exclude the exchange rate growth (as it is always statistically insignificant) as well as the private credit to GDP ratio and government securities growth.

Table 1B: Determinants of Credit Growth

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Oil Price growth (t -1)	-0.497 (0.297)	-0.737** (0.300)	-0.684** (0.304)	-0.976*** (0.177)	-1.080*** (0.192)	-0.969*** (0.193)	-0.803 (0.751)
Small PAB bank * Oil price growth (t -1)	0.180 (0.256)						
Large PAB bank * Oil price growth (t -1)	-0.243** (0.0992)						
Small Foreign bank * Oil price growth (t -1)		1.306*** (0.157)					
Large Foreign bank * Oil price growth (t -1)		0.120 (0.126)					
Small Domestic bank * Oil price growth (t -1)			-0.0292 (0.244)				
Large Domestic * Oil price growth (t -1)			-0.0932 (0.0864)				
Low NPL PAB bank * Oil price growth (t -1)				-0.265* (0.134)			
High NPL PAB bank * Oil price growth (t -1)				-0.249 (0.222)			
Low NPL Foreign bank * Oil price growth (t -1)					1.423*** (0.211)		
High NPL Foreign bank * Oil price growth (t -1)					0.683** (0.266)		
Low NPL Domestic bank * Oil price growth (t -1)						0.0371 (0.204)	
High NPL Domestic bank * Oil price growth (t -1)						0.0357 (0.0813)	
Private Domestic Bank * Oil price growth (t -1)							-0.832*** (0.234)
Macro Controls	Y	Y	Y	Y	Y	Y	Y
Bank Controls	Y	Y	Y	Y	Y	Y	Y
Year Dummies	Y	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y	Y
Observations	211	211	211	179	179	179	73
Number of Banks	55	55	55	48	48	48	21
R-squared	0.568	0.571	0.554	0.667	0.688	0.656	0.606

Note: This table shows the impact of an oil price shock across banks with different characteristics on credit growth.
Standard errors in parentheses.
Robust standard errors are used.
* p < 0:10, ** p < 0:05, *** p < 0:01
Dependent variable is Credit growth.
The list of macro and bank controls is as explained in the methodology, however, we exclude the exchange rate growth (as it is always statistically insignificant) as well as the private credit to GDP ratio and government securities growth.

Table 2A: Determinants of NPL Growth

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Oil Price growth (t -1)	-3.088	-4.486	-5.130*	-2.671	-4.526	-4.195	-5.718**	-4.864*
	(3.027)	(2.893)	(2.857)	(3.254)	(2.808)	(2.953)	(2.775)	(2.852)
Small Bank * Oil price growth (t -1)	-0.481							
	(1.301)							
Large Bank * Oil price growth (t -1)	-1.471**							
	(0.696)							
Low NPL * Oil price growth (t -1)		-1.181						
		(0.853)						
High NPL * Oil price growth (t -1)		0.130						
		(0.746)						
Low Liquidity * Oil price growth (t -1)			0.275					
			(0.408)					
High Liquidity * Oil price growth (t -1)			1.533					
			(1.668)					
Low Leverage * Oil price growth (t -1)				2.463				
				(1.568)				
High Leverage * Oil price growth (t -1)				-0.399				
				(0.672)				
Low Profitability * Oil price growth (t -1)					-0.671			
					(0.768)			
High Profitability * Oil price growth (t -1)					0.541			
					(1.148)			
PAB * Oil price growth (t -1)						-0.909		
						(0.603)		
Foreign bank * Oil price growth (t -1)							2.384*	
							(1.250)	
Đomestic bank * Oil price growth (t -1)								-0.504
								(0.621)
Macro Controls	Y	Y	Y	Y	Y	Y	Y	Y
Bank Controls	Y	Y	Y	Y	Y	Y	Y	Y
Year Dummies	Y	Y	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y	Y	Y
Observations	167	167	167	167	167	167	167	167
Number of Banks	47	47	47	47	47	47	47	47
R-squared	0.244	0.234	0.233	0.236	0.223	0.227	0.261	0.219

Note: This table shows the impact of an oil price shock across banks with different characteristics on NPL growth.
Standard errors in parentheses.
Robust standard errors are used.
* p < 0:10, ** p < 0:05, *** p < 0:01
Dependent variable is NPL growth.
The list of macro and bank controls is as explained in the methodology, however, we exclude the exchange rate growth (as it is always statistically insignificant) as well as the private credit to GDP ratio and government securities growth.

Table 2B: Determinants of NPL Growth

	(1)	(2)	(3)	(4)	(5)	(6)
Oil Price growth (t -1)	-3.156	-4.801	-5.010	-4.666	-3.242	-4.977**
	(2.770)	(2.877)	(2.877)	(2.927)	(2.789)	(2.881)
Small PAB bank * Oil price growth (t -1)	2.983*					
	(1.633)					
Large PAB bank * Oil price growth (t -1)	-1.023*					
	(0.560)					
Small Foreign bank * Oil price growth (t -1)		0.199				
		(1.070)				
Large Foreign bank * Oil price growth (t -1)		33.06				
		(42.64)				
Small Domestic bank * Oil price growth (t -1)			-2.610			
			(1.749)			
Large Domestic bank * Oil price growth (t -1)			-0.526			
			(0.592)			
Low NPL PAB bank * Oil price growth (t -1)				-0.730		
				(0.679)		
High NPL PAB bank * Oil price growth (t -1)				-0.617		
				(0.813)		
Low NPL Foreign bank * Oil price growth (t -1)					-2.954	
					(4.931)	
High NPL Foreign bank * Oil price growth (t -1)					5.162*	
					(2.711)	
Low NPL Domestic bank * Oil price growth (t -1)						-1.042*
						(0.607)
High NPL Domestic bank * Oil price growth (t -1)						0.407
						(0.656)
Macro Controls	Y	Y	Y	Y	Y	Y
Bank Controls	Y	Y	Y	Y	Y	Y
Year Dummies	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y
Observations	167	167	167	167	167	167
Number of Banks	47	47	47	47	47	47
R-squared	0.248	0.218	0.230	0.221	0.243	0.224

Note: This table shows the impact of an oil price shock across banks with different characteristics on NPL growth.
Standard errors in parentheses.
Robust standard errors are used.
* p < 0:10, ** p < 0:05, *** p < 0:01
Dependent variable is NPL growth.
The list of macro and bank controls is as explained in the methodology, however, we exclude the exchange rate growth (as it is always statistically insignificant) as well as the private credit to GDP ratio and government securities growth.

Table 3A: Determinants of Deposit Growth

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Oil Price growth (t -1)	0.385	0.326	0.698**	0.472	0.559*	0.501*	0.559*	0.471
	(0.322)	(0.339)	(0.299)	(0.304)	(0.311)	(0.298)	(0.285)	(0.287)
Small Bank * Oil price growth (t -1)	0.171							
	(0.206)							
Large Bank * Oil price growth (t -1)	0.125							
	(0.0917)							
Low NPL * Oil price growth (t -1)		0.0122						
		(0.110)						
High NPL * Oil price growth (t -1)		-0.196						
		(0.143)						
Low Liquidity * Oil price growth (t -1)			0.0785					
			(0.118)					
High Liquidity * Oil price growth (t -1)			-0.389***					
			(0.109)					
Low Leverage * Oil price growth (t -1)				-0.341*				
				(0.194)				
High Leverage * Oil price growth (t -1)				-0.123				
				(0.121)				
Low Profitability * Oil price growth (t -1)					0.117			
					(0.136)			
High Profitability * Oil price growth (t -1)					-0.0257			
					(0.131)			
PAB * Oil price growth (t -1)						0.0463		
						(0.115)		
Foreign bank * Oil price growth (t -1)							-0.263**	
							(0.120)	
Domestic bank * Oil price growth (t -1)								0.130
								(0.108)
Macro Controls	Y	Y	Y	Y	Y	Y	Y	Y
Bank Controls	Y	Y	Y	Y	Y	Y	Y	Y
Year Dummies	Y	Y	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y	Y	Y
Observations	210	178	210	210	207	210	210	210
Number of Banks	55	48	55	55	54	55	55	55
R-squared	0.291	0.364	0.334	0.301	0.295	0.283	0.301	0.288

Note: This table shows the impact of an oil price shock across banks with different characteristics on deposit growth.
Standard errors in parentheses.
Robust standard errors are used.
* p < 0:10, ** p < 0:05, *** p < 0:01
Dependent variable is deposit growth.
The list of macro and bank controls is as explained in the methodology, however, we exclude the exchange rate growth (as it is always statistically insignificant) as well as the private credit to GDP ratio and government securities growth.

Table 3B: Determinants of Deposit Growth

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Oil Price growth (t-1)	0.508*	0.534*	0.489	0.340	0.323	0.324	1.737***
	(0.289)	(0.298)	(0.293)	(0.351)	(0.386)	(0.362)	(0.538)
Small PAB bank * Oil price growth (t-1)	0.235						
	(0.473)						
Large PAB bank * Oil price growth (t-1)	0.0423						
	(0.101)						
Small Foreign bank * Oil price growth (t-1)		-0.447**					
		(0.211)					
Large Foreign bank * Oil price growth (t-1)		0.0373					
		(0.162)					
Small Domestic bank * Oil price growth (t-1)			0.119				
			(0.224)				
Large Domestic bank * Oil price growth (t-1)			0.162***				
			(0.0586)				
Low NPL PAB bank * Oil price growth (t-1)				-0.0144			
				(0.118)			
High NPL PAB bank * Oil price growth (t-1)				-0.0456			
				(0.153)			
Low NPL Foreign bank * Oil price growth (t-1)					-0.543**		
					(0.266)		
High NPL Foreign bank * Oil price growth (t-1)					-1.482***		
					(0.279)		
Low NPL Domestic bank * Oil price growth (t-1)						0.198	
						(0.119)	
High NPL Domestic bank * Oil price growth (t-1)						0.00698	
						(0.107)	
Private Domestic Bank * Oil price growth (t-1)							0.335**
							(0.136)
Macro Controls	Y	Y	Y	Y	Y	Y	Y
Bank Controls	Y	Y	Y	Y	Y	Y	Y
Year Dummies	Y	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y	Y
Observations	210	210	210	178	178	178	73
Number of Banks	55	55	55	48	48	48	21
R-squared	0.285	0.285	0.287	0.355	0.413	0.361	0.519

Note: This table shows the impact of an oil price shock across banks with different characteristics on deposit growth.
Standard errors in parentheses.
Robust standard errors are used.
* p < 0:10, ** p < 0:05, *** p < 0:01
Dependent variable is deposit growth.
The list of macro and bank controls is as explained in the methodology, however, we exclude the exchange rate growth (as it is always statistically insignificant) as well as the private credit to GDP ratio and government securities growth.

Table 4: Determinants of Bank Credit Growth (system GMM)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Credit Growth (t-1)	0.182**	0.224***	0.183**	0.192**	0.185**	0.181**	0.176**	0.176**
	(0.072)	(0.0801)	(0.082)	(0.077)	(0.080)	(0.080)	(0.082)	(0.082)
Oil Price growth (t-1)	0.462	-0.0614	0.603	0.352	0.397	0.533	0.382	0.574
	(0.712)	(0.727)	(0.865)	(0.792)	(0.822)	(0.824)	(0.809)	(0.827)
Small Bank * Oil price growth (t-1)	0.430*							
	(0.223)							
Large Bank * Oil price growth (t-1)	-0.256**							
	(0.103)							
Low NPL * Oil price growth (t-1)		0.0726						
		(0.174)						
High NPL * Oil price growth (t-1)		-0.230						
		(0.176)						
Low Liquidity * Oil price growth (t-1)			0.144					
			(0.155)					
High Liquidity * Oil price growth (t-1)			-0.0345					
			(0.185)					
Low Leverage * Oil price growth (t-1)				0.0957				
				(0.271)				
High Leverage * Oil price growth (t-1)				0.140				
				(0.144)				
Low Profitability * Oil price growth (t-1)					-0.0214			
					(0.153)			
High Profitability * Oil price growth (t-1)					0.262			
					(0.197)			
PAB * Oil price growth (t-1)						-0.100		
						(0.132)		
Foreign * Oil price growth (t-1)							0.290*	
							(0.146)	
Domestic bank * Oil price growth (t-1)								-0.0965
								(0.138)
Macro Controls	Y	Y	Y	Y	Y	Y	Y	Y
Bank Controls	Y	Y	Y	Y	Y	Y	Y	Y
Year Dummies	Y	Y	Y	Y	Y	Y	Y	Y
AR(1)	-3.817	-2.855	-3.726	-3.733	-3.484	-3.711	-3.749	-3.700
AR(1) p-value	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000
AR(2)	-0.388	-0.351	-0.925	-0.745	-0.577	-0.769	-0.875	-0.782
AR(2) p-value	0.698	0.726	0.355	0.456	0.564	0.442	0.382	0.435
Hansen	29.79	27.56	25.56	35.55	30.81	32.83	32.37	32.50
Hansen p-value	0.0279	0.0356	0.00241	0.00526	0.0211	0.0175	0.0199	0.0192
Observations	210	178	210	210	207	210	210	210
Number of Banks	55	48	55	55	54	55	55	55
F-stat	6.924	5.977	4.013	5.057	4.348	4.681	4.798	5.027
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
No. of instruments	38	37	30	38	38	37	37	37

Note: This table shows the impact of an oil price shock across banks with different characteristics on credit growth using a system GMM estimation. AR(p) results are the Arrelano- Bond test for zero autocorrelation while the Hansen J statistic tests the null over identification restrictions. Standard errors in parentheses. * p < 0:10, ** p < 0:05, *** p < 0:01 Dependent variable is credit growth. The list of macro and bank controls is as explained in the methodology, however, we exclude the exchange rate growth (as it is always statistically insignificant) as well as the private credit to GDP ratio and government securities growth.

Table 5: Determinants of Bank NPL Growth (system GMM)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
NPL Growth (t-1)	-0.225	-0.224*	-0.185	-0.242*	-0.254*	-0.245*	-0.211	-0.241*
	(0.137)	(0.126)	(0.135)	(0.126)	(0.136)	(0.132)	(0.134)	(0.126)
Oil Price growth (t-1)	-2.709	-3.726	-4.146	-3.862	-3.570	-4.370	-4.852*	-3.780
	(2.916)	(2.556)	(3.065)	(2.949)	(2.516)	(2.825)	(2.591)	(2.605)
Small Bank * Oil price growth (t-1)	-3.589***							
	(1.112)							
Large Bank * Oil price growth (t-1)	-1.741***							
	(0.522)							
Low NPL * Oil price growth (t-1)		-1.441*						
		(0.806)						
High NPL * Oil price growth (t-1)		-0.225						
		(0.675)						
Low Liquidity * Oil price growth (t-1)			-0.314					
			(0.456)					
High Liquidity * Oil price growth (t-1)			1.530					
			(1.370)					
Low Leverage * Oil price growth (t-1)				1.796				
				(1.536)				
High Leverage * Oil price growth (t-1)				-0.306				
				(0.509)				
Low Profitability * Oil price growth (t-1)					-0.670			
					(0.779)			
High Profitability * Oil price growth (t-1)					0.418			
					(1.377)			
PAB * Oil price growth (t-1)						-1.383***		
						(0.438)		
Foreign * Oil price growth (t-1)							2.251**	
							(0.882)	
Domestic bank * Oil price growth (t-1)								-0.00815
								(0.544)
Macro Controls	Y	Y	Y	Y	Y	Y	Y	Y
Bank Controls	Y	Y	Y	Y	Y	Y	Y	Y
Year Dummies	Y	Y	Y	Y	Y	Y	Y	Y
AR(1)	-2.304	-2.369	-2.572	-2.309	-2.337	-2.282	-2.445	-2.287
AR(1) p-value	0.021	0.018	0.010	0.021	0.019	0.023	0.015	0.022
AR(2)	-0.699	-0.623	0.913	-0.300	-0.468	-0.170	-0.0606	-0.495
AR(2) p-value	0.485	0.533	0.361	0.764	0.640	0.865	0.952	0.621
Hansen	30.86	30.37	11.76	23.22	20.67	27.95	27.09	24.07
Hansen p-value	0.0761	0.0848	0.465	0.332	0.479	0.177	0.208	0.343
Observations	151	151	151	151	151	151	151	151
Number of Banks	46	46	46	46	46	46	46	46
F-stat	6.086	1.561	2.164	2.451	1.480	2.100	1.943	1.640
Prob > F	0.000	0.105	0.015	0.006	0.134	0.021	0.034	0.087
No. of instruments	43	43	34	43	43	42	42	42

Note: This table shows the impact of an oil price shock across banks with different characteristics on NPL growth using a system GMM estimation. AR(p) results are the Arrelano- Bond test for zero autocorrelation while the Hansen J statistic tests the null over identification restrictions. Standard errors in parentheses. * p < 0:10, ** p < 0:05, *** p < 0:01 Dependent variable is NPL growth. The list of macro and bank controls is as explained in the methodology, however, we exclude the exchange rate growth (as it is always statistically insignificant) as well as the private credit to GDP ratio and government securities growth.

Table 6: Determinants of Bank Deposit Growth (system GMM)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Deposit Growth (t-1)	0.212***	0.166***	0.210***	0.198***	0.208***	0.217***	0.533*	0.216***
	(0.0622)	(0.0478)	(0.0642)	(0.0572)	(0.0651)	(0.0654)	(0.313)	(0.0668)
Oil Price growth (t-1)	0.152	0.475	0.516	0.286	0.235	0.181	-0.0276	0.246
	(0.953)	(1.130)	(1.127)	(0.971)	(1.006)	(0.916)	(0.973)	(1.017)
Small Bank * Oil price growth (t-1)	-0.272							
	(0.302)							
Large Bank * Oil price growth (t-1)	0.179							
	(0.124)							
Low NPL * Oil price growth (t-1)		0.103						
		(0.212)						
High NPL * Oil price growth (t-1)		-0.143						
		(0.233)						
Low Liquidity * Oil price growth (t-1)			-0.214					
			(0.285)					
High Liquidity * Oil price growth (t-1)			-0.328**					
			(0.160)					
Low Leverage * Oil price growth (t-1)				-0.323				
				(0.307)				
High Leverage * Oil price growth (t-1)				-0.332				
				(0.223)				
Low Profitability * Oil price growth (t-1)					-0.0239			
					(0.279)			
High Profitability * Oil price growth (t-1)					0.123			
					(0.166)			
PAB * Oil price growth (t-1)						0.283		
						(0.171)		
Foreign * Oil price growth (t-1)							-0.316*	
							(0.180)	
Domestic bank * Oil price growth (t-1)								-0.103
								(0.207)
Macro Controls	Y	Y	Y	Y	Y	Y	Y	Y
Bank Controls	Y	Y	Y	Y	Y	Y	Y	Y
Year Dummies	Y	Y	Y	Y	Y	Y	Y	Y
AR(1)	-3.740	-2.869	-3.696	-3.447	-3.675	-3.673	-2.889	-3.654
AR(1) p-value	0.000	0.004	0.000	0.001	0.000	0.000	0.004	0.000
AR(2)	0.208	1.395	1.390	0.353	0.918	0.911	0.691	0.812
AR(2) p-value	0.835	0.163	0.164	0.724	0.358	0.362	0.490	0.417
Hansen	22.00	24.10	19.59	23.88	28.01	27.04	26.02	26.82
Hansen p-value	0.185	0.0872	0.0206	0.123	0.0449	0.0782	0.0741	0.0824
Observations	210	178	210	210	207	210	210	210
Number of Banks	55	48	55	55	54	55	55	55
F-stat	2.284	19.56	2.255	2.194	2.079	2.106	2.272	1.785
Prob > F	0.000	0.000	0.009	0.012	0.018	0.018	0.011	0.052
No. of instruments	38	37	30	38	38	37	36	37

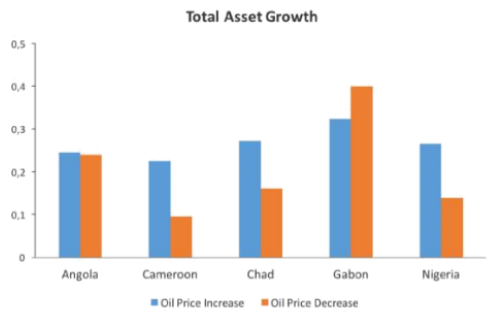
Note: This table shows the impact of an oil price shock across banks with different characteristics on deposit growth using a system GMM estimation. AR(p) results are the Arrelano- Bond test for zero autocorrelation while the Hansen J statistic tests the null over identification restrictions. Standard errors in parentheses. * p < 0:10, ** p < 0:05, *** p < 0:01 Dependent variable is deposit growth. The list of macro and bank controls is as explained in the methodology, however, we exclude the exchange rate growth (as it is always statistically insignificant) as well as the private credit to GDP ratio and government securities growth.

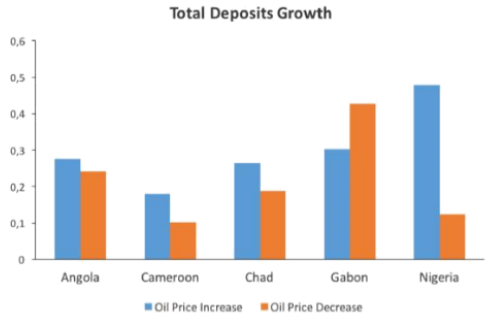
Table 7: Determinants of Government Securities

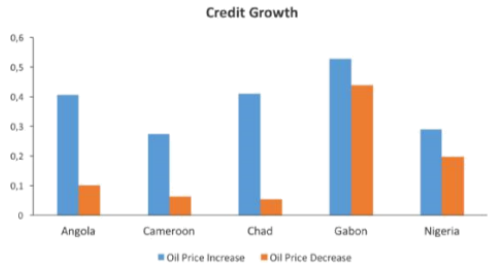
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Oil Price growth (t-1)	-1.156	-1.914	-0.310	-1.200	-2.938	-0.751	-2.088	-1.124	-1.152
	(2.624)	(2.631)	(2.812)	(2.619)	(2.761)	(2.532)	(2.720)	(2.657)	(2.653)
Deposit growth	1.483***	1.618***	1.530***	1.452***	1.484***	1.507***	1.544***	1.513***	1.659***
	(0.333)	(0.343)	(0.392)	(0.315)	(0.383)	(0.342)	(0.336)	(0.345)	(0.356)
Deposit growth (t-1)	-0.323***	-0.133	-0.330***	-0.333***	-0.324**	-0.309*	-0.327**	-0.317**	-0.310**
	(0.143)	(0.213)	(0.152)	(0.159)	(0.129)	(0.161)	(0.134)	(0.148)	(0.136)
Other Interest Income growth (t-1)	0.225	0.178	0.144	0.224	0.202	0.211	0.179	0.225	0.165
	(0.151)	(0.129)	(0.186)	(0.154)	(0.136)	(0.151)	(0.140)	(0.151)	(0.131)
Net Loans/ Total Assets (t-1)	1.743*	1.601*	1.856*	1.762*	1.836*	1.937*	1.771*	1.705*	1.659*
	(0.926)	(0.887)	(1.058)	(0.949)	(0.720)	(0.975)	(0.926)	(0.907)	(0.875)
lnAssets (t-1)	0.154	-0.0221	0.405	0.146	0.188	0.129	0.199	0.174	0.277
	(0.413)	(0.410)	(0.426)	(0.387)	(0.413)	(0.423)	(0.407)	(0.418)	(0.412)
Non-oil GDP growth (t-1)	-0.566	2.276	0.867	-0.298	2.677	0.0168	1.214	-0.794	1.040
	(5.130)	(4.497)	(4.090)	(5.566)	(5.720)	(5.648)	(5.143)	(5.193)	(4.925)
Inflation	5.712	5.890	2.780	5.461	10.20	5.616	6.287	5.753	6.591
	(4.628)	(4.086)	(4.339)	(4.385)	(6.254)	(4.546)	(4.452)	(4.644)	(4.420)
Exchange Rate growth	-1.494	-1.521	-1.300	-1.413	-2.309	-1.413	-1.533	-1.543	-1.698
	(1.560)	(1.468)	(1.798)	(1.491)	(1.518)	(1.500)	(1.579)	(1.570)	(1.545)
Small Bank * Oil price growth (t-1)		-2.009							
		(1.663)							
Large Bank * Oil price growth (t-1)		0.520							
		(0.410)							
Low NPL * Oil price growth (t-1)			-0.278						
			(0.373)						
High NPL * Oil price growth (t-1)			-0.800						
			(0.912)						
Low Liquidity * Oil price growth (t-1)				0.373					
				(0.439)					
High Liquidity * Oil price growth (t-1)				-0.0151					
				(0.987)					
Low Leverage * Oil price growth (t-1)					-6.358***				
					(1.799)				
High Leverage * Oil price growth (t-1)					0.0639				
					(0.428)				
Low Profitability * Oil price growth (t-1)						-0.749			
						(0.593)			
High Profitability * Oil price growth (t-1)						-0.590			
						(1.237)			
PAB * Oil price growth (t-1)							0.858**		
							(0.338)		
Foreign bank * Oil price growth (t-1)								0.355	
								(0.436)	
Domestic bank * Oil price growth (t-1)									-1.121**
									(0.507)
Year Dummies	Y	Y	Y	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	156	156	146	156	156	156	156	156	156
Number of Banks	42	42	40	42	42	42	42	42	42
R-squared	0.269	0.308	0.262	0.272	0.368	0.281	0.286	0.271	0.296

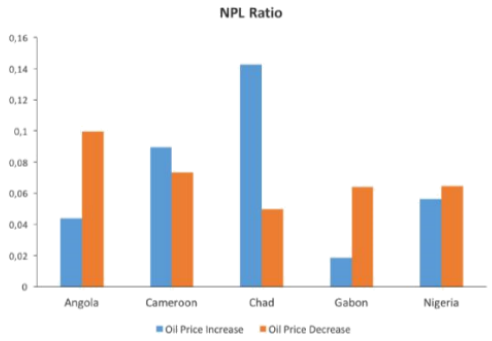
Note: This table shows the impact of an oil price shock across banks with different characteristics on government securities.
Standard errors in parentheses.
Robust standard errors are used.
* p < 0:10, ** p < 0:05, *** p < 0:01
Dependent variable is government securities

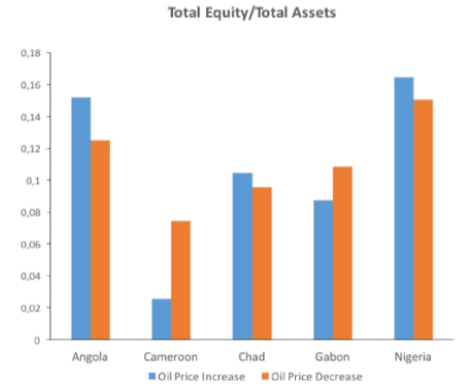
Appendix 1: Financial Soundness Indicators for Selected Regions

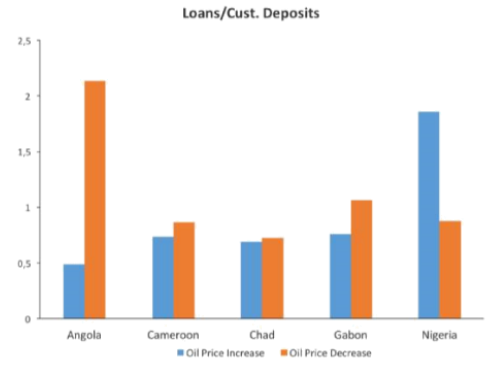


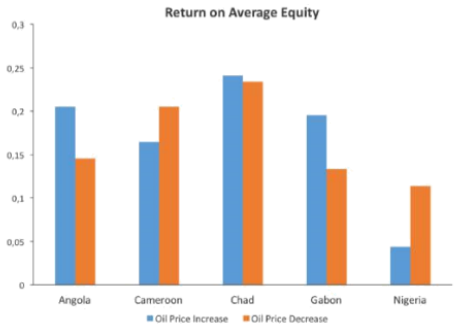






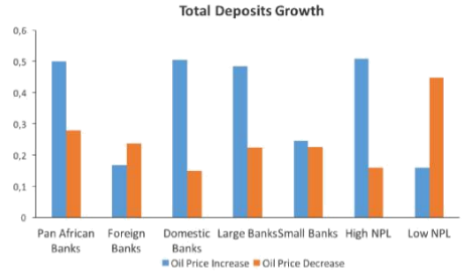


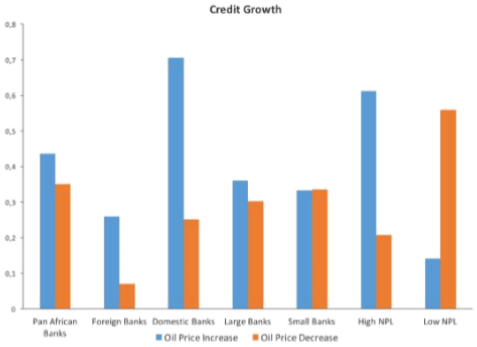


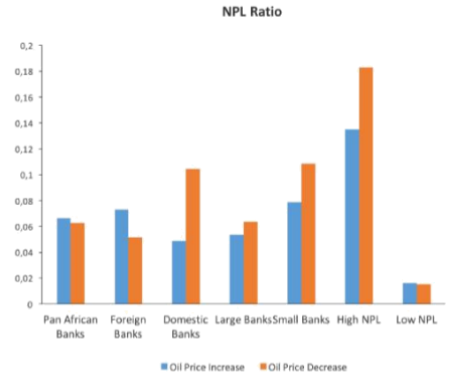


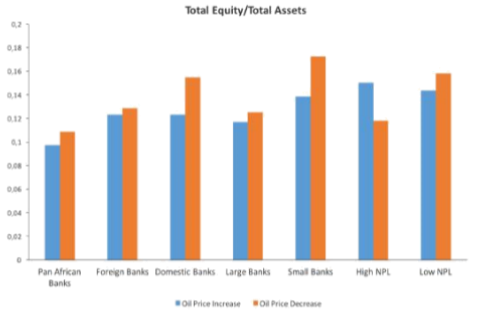
Sources: Fitch Connect and author's calculation.

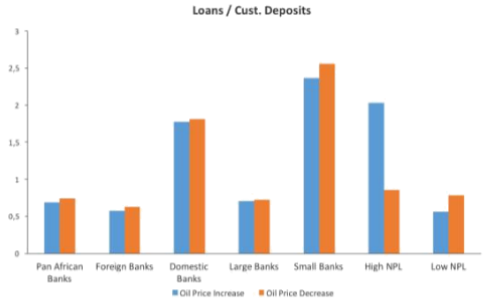
Appendix 2: Financial Soundness Indicators for Bank Level Characteristics

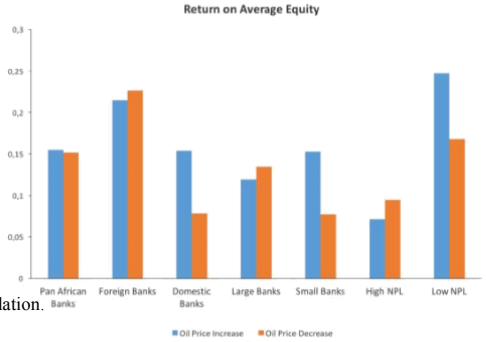












Sources: Fitch Connect and author's calculation.

Appendix 3: Variable Definitions and Data Sources

Variable Name	N	mean	s.d.	min	max	Description	Source
Oil Price Growth	353	-0.0544	0.252	-0.604	0.315	log difference in the international price of Brent Crude oil weighted by a country specific share of oil exports in the total export basket	IMF Primary Commodity Prices
Credit Growth	294	0.189	0.335	-2.155	2.960	log difference of gross loans	Fitch Connect
Deposit Growth	289	0.204	0.475	-0.638	4.996	log difference of total deposits	Fitch Connect
Log Total Assets	353	12.78	1.538	2.432	15.37	log of total assets	Fitch Connect
logit of NPL ratio	261	-3.080	1.225	-8.517	-0.063	logit of the ratio of total impaired loans to gross loans	Fitch Connect
NPL growth	206	0.294	0.841	-1.39	4.48	log difference of non-performing loans	Fitch Connect
Net Interest Income Growth	270	0.206	0.441	-3.204	2.267	log difference of net interest income	Fitch Connect
Government Securities Growth	198	0.206	0.754	-2.673	4.626	log difference of government securities	Fitch Connect
Other Interest Income Growth	270	0.132	0.622	-3.621	2.833	log difference of other interest income	Fitch Connect
Net Loans / Total Assets	350	0.415	0.154	0.0168	0.784	Ratio of net loans to total assets	Fitch Connect
Nonoil GDP Growth	295	0.122	0.0496	-0.0467	0.278	log difference of non-oil GDP	IMF WEO
Inflation	295	0.0788	0.0504	-0.0213	0.280	log difference of national consumer price index	IMF WEO
Exchange Rate Growth	295	0.0802	0.127	-0.425	0.501	log difference of national currency units per U.S. dollar (end-of-period)	IMF IFS
PAB	353	0.439	0.497	0	1	Dummy variable equating 1 if bank is a Pan-African Bank	Authors Calc
Private Credit to GDP	347	0.152	0.054	0.039	0.272	Ratio of private credit to GDP	IMF IFS
Foreign-owned Bank	353	0.176	0.381	0	1	Dummy variable equating 1 if bank is a Foreign-owned Bank	Authors Calc
Domestic	353	0.385	0.487	0	1	Dummy variable equating 1 if bank is a Pan-African Bank	Authors Calc
Small Bank	353	0.255	0.436	0	1	= 1 for bottom 25 percent of banks with the lowest total bank assets for each year	Authors Calc
Large Bank	353	0.255	0.436	0	1	=1 for top 25 percent of banks with the highest total bank assets for each year	Authors Calc
Low NPL	263	0.262	0.441	0	1	= 1 for bottom 25 percent of banks with the lowest NPL ratios for each year	Authors Calc
High NPL	263	0.262	0.441	0	1	= 1 for top 25 percent of banks with the highest NPL ratios for each year	Authors Calc
Low Liquidity	346	0.254	0.436	0	1	=1 for top 25 percent of banks with highest loans to customer deposit ratios for each year	Authors Calc
High Liquidity	346	0.257	0.438	0	1	=1 for bottom 25 percent of banks with lowest loans to customer deposit ratios for each year	Authors Calc
Low Leverage	353	0.255	0.436	0	1	=1 for bottom 25 percent of banks with lowest total equity to total assets ratios for each year	Authors Calc
High Leverage	353	0.255	0.436	0	1	=1 for top 25 percent of banks with highest total equity to total assets ratios for each year	Authors Calc
Low Profitability	311	0.260	0.440	0	1	=1 for bottom 25 percent of banks with lowest return on average equity ratios for each year	Authors Calc
High Profitability	311	0.260	0.440	0	1	=1 for top 25 percent of banks with highest return on average equity ratios for each year	Authors Calc

Note: IMF WEO = IMF World Economic Outlook; IMF IFS = IMF International Financial Statistics

Data used for authors' calculation is taken from Fitch Connect

All Fitch Connect Data is bank level data while all IMF data is macro level data.

Appendix 4: List of Banks

		Pan-African Banks	Foreign-owned Banks	Domestic Banks
Angola				
1		Yes		
2				Yes
3		Yes		
4			Yes	
5				Yes
6				Yes
7				Yes
8				Yes
9			Yes	Yes
10			Yes	
11			Yes	
12				Yes
13				Yes
14				Yes
15		Yes		
Cameroon				
1		Yes		
2			Yes	
3				Yes
4		Yes		
5			Yes	
6			Yes	
7		Yes		
8		Yes		
9			Yes	
10			Yes	
Chad				
1				Yes
2		Yes		
3		Yes		
Congo, Republic				
1				Yes
2				Yes
3		Yes		
4		Yes		
Equatorial Guinea				
1		Yes		
2			Yes	
Gabon				
1				Yes
2		Yes		
3		Yes		
4		Yes		
5				Yes
Nigeria				
1		Yes		
2			Yes	
3		Yes		
4		Yes		
5				Yes
6				Yes
7		Yes		
8				Yes
9				Yes
10		Yes		
11		Yes		
12				Yes
13		Yes		
14				Yes
15			Yes	
16			Yes	
17		Yes		
18		Yes		
19				Yes
20				Yes
21		Yes		
22				Yes
23				Yes
Total	62	25	13	25