

BANKING CONCENTRATION AND BANKING PRICES: THE ROLE OF CRUDE OIL PRICES

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Abstract: *The degree of competition in the Nigerian banking sector matters for the efficiency of the production of banking services, the quality of banking products, and the degree of innovation in the banking sector. Given the heavy dependence of Nigerian economy on crude oil prices and the need to develop robustness in the performance of banking institutions in Nigeria, this study, which is based on the structure conduct performance (SCP) hypothesis, examines the effect of banking concentration on Nigeria banks' pricing. The study also investigates the impact of crude oil prices on banking concentration and its effects on bank price. This study adopts the panel static model that involves panel ordinary least squares, fixed effect model, and random effect model to test the empirical model. This study sampled 13 licensed commercial banks in Nigeria for the period 2014-2018. Findings reveal that bank concentration positively affect bank prices. It also shows that crude oil has a negative impact on bank prices. By implication, the role of crude oil can reduce bank competition through bank prices. However, high bank concentration can reduce the crude oil effect on bank prices.*

Keywords: Banking competition, banking prices, crude oil prices, banking industry

Introduction

The banking industry is an essential sector of a nation's economy as it facilitates the mobilization of financial resources, especially savings and deposits from surplus units to deficit units in the economy for financing investments. Competition in the Nigerian banking industry is important for reasons such as the efficiency of the production, the quality of banking products, and the degree of innovation in the banking sector. This study examines the effect of industrial competition on Nigeria banks' pricing. Moreover, the study further examines the impact of crude oil prices on banking competition structure and its effects on price competitiveness. Previous studies (Alqahtani, Samargandi, & Kutan, 2020; El-Chaarani, 2019; Kaffash, Aktas, & Tajik, 2020; Khandelwal, Miyajima, & Santos, 2016) have identified the impact of crude oil price fluctuations on the banking industry financial performance. Fluctuations in crude oil prices are fundamentally very important to any oil-based economies such as Nigeria, which derive over 90% of their total foreign earnings and over 80% total collected revenue from oil (Lucky & Andrew, 2016).

Industry competition as an important market characteristic that drives better results for the bank customers such as lower bank prices, improved products/services quality and more choice. In a more competitive bank market, prices charged by banks to customers will be closer to the costs incurred by banks. The speed with which a bank reacts to the changes in price by competitors determine the degree of competition (Australian Bankers' Association, 2014). In a competitive market one of the ways by which bankers seek to attract more customers is through price competition. By offering similar services for a lower price, bankers entice their customers to stay away from other service providers. The ability to buy the same services for less amount has clear benefits for the customers. For example, a customer will derive benefit when offered high interest in an interest-bearing savings account.

Crude oil price is considered as one of the drivers of business financial activities in both private and public sectors of the economy of oil producing and exporting countries. For this reason, considerable number studies have indicated that the economic development of the oil producing countries largely depend on the international crude oil price and crude oil shocks. To this effect crude oil prices has significant impact on banking activities in these crude oil producing and exporting countries. Lee and Lee (2019) revealed that oil prices have a significant impact on banking performance, as their increase triggers a reduction in banking performance in terms of capitalization, management efficiency, earning power, and liquidity. Kaffash et al. (2020) findings revealed that oil price changes affect the efficiency of banks in the Middle Eastern Oil-Exporting (MEOE) countries through both direct and indirect channels. El-Chaarani (2019) found a significant direct impact of crude oil prices on the financial performance of banking sector in Bahrain, Oman and Iran.

Nigeria being one of the top oil producers in Africa, which contribute 95% of Nigeria export earnings. The volatility of oil prices in recent years have adversely affected the competitiveness of banking institutions in Nigeria. Moreover, the new banking industrial structure of Nigeria banks lead to the issues of pricing competition, which affect the banks' performance in the market. In Nigeria, the prime lending rates of the Nigerian banks ranges between 15.14% and 17.95% between 2005-2018, but the maximum lending rates range between 18.36% and 31.44% during the same period (Central Bank of Nigeria, 2018). This shows that there is price competition in the Nigerian banking sector. But individual banks are free to set their lending rates with leading banks who control the market usually charging a more competitive lending rate as compared to less competitive banks. The wide variances of pricing indicate the market structure may have affect the pricing strategy of banking industry.

This study, which based on structure conduct performance (SCP) aims to examine the effect of industrial competition on Nigeria banks' pricing. Moreover, the study further examines the impact of crude oil prices on banking competition structure and its effects on price competitiveness. This study adopts the panel static model that involves panel ordinary least squares, fixed effect model, and random effect model to test the empirical model. The dependent variable of the study is bank prices (as a proxy for market conduct) while the independent variable is banking concentration (as a proxy for market structure). It also adopts crude oil price as an interacting/moderating variable to know whether the higher the prices of crude oil prices, the less effect banking competition would have on market prices. The study also controls for leverage risk, capital risk, expense ratio, and GDP growth rate.

This study examines 13 licensed commercial banks in Nigeria for the post consolidation period 2014-2018 (5 years). The study finds evidence of bank prices being influenced by bank concentration. It also finds that the predictive power of the SCP hypothesis in the Nigerian banking industry may be influenced by the changing crude oil prices. Banks may compete less in the banking sector if crude oil prices continue to rise. Thus, bank prices are sensitive to crude oil price volatility.

Literature Review

In recent past the banking industry in Nigeria has experienced notable changes in their competitive conditions as a result of financial integration, deregulation, privatization, mergers and acquisitions which has increase market concentration in banking. Increased in foreign bank participation and various financial reforms aimed at bailing out banks from financial crisis including the past 2008–2009 global financial crisis is some of the significant changes in banking competitions witnessed in the recent past. Previous studies have indicated that increased competition in banking industry can result in lower prices for bank financial products/services and better access to finance (Beck, Demirgüç-kunt, & Maksimovic, 2004; Yang & Shao, 2016). However, banking competition might have serious impact on bank efficiency which might force banks to undertake strategies of risk-taking due to lower banking prices. The banking industry concentration, which measure competition and banks state of health is crucial in analysing the effectiveness of banking prices (Kashyap & Stein, 1997).

From theoretical standpoint the issue of how the degree of competition in the market for bank credit impacts the effectiveness of banking prices is scarce and inconclusive. For example employing the Monti–Klein model to analyse the effects of interbank rates on deposit and lending rates in an oligopolistic banking market Freixas and Rochet (2009) shows that a high degree of bank competition will decrease the effects of interbank rates on the lending rate. This indicates that changing the policy rate by the central bank will lead to greater bank competition and marginal effects of monetary policy. Stiglitz and Greenwald (2003) employ the use a mean–variance to compare the effect of monetary policy in a restrictive and competitive system. They found that in a competitive environment the effect of raising interest rates on bank lending is weaker than in a more restricted environment. While (Alencar & Nakane, 2004) investigated monetary policy under perfectly competitive banking market and when banks have market power. Using the numerical simulations with the model economy parameterized to the Brazilian case. The result shows that greater bank competition in the loan market causes the economy to be more sensitive to changes in interest rate.

From the empirical standpoint Adams and Amel (2005), using the US business small loan origination data for 1996–2002, studied the relationship between banking competition and the transmission of monetary policy through the bank lending channel, measured by the Herfindahl index, on monetary policy transmission. They found that the impact of the bank lending channel is weaker as markets become more concentrated. However, the Herfindahl index does not necessarily measure the degree of competition.

Theoretical Foundation

This study uses the SCP hypothesis of banking competition. The SCP hypothesis argues that collusion among banks in a more concentrated market makes them to the ability to obtain higher profit through charging higher loan rates and offering lower deposit rates. The more

concentrated the bank market, the smaller degree of competition in the market, while the smallness of the number of firms in the market makes it more probable for them to collude together. A more dynamic interpretation is that such concentration may, on the contrary, be an indication of competition because consolidation may have been enforced by circumstances (Bikker, 2010).

The relations among bank market structure, efficiency and performance usually are easily evaluated in homogenous banking markets of the developed economy, where banks take advantage of their structure for their collusive practices, or in highly efficient competitive banking markets, which explains reasons for greater banking market concentration and high banking performance (Gonz, Razia, Búa, & Sestayo, 2019). The intensity of competition and pricing reflecting their peculiarities and competitive situation of the banking sector. In the emerging market banks fully adjust their loan interest rates to a change in the monetary policy rate. Though the pricing policies can vary substantially depending on the structure of the banking market. Another important determinant of bank pricing behaviour is the degree of concentration in the financial system. Berger (1995) states that a bank with a large market share may be able to set oligopolistic interest rates.

Theoretically, oil prices affect banking market structure through two basic channels: the inflation effect channel and the economic growth and unemployment effect channel (Lee & Lee, 2019). For inflation effect, Boyd, Levine, and Smith (2000) reported that increasing inflationary trend may raise banking credit market friction, which may results to negative impacts on the banking institutions performance. As for the economic growth and unemployment effect channel, a negative association was reported by previous research between crude oil price and economic growth (Brückner & Ciccone, 2010; Kilian & Vigfusson, 2011).

As reported by Hesse and Poghosyan (2016) when the economy is booming banks are inclined to expand their lending activities and generate more income due to increased activity in the financial market. In addition, banks generate less nonperforming loans when businesses are doing well, which boosts profitability. Margins may also increase typically with higher economic growth, contributing even further to better banking performance. On the other hand, a higher unemployment rate raises the credit default risk, thereby harming performance in the banking sector (Idris & Nayan, 2016). Higher oil prices are associated with higher liquidity and therefore higher deposits cash flows than can be intermediated into lending, this means a likely positive relationship between oil prices and bank performance.

Hypotheses Development

Bank Concentration and Bank Prices

Banks compete against each other to provide greater services to their customers, otherwise the customers will switch to other banks that will service them better. This makes them more efficient and productive, which is good for the economy. One of the obvious ways for a bank to retain their customers and attract new ones is through lowering their prices. In relatively monopolistic market structure banks can charge higher interest rates without risking the loss of prospective borrowers to the competitors. In such environment, optimal interest rates are determined by a risk-return trade-off between higher loan default risk and higher income in

non-default states. Conversely, in more-competitive market structure, banks' interest rates pricing is constrained by the threat of losing borrowers to the competitors. As deposit rates rise, banks become more eager to invest in risky assets as opposed to safe ones. This spurs competition for risky loans, causing banks to cut their interest rates. Loan rates decline and borrower incentives improve; so, intriguingly, the very presence of a risk-shifting bias that causes banks to compete more aggressively for loans ultimately makes loans safer (Arping, 2017).

Van Leuvensteijn et al. (2013), analyses the impact of loan market competition on the interest rates applied by euro area banks to loans during the period 1994–2004, using a novel measure of competition called the Boone indicator. They found evidence that stronger competition implies significantly lower spreads between bank and market interest rates for most loan market products, in line with expectations. This result implies that stronger competition causes both lower bank interest rates and a stronger pass-through of market rate changes into bank rates. Evidence of the latter was also presented by Error Correction Model (ECM) for bank rates. Further, banks compensate income losses from increased loan market competition by offering lower deposit rates. This result implies that the more fiercely banks compete with each other, the lower bank interest rates will be and the more strongly market rates will be passed through.

Yang and Shao (2016), examined how competition influences the loan supply reaction of banks to monetary policy through the bank lending channel and test whether this reaction differs in heterogeneous bank types. Based on a sample of Chinese banking micro-data over the period from 2003 to 2014, they found that increased competition in China's banking sector reduces the effectiveness of monetary policy transmission through the bank lending channel. Therefore, stronger competition can induce banks to boost loans by setting lower loan prices to attract new borrowers.

The determinant of bank pricing behaviour is the degree of competition in the loan or deposit market. Since Berger and Hannan (1989), tests discerning between the structure-conduct-performance and efficiency hypotheses in explaining bank pricing and bank profitability have attracted considerable interest in empirical banking. Market power is proxied by market share, which we calculate for each of the loan and deposit products separately. This is consistent with the relative market power hypothesis advanced by Berger (1995) which states that a bank with a large market share in a certain product market may be able to set interest rates less competitively for that particular product. A negative (positive) effect of the market share variable on the deposit spread (loan mark-up) would thus corroborate the relative market power hypothesis. The alternative hypothesis is that banks' pricing decisions are driven by the degree of their operational efficiency. The rationale is that efficient banks have the incentive to use their cost-effectiveness to post below- average lending rates or above-average deposit rates.

H1: There is a positive relationship between Bank Concentration and Bank Prices

Impact of crude oil prices on the relationship between bank prices and bank concentration

Adam (2016) investigated the response of interest rates set by Bank of Indonesia (BI) to the prices of world crude oil and foreign interest rates. He analysed monthly data which spanned from July 2005 to October 2015. The tool of analysis used was the difference equation model.

Result of the test showed that there was a positive response of the interest rate determined by Bank of Indonesia to the price of world crude oil and foreign interest rates. The interest rates maintained by Bank of Indonesia increased (decreased) by 0.135% in response to each 1% increase (decrease) in the price of world crude oil.

Al-Khazali and Mirzaei (2017) investigated whether oil prices shocks have any impact on bank non-performing loans (NPLs), and if so, whether the effect is homogenous across banks. Three main results emerge. First, changes in oil prices do have a significant impact on bank NPLs: A rise (fall) in oil prices is associated with a decrease (increase) in NPLs. Second, oil prices shocks have asymmetric effects on bank problem loans, with negative oil price movements generally have a greater impact than positive oil price movements. Third, the unfavourable impact of adverse oil prices shocks on the quality of bank loans tends to be more pronounced in large banks.

Based on the above review this study hypothesized that:

H2: Crude Oil Price has a moderating effect on the relationship between bank prices and bank concentration

Methodology

This study is a quantitative and longitudinal research. It adopts the panel static model that involves panel ordinary least squares, fixed effect model, and random effect model to test the empirical model. The empirical model is as follows:

$$BankPrices_{it} = \alpha_0 + \beta_1 BankCon_{it} + \beta_3 CrudeOilPrice_{it} + \beta_4 BankCon * CrudeOilPrice_{it} + BankProfitability_{it} + GDPGrowthR_{it} + \varepsilon_{it} \dots \text{Eq. 1}$$

The dependent variable of the study is bank prices (as a proxy for market conduct) while the independent variable is banking concentration (as a proxy for market structure). Bank price was measured using banks' prime lending rate while bank concentration was measured using the square of an individual bank's loans and advances to the total loans and advances for the banking sector. It also adopts crude oil price as an interacting/moderating variable to know whether the higher the prices of crude oil prices, the less effect banking competition would have on market prices. The study also controls for GDP growth rate. Bank profitability was measured using return on assets (i.e. the ratio of earnings before interest and taxes on total assets).

A total of 13 licensed commercial banks in Nigeria was sampled for the post consolidation period 2014-2018 (5 years). The data for this study was sourced from the Central Bank of Nigeria, World Bank Development Indicators, and DataStream Database. The crude oil price data was obtained from OPEC average annual crude oil prices. The macroeconomic variable data of GDP growth rate was obtained from the World Bank Development Indicators.

Empirical Findings

Table 1 Descriptive Statistics (Before Log Transformation)

	Mean	Median	Std. Dev.	Skewness	Kurtosis
Bank Prices	14.800	15.000	1.612	0.035	1.418
Bank Concentration	0.000	0.000	0.000	1.788	2.857

GDP Growth Rate	2.016	1.922	2.608	0.342	2.301
Bank Profitability	2.544	2.540	1.385	0.453	3.139
Crude Oil Prices	56.896	49.490	20.249	1.353	3.064

Table 1 shows the descriptive statistics of the variables of this paper. The average bank price across the sampled banks is 14.8 percent. The average return on assets across the sampled banks is 2.54 percent, which represents the bank profitability. Even with the standard deviation of 1.385 for bank profitability, there is an evidence that each of the sample banks has a history of positive bank profitability. This is also supported by its positive skewed value. All the values of the skewness and kurtosis are within the threshold values of +7 and -7 as suggested by Hair et al. (1995). It implies that the data for this study does not show any non-normality issue. The average GDP growth rate stood at 2.016 for Nigeria, however, its standard deviation is 2.608, higher than its mean value. This indicates a negative GDP growth rate during the sample period 2014-2018. This is evident in 2017 and 2018 when Nigeria experienced recession following two consecutive quarters of negative GDP rate. The average crude oil price is 56.89, which is slightly higher than the benchmark of \$50 per barrel that is always set by the Nigerian government in its budget annually. However, fluctuations in World crude oil price may significantly affect the Nigeria economy due to the large standard deviation value of 20.249, an indication of why Nigeria at sometimes experience negative GDP growth in some quarters.

Table 2 Correlation Matrix

	1	2	3	4	5
1. Bank price	1.000				
2. Bank concentration	0.160	1.000			
3. GDP growth rate	-0.594	-0.105	1.000		
4. Bank Profitability	0.199	0.061	-0.047	1.000	
5. Crude oil price	-0.603	-0.142	0.745	0.011	1.000

Results shown in Table 2 review that there is no serious problem of multicollinearity since no correlation coefficient is higher than 0.80 as suggested by Hair, Anderson, Tatham and Black (1995). The table also shows that crude oil price has a negative correlation with bank price and bank concentration. Crude oil price has more effects on bank price (i.e. lending rate) than the assets of the firm which forms the basis of each individual bank concentration. However, there is a positive correlation between crude oil price and GDP growth rate. This is because Nigeria's main source of revenue is oil. Crude oil price also has a marginal positive correlation with bank profitability. As may be expected, bank price has a positive correlation with bank profitability.

Table 3 Relationship between Bank Concentration and Bank Prices

Variables	POLS	RE	FE	POLS(Robust)
Constant	2.8306*** (0.0000)	2.8306*** (0.000)	5.7534*** (0.000)	2.8306*** (0.0000)
Bank Concentration	0.0062 (0.4580)	0.0062 (0.454)	0.1606** (0.035)	0.0062 (0.4070)
GDP Growth Rate	-0.0852*** (0.0000)	-0.0852*** (0.000)	-0.0671** (0.002)	-0.0852*** (0.0000)
Bank Profitability	0.0308 (0.1650)	0.0308 (0.1580)	0.0921** (0.0480)	0.0308 (0.1190)

R Square	0.3910	0.3910	0.0897	0.3910
F-stat	9.42	-28.26	10.89	33.67
(P-value)	(0.000)	(0.000)	(0.000)	(0.000)
Wald X2				
Multicollinearity	1.01			
Poolability Test	0.740 (0.7019)	-	-	-
BP LM Test		0.000 (1.0000)		-
Hausman Test	-		-	-
No. of Obs.	48	48	48	48

Note: *, **, and *** are significant at the 10%, 5%, and 1% respectively.

Table 3 shows the relationships between bank concentration and bank prices. The findings reveal that bank concentration has significant positive impact on bank prices when the regression model is a fixed effect model, although with the least R square value of about 8.97 percent. The R square values for POLS, RE, and POLS (robust) models are same with a value of 39.10 percent. GDP growth rate shows significantly negative effects on bank prices across the four models. Negative GDP growth may reduce the bank lending rate for banks to compete and enable increased investments. Bank profitability has a positive impact on bank price when FE model is considered. The Diagnostics tests show that there is no serious problem of multicollinearity as the mean value is less than 3.3 suggested by Hair et al. (1995). The Poolability result shows that POLS model is better than FE model. The Breusch-Pagan LM test also shows that the RE model is not effective. The appropriate model for the relationship between bank concentration and bank prices is POLS, however, in this model, bank concentration does not affect bank price. This may be due to the small number of observations.

Table 4: Relationship between Bank Concentration, Crude Oil Prices, and Bank Prices

Variables	POLS	REM	FEM	POLS (Robust)
Constant	3.3109*** (0.000)	3.3109*** (0.000)	5.9913*** (0.000)	3.3109*** (0.000)
Bank Concentration	0.0045 (0.579)	0.0045 (0.576)	0.1389** (0.046)	0.0045 (0.545)
Crude Oil Price	-0.1351** (0.035)	-0.1351** (0.030)	-0.1795** (0.010)	-0.1351* (0.043)
GDP Growth Rate	-0.0446* (0.082)	-0.0446* (0.075)	-0.0135 (0.612)	-0.0446** (0.033)
Bank Profitability	0.0343 (0.110)	0.0343 (0.103)	0.1280*** (0.005)	0.0343* (0.087)
R Square	0.4512	0.4512	0.1259	0.4512
F-stat	8.84	35.35	11.72	46.52
P-value	(0.000)	(0.0000)	(0.000)	(0.000)
Wald X2				

Multicollinearity	1.65			
Poolability Test	1.12			
	(0.3827)			
BP LM Test		0.000		
		(1.000)		
Hausman Test	-	-	-	
No. of Observation	48	48	48	48

Note: *, **, and *** are significant at the 10%, 5%, and 1% respectively.

The relationships between bank concentration, crude oil prices, and bank prices are presented in Table 4. Bank concentration is significant in impacting bank prices as seen in the FE model. A percentage change in bank concentration leads to about 0.1389 percent increase in bank price. Crude oil price has negative impacts on bank price across the four models. An increase in crude oil price results in 0.1351 percent decrease in bank price, which is significant at the 5% significant level. As shown in Table 3, GDP growth rate also shows consistency in its impact on bank prices. GDP growth rate reduces bank price, and vice versa. Bank profitability shows a positive impact on bank price in FE and POLS (robust) models. There was a significant impact of crude oil price on the bank prices of sampled banks. The R Square increases from about 39.10% when crude oil was not included in the model to about 45.12% when crude oil price was included. Thus, despite the negative impact of crude oil on bank prices, on aggregate, bank price significantly increases. This is because the inclusion of the crude oil prices reduces the negative effects of GDP growth rate and further increases bank profitability of the sampled firms. Diagnostics tests show that there is no serious multicollinearity issues, Poolability result confirms the suitability of POLS over FE model while BP LM test also confirms the suitability of POLS model over RE model.

Table 5: Moderating Effect of Crude Oil Price on the link between Bank Concentration, Bank Prices

Variables	POLS	REM	FEM	POLS (Robust)
Constant	3.3542*** (0.000)	3.3542*** (0.000)	5.7375*** (0.000)	3.3542*** (0.000)
Bank Concentration	0.0079 (0.372)	0.0079 (0.367)	0.1264* (0.084)	0.0079 (0.407)
Crude Oil	-0.1298** (0.044)	-0.1298** (0.038)	-0.1771** (0.012)	-0.1298* (0.053)
Crude Oil Prices*Bank Concentration	-0.0257 (0.338)	-0.0257 (0.332)	-0.0170 (0.562)	-0.0257 (0.198)
GDP Growth Rate	-0.0453* (0.079)	-0.0453* (0.071)	-0.0146 (0.587)	-0.0453** (0.034)
Bank Profitability	0.0368* (0.090)	0.0368* (0.082)	0.1324*** (0.005)	0.0368* (0.066)
R Square	0.4632	0.4632	0.1422	0.4632
F-stat	7.25	36.24	9.25	33.80
P-value	(0.000)	(0.000)	(0.000)	(0.000)
Wald X2				

Multicollinearity	1.61			
Poolability Test	1.04			
	(0.4391)			
BP LM Test		0.000		
		(1.000)		
Hausman Test	-	-	-	
No. of Observation	48	48	48	48

Note: *, **, and *** are significant at the 10%, 5%, and 1% respectively.

Table 5 shows the moderating effects of crude oil price on the relationships between bank concentration, and bank prices. There are evidence of crude oil prices having significant negative effects on bank prices. Although the moderating effect of crude oil (i.e. Crude oil prices*bank concentration) reveals lower negative coefficients as compared to the higher coefficient of crude oil price alone, the coefficients are however not significant. It implies that bank concentration has an important role to play in the joint effect of crude oil price on bank prices. Banks with high deposits and loans and advances have marginal safety to cushion the effect of increasing and changing crude oil prices on bank prices. Despite the insignificance of interaction effects of crude oil prices, R square increases when compared to the values of R square in table 4. It indicates that banks that compete with bank prices must have higher asset values, loans and advances and deposits to cushion the negative impacts of crude oil price on bank prices.

Discussions and Conclusion

This study confirms that crude oil has impacts on banking prices, making banking competition in the Nigerian Banking industry more intense. As hypothesized, crude oil price has a moderating effect on the relationship between bank concentration and bank prices. This study also confirms the positive link between bank concentration and bank prices. This finding supports those of Berger (1995) that bank prices is positively influenced by bank concentration. It is however in contrast with studies that found negative effects of bank concentration on bank prices (Van Leuvensteijn et al., 2013; Yang & Shao, 2016). This may be due to the monopolistic market structure that banks in the Nigerian baking industry operate. Individual banks often focus on a specific sector to use bank prices in driving competition Individual Nigerian banks engage either in Oil and Gas sector, agricultural sector, finance sector, or telecommunication sector etc. Such monopolistic sectorial structure influences banks to charge higher interest rates without risking the loss of prospective borrowers in such sectors. It implies that the presence of high banking assets, deposits, and loans and advances can trigger higher bank prices. For example, banks with more deposits charge higher bank prices (i.e. high lending rate) on players in the Oil and gas industry. Since most big businesses in the production sector involve the oil and gas businesses, banks that give out more loans and advances charge high bank prices due to the volatility of the oil and gas sector.

The findings of this study reject the hypothesis that crude oil price moderates the relationship between bank concentration and bank prices. Although, crude oil on its own has a significant negative relationship with bank prices, it however does not have any significant effect on how bank concentration affects bank prices. It may be since bank prices also include volatility charges of the changes in crude oil price. That is, bank prices in Nigeria are sensitive to crude oil prices. A certain portion of bank prices may already account for crude oil price changes.

Thus, a further influence of crude oil price in moderating the link between bank concentration and bank prices may be insignificant. Moreover, since crude oil price negatively affect bank prices, it implies that bank may need a high level of banking sector concentration to augment the negative effect of crude oil if banks must use bank prices to further enhance their competitive advantage and position in the banking sector. In summary, this study has theoretical contribution for the SCP hypothesis that a country's main natural resources can influence the interactions between banking structure, banking conduct, and bank performance. Although, this study does not account for how large does bank price-oil induced behaviour affect bank prices, it however, has practical implications for investors and lenders to monitor crude oil prices and perhaps engage more in short-term investments whose payback period are short. In doing this, they can hedge the crude oil price effects of receiving a high interest rates on loanable funds.

References

- Adam, P. (2016). The response of bank of Indonesia's interest rates to the prices of world crude oil and foreign interest rates. *International Journal of Energy Economics and Policy*, 6(2), 266–272.
- Adams, R. M., & Amel, D. F. (2011). Market structure and the pass-through of the federal funds rate. *Journal of Banking and Finance*, 35(5), 1087–1096. <https://doi.org/10.1016/j.jbankfin.2010.09.020>
- Adams, R. M. M., & Amel, D. F. (2005). The Effects of Local Banking Market Structure on the Bank-Lending Channel of Monetary Policy. In *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.716349>
- Al-Khazali, O. M., & Mirzaei, A. (2017). The impact of oil price movements on bank non-performing loans: Global evidence from oil-exporting countries. *Emerging Markets Review*, 31, 193–208. <https://doi.org/10.1016/j.ememar.2017.05.006>
- Alencar, L. S. (2011). *Revisiting Bank Pricing Policies in Brazil: evidence from loan and deposit markets* (No. 235). Brasília.
- Alencar, L. S., & Nakane, M. I. (2004). Bank Competition, Agency Costs, and the Performance of the Monetary Policy. In *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.926337>
- Alqahtani, F., Samargandi, N., & Kutan, A. M. (2020). The influence of oil prices on the banking sector in oil-exporting economies: Is there a psychological barrier? *International Review of Financial Analysis*, 69(February), 101470. <https://doi.org/10.1016/j.irfa.2020.101470>
- Arping, S. (2017). Deposit competition and loan markets. *Journal of Banking and Finance*, 80(December), 108–118. <https://doi.org/10.1016/j.jbankfin.2017.04.006>
- Australian Bankers' Association. (2014). Competition in retail banking. In *Deloitte Access Economics*. [https://doi.org/10.1016/0024-6301\(82\)90028-0](https://doi.org/10.1016/0024-6301(82)90028-0)
- Beck, T., Demirgüç-kunt, A., & Maksimovic, V. (2004). Bank Competition and Access to Finance : International Evidence. *Journal of Money, Credit and Banking*, 36(3), 627–648.
- Berger, A. N. (1995). The Profit-Structure Relationship in Banking--Tests of Market-Power and Efficient- Structure Hypotheses. *Journal of Money, Credit and Banking*, 27(2), 404–431.
- Berger, A. N., & Hannan, T. H. (1989). The Price-Concentration Relationship in Banking. *The Review of Economics and Statistics*, 71(2), 291–299.
- Bikker, J. A. (2010). Measuring performance of banks as an assessment of competition. *Journal of Applied Business and Economics*, 11(4), 141–159.
- Boyd, J. H., Levine, R., & Smith, B. D. (2000). The impact of inflation on the financial sector

- performance. *Journal of Monetary Economics*, 47, 221–248.
- Brückner, M., & Ciccone, A. (2010). International commodity prices, growth and the outbreak of civil war in Sub-Saharan Africa. *Economic Journal*, 120(544), 519–534. <https://doi.org/10.1111/j.1468-0297.2010.02353.x>
- El-Chaarani, H. (2019). the Impact of Oil Prices on the Financial Performance of Banking Sector in Middle East Region. *International Journal of Energy Economics and Policy*, 9(5), 148–156. <https://doi.org/10.32479/ijeep.8075>
- Freixas, X., & Rochet, J.-C. (2009). The Microeconomics of Banking. In M. I. of Technology (Ed.), *Economic Record* (Second Edi, Vol. 85). <https://doi.org/10.1111/j.1475-4932.2009.00579.x>
- Fu, X. (Maggie), & Heffernan, S. (2009). The effects of reform on China's bank structure and performance. *Journal of Banking and Finance*, 33(1), 39–52. <https://doi.org/10.1016/j.jbankfin.2006.11.023>
- Fungáčová, Z., Shamshur, A., & Weill, L. (2017). Does bank competition reduce cost of credit? Cross-country evidence from Europe. *Journal of Banking and Finance*, 83, 104–120. <https://doi.org/10.1016/j.jbankfin.2017.06.014>
- Fungáčová, Z., Solanko, L., & Weill, L. (2014). Does competition influence the bank lending channel in the euro area? *Journal of Banking and Finance*, 49, 356–366. <https://doi.org/10.1016/j.jbankfin.2014.06.018>
- Gonz, L. O., Razia, A., Búa, M. V., & Sestayo, R. L. (2019). Market structure , performance , and efficiency : Evidence from the MENA banking sector. *International Review of Economics and Finance*, 64, 84–101. <https://doi.org/10.1016/j.iref.2019.05.013>
- Hair, J. F., Anderson, R. E., Tatham, R. L. & Black, W. C. (1995). *Multivariate data analysis*. Englewood Cliffs, New Jersey: Prentice-Hall.
- Hesse, H., & Poghosyan, T. (2016). Financial deepening and post-crisis development in emerging markets: Current perils and future dawns. *Financial Deepening and Post-Crisis Development in Emerging Markets*, 12, 1–279. <https://doi.org/10.1057/978-1-137-52246-7>
- Idris, I. T., & Nayan, S. (2016). The joint effects of oil price volatility and environmental risks on non-performing loans: Evidence from panel data of organization of the petroleum exporting countries. *International Journal of Energy Economics and Policy*, 6(3), 522–528.
- Kaffash, S., Aktas, E., & Tajik, M. (2020). The impact of oil price changes on the efficiency of banks. *Rairo Operations Research*, 54(4), 719–748. <https://doi.org/https://doi.org/10.1051/ro/2019009>
- Kashyap, A. K., & Stein, J. C. (1997). The Role of Banks in Monetary Policy: A Survey with Implications for the European Monetary Union. *Economic Perspectives*, 21, 2–18.
- Khandelwal, P., Miyajima, K., & Santos, A. (2016). The Impact of Oil Prices on the Banking System in the GCC. In *IMF Working Papers* (No. WP/16/161). <https://doi.org/10.5089/9781475523393.001>
- Kilian, L., & Vigfusson, R. J. (2011). Are the responses of the U.S. economy asymmetric in energy price increases and decreases? *Quantitative Economics*, 2(3), 419–453. <https://doi.org/10.3982/qe99>
- Lee, C., & Lee, C. (2019). Oil price shocks and Chinese banking performance : Do country risks matter ? *Energy Economics*, 77, 46–53. <https://doi.org/10.1016/j.eneco.2018.01.010>
- Lucky, L. A., & Andrew, A. (2016). Crude Oil Production and Nigerian Economic Growth : A Test of Dutch Disease and the Paradox of Plenty : 1981-2014. *IIARD International Journal*

- of Banking and Finance Research*, 2(2), 20–42.
- Olivero, M. P., Li, Y., & Jeon, B. N. (2011). Competition in banking and the lending channel: Evidence from bank-level data in Asia and Latin America. *Journal of Banking and Finance*, 35(3), 560–571. <https://doi.org/10.1016/j.jbankfin.2010.08.004>
- Stiglitz, J., & Greenwald, B. (2003). Towards a New Paradigm in Monetary Economics. In *Cambridge University Press*. <https://doi.org/10.1017/cbo9780511615207>
- van Leuvensteijn, M., Kok Sørensen, C., Bikker, J. A., & van Rixtel, A. R. J. M. (2013). Impact of bank competition on the interest rate pass-through in the euro area. *Applied Economics*, 45(11), 1359–1380. <https://doi.org/10.1080/00036846.2011.617697>
- Yang, J., & Shao, H. (2016). Impact of bank competition on the bank lending channel of monetary transmission: Evidence from China. *International Review of Economics and Finance*, 43, 468–481. <https://doi.org/10.1016/j.iref.2015.12.008>