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RESEARCH ARTICLE

STRUCTURE-CONDUCT-PERFORMANCE (SCP) PARADIGM: AN EMPIRICAL ANALYSIS OF NIGERIA BANKING INDUSTRY

¹Ayemidotun Damola and ²Enikanselu Ademola

¹Business Administration and Management Dept, Rufus Giwa Polytechnic, Owo, Ondo State, Nigeria

²Department of Economics Obafemi Awolowo University, Ile-Ife, Nigeria

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ABSTRACT

In the last two decades, the Nigerian banking industry had undergone some reforms and regulations with the main aim of making the industry more impactful to the growth and developmental goals of the economy. This had undoubtedly tampered with the structure of the nation's banking industries and perhaps negates some previous empirical findings on the structure and performance of the industry. Therefore, this study re-examined the structure, conduct, and performance paradigm in the Nigerian banking industry. The study employed secondary data from 2008 to 2017, which were obtained from the Nigerian stock exchange Annual report, Central Bank of Nigeria Statistical Bulletin, Fact Book and Annual report and accounts for commercial banks in Nigeria. To analyze the data obtained co-integration and error correction econometric techniques were used. Our findings revealed that the market power hypothesis with the notion that a direct relationship exists between the market concentration and bank performance was not very true. The performances of banks are not necessarily determined by its structure nor its concentration. The results negate a priori expectations of increased market power that could have possibly come from the banks' cartel and a corresponding increase in the level of concentration which could, in turn, increase bank performance. Consequently, the financial industry regulator in Nigeria should focus less on competition among the banks but pay attention to internal practices among the operators within the system.

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INTRODUCTION

The banking industry forms one of the major sectors in an economy. This is because banks play crucial roles in resource mobilization for productive activities that are necessary for national economic growth. For an economy to run smoothly, there must be a well-organized financial system. Banks constitute an integral and vital part of that system. Banks are responsible for the movement of free financial resources between surplus and deficit spending units. Also, it serves the financial needs of the veritable economic agents by making overdrafts and loans available for wealth creation. Therefore, banking activities constitute a major determinant of the amount of expenditure, investment, and international trade that are a fundamental component of economic output. Levine (1997) in his theoretical study opined that banks affect the overall economic growth of country through its effective and efficient intermediary roles.

Hence, the vivid perception of the SCP of the banking industry demands uttermost importance. The SCP paradigm evolved from the neo-classical market analysis to measure the rate of relationships that exist among market structures, conduct, and performance (Oloniluyi; Adeleye; Ogunleye; and Oladipupo, 2016). The paradigm postulates the existence of causal link between a market structure, the conduct of its participating firms and their performances. In other words, the paradigm holds that the structure of a market influences market conduct and subsequently affect its performance (Johann, 2010). In application to the banking industry, the SCP model holds that a higher bank concentration often results in a collusive tendency among large capitalized banks thereby causing an improved market performance. Existing literature revealed that many studies have been carried out on the structure, conduct and performance paradigm in both the developed and developing countries which cut across all industries including banking, manufacturing, insurance, telecommunication and so on (Berger and Hanna 1989; Pilloff and Rhoades 2002; Choi & Weiss 2005; Liebenberg & Kamerschen 2008; Cole *et al.* 2014; Berry-Stölzle *et al.* 2011; Choi & Weiss 2005; Cole *et al.* 2014).

*Corresponding author: Ayemidotun Damola,
Business Administration and Management Dept, Rufus Giwa
Polytechnic, Owo, Ondo State, Nigeria.

However, in Nigeria, the majority of the studies only addressed banking competition and profitability within a very short time frame, probably due to the paucity of data. Also, in the last decades, some reforms and regulations had been carried out in the Nigerian banking industry which undoubtedly had tampered with the structure of the nation's banking industry. Hence, this study is undertaken to examine, empirically, the analyses of the structure-conduct and performance paradigm in the Nigerian banking industry between the time frame of 2008 and 2017. This work is organized into five sections; the first section being the introduction. The second section takes a look at the review of the literature while the third section presents the methodology. The fourth section presents the discussion of empirical findings and lastly, the fifth section provides the conclusion and recommendations.

LITERATURE REVIEW

Examined from the literature, concentration in the banking market is usually analyzed in two ways within the realm of the structuralist approach: the SCP Hypothesis and the "Efficient Structure Hypothesis" (ESH). The SCP hypothesis, according to Bain (1951), measures the rate of competition in an industry relative to its structural characteristics. It assumes that concentration in an industry often results in collusive power, leading the banks to maximize supernormal profits by offering lower interest rates and in return charging higher interest on loans. In contrast, Demsetz (1973) maintains that Efficiency, rather than market power is responsible for the positive relationship between profitability and market concentration as larger firms with greater efficiency and larger market share reap finance and research economies. Moreover, Baumol (1982), developed another approach called "Contestable Market Theory (CMT)". The CMT is of the view that individual banks that constitute an industry may possess a unique behavior depending on the market characteristics in which they operate. He argued that a concentrated market can be characterized by competition when there are none or little barriers for new entrants to penetrate a market. This arrangement implies that competition can thrive even in a concentrated or an oligopolistic market. Therefore, a concentrated but contestable financial market should not necessarily post a threatening concern to the policymakers. These assertions are consistent with Allen and Gale (2000) who showed that a few capitalized banks with wide branch networks can provide a better competitive outcome than a unitary banking system in an environment with switching costs: a large-branch bank has less of an incentive to exploit the "locked-in" value of clients, reasoning from the fact that it is always competing for the clients' future business either in another product or location.

Surveyed from the literature, some of the most frequently applied market concentration measures are Reciprocity Index (RI); Concentration Ratio (CR); Gini Coefficient (GC), and Hirschmann-Herfindahl concentration index. Reciprocity is described as the inverse of the total number of market participants. This concept implies that the more the market participants, the lower the level of the reciprocity index, but where the market participant is single, the index equals to one. Reciprocity index is a low ranker of market concentration because it is premised on the wrong assumption that a higher number of market participants connotes a lower level of industry concentration, which does not necessarily mean so in reality. For example, if there are 100 participants in a market and one of them pooled the 90% market share while the other

99 participants share the remaining 10%, the reciprocity index will amount to 0.01 which implies an extremely unconcentrated market, but in reality, the situation is exactly the opposite. Concentration ratio (CR) is the most popular measure of concentration in literature. It is widely used because of its simplicity. It measures the sum of market shares of k participants with the highest shares. There is no rule for choosing an appropriate value of k , but it usually in the range of three to five participants. CR takes the following formula:

$$\text{Concentration ratio (CR)} = \sum_{i=1}^k S_i \quad (1)$$

where s_i denotes the market shares of k largest firms in the industry. The major advantage of CR is its ease of calculation. However, its core limitation is that it fails to make use of all the data on the market share of all market participants (Jansen and Haan, 2003). Gini coefficient; this represents the degree of distribution inequality; in this case, an inequality level of market share distribution is assessed. Using the following formula below:

$$\text{Gini Coefficient (G)} = \frac{1}{2n^2y} = \sum_{i=1}^n \sum_{j=1}^n |y_i - y_j| \quad (2)$$

where G is the Gini coefficient, n is the total number of market participants, y is the average value of the observed indicator, y_i and y_j are observed values of participants i and j (Litchfield, 1999). Using Gini coefficient in the definition above, the value of GC ranges between 0 and 1, while zero value represents an equal distribution of market shares, the value of one indicates a pure monopoly market of a single participant 100% market domination. Herfindahl-Hirschmann Index (HHI); The index is highly preferred in the anti-monopolistic process in the European Union and United States (Strohe, 2009). It is expressed as the sum of squares of the market shares of market participants within the observed industry (market shares may be calculated based on assets, capital, etc.): Where s_i is market shares of n participants in the industry. When the value of HHI is less than 1,000 (i.e. less than 0.1), it implies no concentration in the industry; the HHI value between 1,000 and 1,800 (i.e. between 0.1 and 0.18) shows moderate concentration, while more than 1,800 HHI value (i.e. more than 0.18) is a characteristic of a highly concentrated sector (Macit, 2012).

On the empirical note, a few studies have attempted investigating the relationship between market structure and bank profitability (see Short, 1979; Molyneux and Thornton, 1992; Demirgüç-Kunt and Huizinga, 1999; Goaid, 2001; Abreu and Mendes, 2002; Chirwa, 2003; Babalola, 2012; Behname, 2012; Obamuyi, 2013; Osuagwu, 2014; Bolanwa and Obembe, 2016w), but only a few of them have focused mainly on the interrelationship among market structure, concentration and bank performance measured by profitability. To start with, Short (1979) examined a sample of 60 banks in the USA, Canada, and Japan. His findings revealed a positive link between concentration and profitability in the long term, but could not confirm it over the short term. At the same time, he states that comparatively huge changes in concentration indicate that even though profit will grow, it will do so more and more slowly. Chirwa (2003) investigated the relationship between market structure and bank performance in Malawi using

time-series data from 1970 to 1994. The results of his co-integration and error correction techniques supported the traditional collision model which impressed a long-run positive connection between concentration and industry's performance. Aburime (2008), employing panel data from 1980-2006, examined the determinants of profitability in the banking industry. His finding revealed that financial structures are insignificant factors of bank profitability. However, he found that macro-economic variables; such as the real rate of interest, inflation rate, monetary policy, and exchange rate system significantly determine bank profitability. In the same vein, the work of Oladele, Sulaimon, and Akeke (2012) showed that bank performance significantly responds to operating expense and equity ratio in Nigeria. Furthermore, Babalola (2012) in his model sought to explore the determinants of profitability in Nigeria. He found that, in the short run, capital adequacy ratio determines bank profitability. Also, Obamuyi (2013) used panel data of 20 banks from 2006 to 2012 to examine the impact of bank capital, size, expense management, interest income, and the economic situation on banks' profitability in Nigeria. His findings showed a positive relationship between these variables and the banks' performance in Nigeria. Equally, Adeusi, *et al.* (2014), with the instrumentality of panel data of fourteen banks from 2000 to 2013, investigated the factors affecting profitability in Nigeria banks. He proxied profitability with return on assets (ROA) and observed that asset quality, management efficiency, and economic growth affect banks' profitability. Moreover, Osuagwu (2014) in his study on selected banks in Nigeria revealed that credit risk determines bank profitability. Overall, the review showed that only a few empirical researches on concentration and profitability exist in the banking industry in Nigeria with less emphasis on the banking structure. It is against this backdrop that this study ventured to assess the effect of banking structure and concentration on its performance using error correction modeling with time-series data and thus enrich the body of knowledge

METHODOLOGY

This study employed secondary data from 2008-2017, which were sourced from the Nigeria stock exchange Annual report, Statistical Bulletin of the Central Bank of Nigeria (CBN), Fact Book and annual report and accounts for money deposit banks in Nigeria. To capture the interrelationship among the variables of the model, co-integration, and error correction mechanisms (ECM) were employed. Thus, we use the Average Return on Capital Employed (ROCE) as a proxy for bank profitability, which is our dependent variable. However, the independent variables of the model include:

Average Texas ratio (TR), Average Earnings Power Ratio (EPR), Number of bank branches (NOB), and Loan-adjusted Concentration Ratio (CRL). The focal variable is the concentration ratio (CR) which is measured as the Bank concentration index of the highest four (CR_4). Total Loans were used for the measurement. CR_k is computed as the sum of top k th firms' market shares and summing only the market shares of the k biggest firms in the industry. It takes the form:

Where S_i is the ratio of the Loan of the first-four largest banks to total Loan made available in the industry. CR_k is a relatively strong measure because it considered the structure of the market to the shares of a few dominating firms in the market.

This index is premised on the reasoning that few larger firms dominate the market behavior of a market. The index is very useful to assess the market influence of a few dominating firms in the industry. In consonance with the market power hypothesis, a positive link is expected between market concentration and bank profitability. In this study, three independent variables are introduced. They are; risk (Texas ratio) measured by Non-performing loan/ (Tangible Capital employed+ Loan Loss Provision), Earnings Power Ratio (EPR) measured by Gross income/ Average Total Asset, and the bank network measured by Number of Registered bank branches (NOB). The prior view of the study is that there exists a positive relationship between a bank's network and banks' performance measured by banks' profitability. Furthermore, the banking business is opened to various dimensions of risk (credit risk). Thus, the traditional risk-return proposition suggests a nonnegative nexus between risk and profitability. Also, it is a priori expected that TR and performance be positively related. The EPR represents the income realized per naira asset used, that is, the production efficiency of naira asset employed. A positive relationship is anticipated between bank profitability (performance) and EPR. Thus the model for the study is therefore specified as below:

$$HHI = \sum_{i=1}^n S_i^2 \quad (5)$$

To examine the long-run relationship between market concentration and bank profitability, the following econometric models is specified:

$$\Delta ROCE_t = \phi_0 + \phi_1 \Delta CRL_t + \phi_2 \Delta TR_t + \phi_3 \Delta EPR_t + \phi_4 \Delta NOB_t + \mu_t$$

Where Δ represents the first difference and μ_t is the error

To capture both the short-run dynamics between the time series variables of interest and their corresponding long-run Equilibrium relations, the following models were to be estimated

$$\Delta ROCE_t = \phi_0 + \sum_{i=1}^k \Pi_i \Delta ROCE_{t-i} + \phi_1 \sum_{i=1}^k \Delta CRL_{t-i} + \phi_2 \sum_{i=1}^k \Delta TR_{t-i} + \phi_3 \sum_{i=1}^k \Delta EPR_{t-i} + \phi_4 \sum_{i=1}^k \Delta NOB_{t-i} + \psi ECM + \varepsilon_t$$

where the ECM is the error correction term. The coefficient of the error correction term measures the

the pace of adjustment toward the long-run equation and is expected to be negative. It is expected that ϕ_1, ϕ_2, ϕ_3 and $\phi_4 > 0$.

EMPIRICAL RESULTS AND DISCUSSION

This section investigates the effect of market concentration on bank performance in Nigeria (2008-2017) using co-integration and error correction techniques to determine the existing relationship between the dependent and independent variables.

Statistical Properties of the Data Series: The unit root test results were reported in Table 1 after using the Augmented Dickey-Fuller (ADF) with intercept only. The decision rule is that the ADF test statistic value must be greater than the Mackinnon critical value at 5% (in absolute value).

From Table 1, it could be observed that all the variables were non-stationary at the level because they had their ADF statistics less than the critical value at 5%. This led to the testing for stationarity at first difference. However, all the variables of the model are found to be stationary at first difference. That is, integrated of order one I (1) because they have their respective ADF statistics greater than the critical value at 5%. The stationarity status of the variables of the model indicates a long-run relationship among the variables.

value of -5.832963 is greater than the critical value of -3.01236 and -3.7880 (in absolute term) at 5% and 1% significance levels respectively.

Short-Run Error Correction Resolution of the Model: The technique adopted is derived parsimonious error correction model by adopting the general to specific (GTS) methodology. The lag period has been consciously chosen to enable a robust identification of the main dynamic patterns in the models and to avoid unwarranted restriction that a too short lag length could generate.

Table 1. Augmented Dickey-Fuller test results for the series of variables

Variables	ADF test at Level		ADF test at First Differences		Remarks
	ADF statistic	Critical Value(at 5%)	ADF statistic	Critical Value (at 5%)	
CRL	-0.4484	-3.0124	-3.313	-3.0207	I(1)
EPR	-2.2223	-3.0123	-6.491	-3.0207	I(1)
NOB	-1.2764	-3.0124	-4.265	-3.0207	I(1)
ROCE	-2.7426	-3.0124	-5.883	-3.0207	I(1)
TR	-1.2274	-3.0124	-3.026	-3.0207	I(1)

Table 2. Co-integration residual stationary test result

Null Hypothesis: RESIDUAL has a unit root		Critical Values
ADF Statistic	P-Value*	
-5.8329630.00011% level		-3.78803
5% level		-3.01236
10% level		-2.64612

Table 3. Parsimonious error correction Modeling by OLS Dependent Variable: D(ROCE)

Variables	Coefficient	std Error	t-statistic	P-Value
C	-0.192421	0.828581	-0.232229	0.8216
D(CRL)	-19.797	9.154467	-2.16255	0.0588***
D(TR)	-1.920479	1.969354	-0.975182	0.355
D(EPR)	0.451761	0.249291	1.812188	0.1034
D(NOB)	0.137134	0.052277	2.623232	0.0277**
D(CRL(-1),2)	-11.44457	8.321756	-1.375259	0.2023
D(CRL(-2),2)	-14.76922	7.87774	-1.874805	0.0936***
D(NOB(-1),2)	-0.122153	0.034923	-3.497814	0.0067*
ECM(-1)	-0.839268	0.278392	-3.014702	0.0146**
Akai ke info crit.	5.260026	<i>R-squared</i>	0.91207	DW 1.786455
Schwarz crit.	5.705212	<i>Adjusted R-squared</i>	0.83391	
Hannan-Q	5.321411	<i>F-statistic</i>	11.66928	
Mean dep. Var.	-0.601852	<i>Prob(F-statistic)</i>	0.000634	
Std dep. Var	7.065764			

, * significant at 1%, 5%, 10%

That is existence cointegration in the long run. We, therefore, move on for a cointegration test.

Test for Co-integration: Arising from the need to integrate short-run dynamics with a long-run equilibrium through the inclusion of an error correction mechanism (ECM) in the dynamic formulation of the model for estimation, Co-integration technique was employed. This also helped explore the long-run relationship status of the variables included in the estimated model. Possible cointegration among these variables is investigated by employing the Engle and Granger two – steps method. The ECM will help to derive both short-run and long-run features of the model which could have been impossible with other estimation techniques except lags are forced into them (Iganiga and Unemhilin, 2011). Co-integration provides the stationarity of the residuals derived from running a static regression at levels of the regressors (independent variables) on the regressed (dependent variables) (Iganiga and Unemhilin, 2011). Table 2 reports the co-integration test conducted. The result of ADF co-integration tests presented indicates that the ADF coefficient is significant at a 5% level of significance. The ADF test statistic with the

The interpretation of an over-parameterized model appears difficult to interpret; this has thus informed its reduction to a parsimonious model. We carried out the reduction by eliminating the variables with insignificant coefficients in succession given the imposition on those variables that are zero coefficient as they take low t-statistics or high probability values. The criterion of maximum R-squared and Akaike criterion was also applied in selecting the parsimonious model.

Findings and Implications: The output of the parsimonious model of the impact of industry concentration on bank performance measured by profitability is tabulated in Table 3. The result indicates a negative relationship between two-years lagged market concentration (D(CRL(-2),2)) and the present value of current bank profitability. In the same vein, the one-year period lagged concentration ratio (D(CRL(-1),2)) is negatively related to bank profitability. The tabulated results show that a unit increase in 11.4, the market concentration would cause a significant repressing effect of about 11.45 units on banks' profitability on the average. It should be noted that this impact is even instantaneous because the current value of market concentration is also significant (-19.797, p-value <0.1). It

follows that if the industry structure goes into collusion or monopoly, performance would reduce (Behname, 2012). This result agrees with Garcia-Herrera (1997), Chortareas *et al* (2010) and Behname (2012) who have obtained similar results, but the result negates the findings of Chirwa (2003) who employed co-integration and ECM to investigate the link between structure and bank performance in Malawi with the aid of time series data between 1970- 1994. However, our finding is contrary to the apriori expectation. The reason for this result is not too difficult to explain. First, it has been argued in the literature that economic fluctuation could alter the interplay of demand and supply and thus influence business performances (Chang 2013). Furthermore, the economic boom has been found to facilitate performance (Chang 2013; Chen & Chiu 2014; Chang 2013). Towing this reasoning, we could infer that the oil shock-induced economic recession in Nigeria within the period of this study could interfere with the findings of this study. Further studies on this topic should take this factor into cognizance. Secondly, government policies is another determinant of structure, conduct and industry performance (Waldman & Jensen 2014; Pope & Ma 2008; Njegomir *et al.* 2011). Hence, it is not unlikely that the strict financial measures taken by the government to stem the wave of the shock interfered with our results. It is very important to note that one year and two lag variables of TR had been eliminated in the process of model reducing due to the insignificant nature of the coefficients. The current value of TR is negative and also insignificant. It means that in the case of the Nigerian banking market, a negative but insignificant relationship exists between credit risk (D(TR)) and banking profitability (D(ROCE)). If credit risk increases by 1 unit, banking performance will fall by 1.92 units. The NOB variable measures the bank branch network of Nigerian banks. The coefficient of this variable is positive, and correctly signed; that is the wider the networks the higher the performance. The coefficient of EPR is also positive; EPR measures the revenue strength of Nigerian Banks. The result shows that 1 unit growth in EPR means that banks' performance will improve by 0.45 unit on average.

Statistically, in terms of reliability, the results show that the indicator of the overall goodness of fit of the model (R-squared) has a value of 0.91. This suggests that the estimated model explained about 91% of the systemic variation in the dependent variable as explained by the independent variables of our model. In the same vein, the Adjusted R-squared with the value of 0.83391 (i.e 83%) shows that the result of R-squared is not overstated. The coefficient of error correction terms (ECM) that measures the speed of adjustment is correctly signed and also significant (-0.839, p-value < 0.01). Its magnitude of 0.839 implies that the present value of bank performance (ROCE) adjusted rapidly to changes in the explanatory variables. And that about 84 percent of the disequilibrium in the dependent variable (banking profitability) is reverted in each period. By implication, this implies that, to a large extent, the bank performance measured by profitability is determined endogenously in Nigeria.

Conclusion and Recommendation

This study examined Structure, Conduct, and Performance paradigm in the context of the Nigerian banking market with the aid of time-series data from the year 2008 -2017. Econometric modeling within the contest of ECM was employed to evaluate the data. The overall results rejected the

market power hypothesis (simply called collusion hypothesis) which states that an increase in market concentration improves performance in an industry. The results negate our expectations of increased market power that could have possibly come from the banks' collusion and a corresponding growth in the level of concentration which could, in turn, increase bank profitability. By implication, the policies which target reducing barriers to competition would be expected to benefit the banking industry with no harmful effect on consumers. This study used only one country data (Nigeria) as a case study. From this basis, future works can be directed at the dynamic link between structure and bank profitability. Impact of the banking structure on other sectors of the economy can also be investigated.

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