Bank Consolidation and Deregulation Effects on the Level of Competition in the Nigerian Banking Industry

by

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Abstract: The study was to determine the effect of deregulation and consolidation on the level of competition in the Nigerian banking industry. The study employed a Multiple OLS Regression analysis to test the effect of the independent variables on the dependent variable, before which a pre-test for Stationarity was employed (ADF test) and a Johenson Cointegration Test. Having established the fact from the results that there exists a long run relationship, the study confirms the fact that a more concentrated industry with few banks resulting from consolidation via merger and acquisition, does bring about economics of scale, innovation and heighten competition in the banking industry. A similar effect was also noticed in the deregulation/liberalization impact as a more liberalized (or deregulated) financial system will bring about heighten competition, positive interest rates, and higher savings; though it was found to be insignificant.

Key words: Bank Competition, Interest Rate Spread, Deregulation, Consolidation, Regression.
JEL classification: G21

1 Introduction

Competition is a key driver in ensuring that consumers not only get optimal value for their money, but guarantees efficiency and innovation. This however depends on the manyness or fewness of firms in the industry; as fewness of sellers creates an opportunity for collusion, singleness; a monopolistic industry, and lastly, the more (manyness); the merrier. For these, many countries have adopted financial deregulation policies as such heightens bank competition. In this regard is a second policy that reduces the number of firms in industry, to creating fewer stronger firms; such is Consolidation. In as much as consolidation reduces(s) the number of banks in a sector on the justification of creating few stronger firms, its effect on the level of competition is ambiguous. The shift from a regulated system to a more deregulated one is geared on the notion and gains obtainable from a competitive economy. Theoretically and empirically put, in competitive market structure where prices are left for the market forces of demand and supply, featured with no price setter, homogeneity of goods/product/services, free entry and exit and manyness of sellers, all avail the opportunity for bargain and improved efficiency in production, service delivery and allocation of resources to some extent depends on the number of operating firms. With these in mind, many countries have adopted policies designed to open-up and freeing its key sectors (relaxing direct regulations and entry barriers); such is the Bank Deregulation policies. Alongside this, is another policy whose move induces a reduction in the number of firms in the industry, thereby creating fewer stronger firms in this case banks; such is the Recapitalization-Consolidation policies. In as much as consolidation reduces(s) the number of firms (banks) in a sector on the justification of creating few stronger firms, its effect on the level of competition is ambiguous. As the Concentration School of thought, advocates that fewness of banks (i.e consolidation, via merger and acquisition) provides a stronger financial market, but not many little banks; that poses problem for broad supervision, and weak base to support large development project. On the other hand, the Decentralization School of thought that considers fewness as a threat to the financial stability of the industry, emphasises that - the coming together of sick components, does not sum to a healthy entity; that is the consolidation of many weak banks in many cases only result to few weak mega banks as the systematic risks (of poor corporate governance, illiquidity, unethical practices, credit bias, non-performing loans, toxic portfolio, etc) in the many
components persist after consolidated creation of few banks. Especially when a shrink in the number of firms is not market induced (i.e. Nigeria’s consolidation forcing M&A).

On deregulation policy, financial deregulation (otherwise referred to as financial liberalization) is a programme of changes in the direction or moving towards a free market economy. This normally includes the reduction of direct controls on both internal and international transactions and a shift towards relying on the price mechanism to coordinate economic activities. In such a programme, less use is made of licences, permits and price controls, and there is more reliance on prices to clear markets. It also involves a shift away from exchange control and multiple exchange rates, towards a convertible currency. The extent to which an economy is controlled can vary greatly. **Deregulation is a matter of degree, and does not imply a shift to total laissez-faire.** It entails the removal or relaxation of regulations affecting the type of business financial firms may undertake, the type of firms permitted to deal in the particular markets, or the terms on which dealing is allowed. Regulations which have been relaxed include controls on interest rates at which banks can lend or borrow, controls on operations by banks outside their country of registration and restrictions on the types of business particular financial institutions can transact, direct credit abolition and exchange rate deregulation (Timothy, et al, 2012). McKinnon and Shaw (1973) advocate liberalization as a tool in propelling financial development. As freeing the financial sector causes a positive real interest rate, increased fund mobilization, and efficient allocation, all of which implicitly are as a result of competition and the innovation that comes with it. This gain however, will be somewhat sabotaged if the decentralization school of thought is right. As a shrink in number of firms, does not necessarily reduce infectious systemic risk and unethical governance, but definitely tells on industrial competition negatively.

2 The problem

The deregulation of interest rate, deregulation of capital flow, allowing autonomous bureau de’ change, abolition of selective credit, and other dimensions of deregulation provide customers the opportunity of bargain {i.e. if a Borrower Investor is in need of credit loan and approaches Bank “A”, whose lending rate is too high after bargain, he can visit Bank “B” to bargain for a lower rate compared to “A”. If Bank B’s rate is cheaper but unsatisfactory to the borrower, he can visit Bank “C”, “D”, “E”, and then after “n” Bank” until equilibrium at his believed cheapest rate – near real market rate of interest is attained. The same is obtainable in search of a bank with higher deposit rate to save. These gains however depend on the number of operating firms and their behaviour; competitive, oligopolistic or monopolistic}. Overtime, this opportunity {that turns power} of possible customer shift, forces banks (firms) to innovative customer attracting practices; higher deposit rate (that encourage savings mobilization) and lower lending rate (than encourages credit demand, need for increased monitoring and screening, investment and economic growth) to increase market share relative to competitor, thereby reducing the aggregate lending and deposit rates (reduced spread in interest rates). To this end, data obtained from the from the CBN (2010) indicates a widening of interest rate spread especially after the consolidation exercise of 2004; suggesting poor or absence of competition; forcing us to question if consolidation reduces competition, causing a collusion of banks, or is the deregulation not significant enough cause a penetrating competition in a consolidated industry? Has the number of bank anything to do with the level of competition? Or may be both economic and financial regulatory factors are responsible for the level of competition in the Nigeria banking industry? The objective of this paper is to determine the main and interactive effect of deregulation and consolidation on the level of competition in the Nigerian banking industry

3 Background to deregulation and bank consolidation in Nigeria

The bank deregulation in Nigeria started in 1987. Consequently, the number of banking institutions (DMBs and Merchant banks) increased from 41 in 1986 to 50 in 1987, 119 in 1993, dropped to 115 in 1996. However, when prudential measures such as the increase in the requirement in bank paid-up capital in 1989 and the reform of their accounting procedure (1990) appeared insufficient to restrain the immoderation of the financial sector, government placed total embargo on the bank licensing in 1991 to halt this growth. As profitability of investment and access to credit
and foreign exchange were among the major motives for bank ownership; the new banks were generally small and undercapitalized a situation that later led to an upward review of banks minimum operating capital in 2004. The embargo placed on bank licensing is yet to be lifted. Between 1998 and 2004, the number of banks in operation ranged between 89 and 90. However by 2005, the number plummeted to 25, then 24 in 2009, following the increased bank capital base of N25 billion and subsequent consolidation exercise.

The competitiveness that resulted from the entry of new banks and the deregulation of interest rate brought about sharp rise in nominal deposit and lending rates, from 3% and 7% to 14% and 17.5% that is a growth rate of 366.7% and 150% respectively from 1970 to 1987. The increase was however moderated by the occasional reimposition of interest rate ceilings. Nevertheless, the average deposit and lending rates doubled in the third year of the reform. Note that, financial sector deregulation is expected to narrow the spread between deposit and lending rates as a result of competition that was expected to ensure in the financial sector, following the inflow of new entry and market determined interest rates. The interest rate spread (lending–deposit rate margins) has been dramatically wide in Nigeria in the post-reform period than in the pre-reform era.

The prevalence of very high lending rates and systematic increase in the lending-deposit rate margins/spread in the post reforms period is essentially harmful to savings and economic growth. Under the deregulation reform programmes, an initial increase in the spread between lending and deposit rate was expected, as banks needed time to adjust their cost

Figure 1: Total Number of Banks 1970-2009.

Source: Author’s Computation, Data sourced from the CBN Bulletins

Figure 2: Interest Rate Spread 1970 – 2009.

Source: Author’s Computation.
structure during the changing environment; the competitiveness that resulted as new banks entered into the industry and the liberalization of interest rates brought about sharp rise in nominal deposit and lending rates. The increase was however moderated by occasional reimposition of interest rate ceiling and embargo on bank licensing. Nevertheless, the average deposit and lending rates doubled in the third year of the reform. Surprisingly, the competition for deposits which drove nominal interest rates up could not ensure a cheaper cost of intermediation. The nominal interest rate spread rather worsened (implied by a widening in the spread as depicted in Fig 2). This is an indication that the reform did not improve the availability of loanable funds. The spread was expected to narrow as more efficient business practices were embraced sequent to increasing competition and as credit demand stabilised. But more than a decade after reforms were started, the spread between the two interest rates continued to widen in Nigeria. The problem of continual increase in lending rates and low deposit rates during the post reform period is one of the most attention-grabbing effects of financial sector reforms in Nigeria. For instance, from the graph, the spread widened by over 7.59 percentage points on the average from 2.51 per cent during the pre-SAP deregulation reform period (1970-1986) to 10.1 per cent in the post-SAP deregulation reform period (1987-2010), and widened even further after consolidation by 13.9%.

Higher spread was one of the strategies employed by the banks for survival; which can be checkmated only by being seldom regulation by the Central Bank of Nigeria. The impact of the wide spread in interest rates on investment and growth, which is majorly resulted by a stagnant savings deposit rate and an increasing lending rate, causes investors to seek alternative sources (such as corporative and other informally credit units) where investible credit loans and advances are cheaper. Such credit constraint not only limits investment productivity (especially in the real sector) but also limits the overall level of output in the economy. The savings deposit rate, which on the other hand, is suppose to encourage savings habit of the populace in the formal sector, seem not to serve this purpose as financial institutions exploit the disadvantage of the depositor’s lack of investment alternatives, as a result of the unfriendly (and unsecured) investable economic environment.

### 4 Consolidation

Consolidation is simply another way of saying survival of the fittest that is to say a bigger, more efficient, better-capitalized, more skilled industry. Consolidation is part of the natural evolution of industries. It is primary driven by:

- Business motives and/or Market Forces
- Regulatory interventions

Prior to 1992, the minimum paid up capital requirement for banks in Nigeria was N12 million for merchant banks and N20 million for commercial banks. A review that year moved the requirements to N40 and 50 million, respectively. This level lasted till 1997 when a uniform N500 million minimum capital was introduced. The reason for discontinuing the dichotomy was to allow for a level playing field and the realization that there was no real difference between the capital requirements of the two categories. It was also to prepare the system for the introduction of universal banking. In 2000, the minimum capital was moved to N1 billion for new banks while existing banks were expected to meet this level by December 2002.

Total N2 billion minimum paid up capital was introduced for new banks in 2001 while existing banks were given until December 2004 to comply. The reasons for these adjustments include:

- Increasing cost of IT and other infrastructure
- Inflation and increasing interest rates
- Depreciation of the national currency
- Strengthening the operational capacity of deposit money banks
- Minimize the risk of redress

There was also the need to curb the spate of requests for licenses which in many cases were not backed with any serious intention. The absorptive capacity of the system was also an issue, i.e. things like the executive capacity to run the banks, supervisory resources, the cutthroat competition that was breeding malpractices, etc. Consequently on July 6, 2004, the Central Bank of Nigeria (CBN) made a policy pronouncement.

The highlight was the increment of the earlier N2 billion to N25 billion with full compliance deadline fixed for the end of the year. The rationale as indicated is that most banks in Nigeria have a capital base of less than US$10 million or about N1.3 billion and that the largest bank in Nigeria has a capital base of about
US$298 million compared to US$526 million for the smallest bank in Malaysia. Further reasoning include that globally, size has become an ingredient for success. An enhanced capital-base, all things being equal is expected to confer competitive edge on a bank. It would enable the bank acquire relevant technology, engage high quality personnel and absorb shock. It would also position the bank to offer better and value-added services while increasing its earning capacity. Furthermore, consolidation increases the potential of banks to compete effectively at the national, regional and global levels. Another issue related to the small size of Nigerian banks is the high cost of intermediation epitomized by the wide spread between deposit and lending rates. It would be recalled that the desire of the government to have a single digit lending rate has remained a mirage due mainly to the high cost of intermediation. However these supposed gains emanating or hoped for from consolidation of the banking industry, to what extent has it affected the level of competition as indicative in the aggregate market prices of interest rates? Has consolidation of banks made them not only bigger in size but instigating the need for efficiency in operation, thereby retaining and increasing its customer base by reviewing their individual interest rate charges relative to other now bigger competing mega banks, so that in the long run, in the pursuit of larger economics of scales that emits from consolidation, banking efficiency can be improved upon to surpass competitors and on the aggregate, the economy enjoys a narrowed interest rate spread. Especially when the liberty of deregulation still lingers in the industry? Or is consolidation and deregulation in the Nigerian banking sector just a sham; building on the premise that the banks are all political cum financial allies; so oligopolistically colluded that gains from such policies are unattainable, especially when reforms in the industry are so inconsistent that one could hardly point to any reform that have lived to full maturity and its benefit ripened reaped?

5 The literature review

Some theoretical arguments and country comparisons suggest that a less concentrated banking sector with many small banks is more prone to financial crises than a concentrated banking sector with a few large banks (Allen and Gale, 2000, 2003). First, proponents of the “concentration-stability” view hold that large banks can diversify better so that banking systems characterized by a few large banks will be less fragile than banking systems with many small banks. (Diamond, 1984) Second, concentrated banking systems may enhance profits and therefore lower bank fragility. High profits provide a “buffer” against adverse shocks and increase the franchise value of the bank, reducing incentives for bank owners to take excessive risk (Hellmann, Murdoch, and Stiglitz, 2000). Third, some hold that a few large banks are easier to monitor than many small banks, so that corporate control of banks will be more effective and the risks of contagion less pronounced in a concentrated banking system. According to Allen and Gale (2000), the U.S., with its large number of small banks, supports this “concentration-stability” view since it has had a history of much greater financial instability than the U.K or Canada, where the banking sector is dominated by fewer large banks. An opposing view is that a more concentrated banking structure enhances bank fragility. First, advocates of the “concentration-fragility” view note that large banks frequently receive subsidies through implicit “too big to fail” policies. (Stightz, 1972). This greater subsidy for large banks may in turn intensify risk-taking incentives, increasing the fragility of concentrated banking systems (Boyd and Runkle, 1992). Second, proponents of the concentration-fragility view would disagree with the proposition that a few large banks are easier to monitor than many small banks. If size is positively correlated with complexity, then large banks may be more opaque than small banks, which would tend to produce a positive relationship between concentration and fragility. Finally, Boyd, and De Nicolo (2003) stress that banks with greater market power tend to charge higher interest rates to firms, which induces firms to assume greater risk. If concentration is positively associated with banks having market power, this model predicts a positive relationship between concentration and bank fragility.

The study by Berger et al (1999), suggest that bank consolidations do not significantly improve the performance and efficiency of the participant banks. In contrast, Berger and Mester (1997), Berger and Humphrey (1992), Allen and Rai (1996) and Molyneux et al. (1996) indicate that there is a substantial potential for efficiency improvements from mergers of banks. However, the prospects for
scale efficiency gains appear to be greater in the 1990s than in the 1980s. This finding is ascribed to technological progress, regulatory changes and the beneficial effect of lower interest rates (Berger et al., 1999).

Case studies evidences suggest that the cost efficiency effects of mergers and acquisition may depend on the motivation behind the mergers and the consolidation process (Rhoades, 1998). Haynes and Thompson (1999) explore the productivity effects of acquisitions for a panel of 93 UK building societies over the period 1981-1993. In contrast to much of the existing bank merger literature, the results indicate significant and substantial productivity gains following acquisition. These gains were observed not to be the result of economies of scale but are found to be consistent with a merger process in which assets are transferred to the control of more productive managements. Similarly, Resti (1998) reports increased levels of efficiency for Italian bank mergers and acquisition, especially when the deals involved relatively small banks with considerable market overlap. Sawada and Okazaki (2004) investigate the effects of policy-promoted consolidation on the stability of the financial system using the data on prewar Japan. It was confirmed that policy-promoted consolidations mitigated the financial crisis by enhancing the ability of the bank to collect deposits, under the condition that the financial system was exposed to serious negative shocks. However, policy-promoted consolidations also had negative aspects as they were accompanied by large organizational costs and decreased bank profitability.

On deregulation, Rahila et al (2010), that examined the long run and short run association among Investment, Savings, Real Interest rate on Bank Deposits and Bank Credit to the Private sector, when exposed to Financial deregulation in Pakistan, (which they measure using a dummy variable, 1- to capture the presence of liberalization and 0- for no liberalization) on key macroeconomic variables in Pakistan for the period 1973 to 2007. They applied an ARDL-Bound Testing Approach for co-integration of annual time series data. To test the order of the variables, DF-GLS and NG-Perron Tests were employed. Their result showed that private investment is positively affected by savings, real interest rate on bank deposits, bank credit to private sector and public investment in the long run for a developing country like Pakistan. The coefficient of real rate of deposit, though positive and statistically significant, but its value is very small (0.005).

Nevertheless, its positive sign supports McKinnon's complementarity hypothesis, that high interest on deposit promotes the capital formation (investment) by increasing the supply of credit through savings (McKinnon-Shaw, 1973). However, their use of such traditional dummy of extremes (0 and 1) neglects the fact that financial deregulation in reality is a phenomenon of degree, whose effect is better measured on a scale level to capture the dimensional changes of deregulation policies that reflects its degree of liberality. Bandiera et al (2002) constructed an index of financial deregulation on the basis of eight different components: interest rates, pro-competition measures, reserve requirements, direct credit, bank ownership, prudential regulation, securities market deregulation and capital account deregulation. Their data spans from 1970 to 1994 for Chile, Ghana, Indonesia, Korea, Malaysia, Mexico, Turkey and Zimbabwe. Among the key findings of their estimation of their benchmark model is that: there is no evidence of positive effect of the real interest rate on savings. In most cases the relationship is negative and significantly so in the case of Ghana and Indonesia. Furthermore, the effects of the financial deregulation index on savings are mixed: negative and significant in Korea and Mexico, positive and significant in Turkey and Ghana. The long run impact of deregulation is sizeable. Corresponding to the realized change in the index, the estimated model indicated a permanent decline in the savings rate of 12% and 6% in Korea and Mexico, and a rise of 13% and 6% in Turkey and Ghana. Excluding the interest rate and inflation and adjusting for capital gains and losses leave the results unchanged. Their panel results indicate that a likelihood ratio test that imposes the equality of coefficients in the pre and post deregulation periods can be rejected at conventional levels. The real interest rate has a significant and positive effect and the aggregate index of deregulation has a negative effect on savings. The effect of the aggregate financial deregulation index (which is significantly negative), is large to offset the estimated positive effect of the increases in real interest rates.

**Bank Competition Literature:** Given the special attributes of banking industry, the theory of financial intermediation indicates measuring the both quantity output and quality of banks is not as straightforward as for non-financial firms. In addition to the intangible nature of
banking output, it is difficult to account for quality in banking service. Heffernan (1996), Klein (1971) and Clark (1988) discussed the relevant concepts of bank output and input. Despite the importance of commercial banking as a major financial intermediary, there has been little consensus as to what constitutes a workable and productive theory of the banking firm. Klein (1971) claims that neo-classical microeconomic analysis is rarely used to explain bank behaviour, primarily because there is so little agreement concerning even the most fundamental concepts. In the face of conceptual difficulties in drawing the analogy between a bank and the typical firm of neo-classical analysis.

Among various competition models in banking, Gehrig (1996) and Matutes and Vives (1996; 2000) included monopolistic competition with horizontal and vertical product differentiation, where the equivalent quality parameter is the degree of branching. However, the weakness of the monopolistic competition approach is the lack of empirical evidence, given the imperfect nature of the industry. There are information gaps among borrowers and lenders and imperfect information lies at the centre of banking sector dynamics. Freixas and Rochet (1997) explain that intermediaries in the brokerage market, including banking, can affect their trading probabilities by establishing an information and communication network. As communication possibilities across potential traders are imperfect, Freixas and Rochet (1997) claim that, several firms, not one, will offer similar or identical intermediary services. Gehrig (1996) shows that the structure of financial markets is usually fairly concentrated with a few large firms and monopolistic competition market conditions will not be present. On the other hand, Klein (1971) assumed that banks maximise profits in the course of the intermediation activity and thus, the microeconomic analysis of banks has been influenced by industrial organisation theory. This led to the development of banking competition models and to empirical studies based on methods developed for industrial economics. Klein (1971) and Monti (1972) considered a bank as a firm maximising its net present value of assets and established a landmark model of banking.

Among other competition models in banking, Repullo (1995) and Chiappori et al. (1995) applied horizontal differentiation to banking. In these models, the main difference between banks and non-financial firms is that banks compete in two markets instead of one, i.e. deposits and loans markets. However, they assume that under perfectly competitive interbank market conditions complete independence of the two activities of the bank can be obtained. The predictions of these models are that banking industries should be fragmented, and market shares should be symmetrically distributed. Gehrig (1996) and Matutes and Vives (1996; 2000), introduce network externalities to explain how asymmetric configurations in market share could arise in banking. This asymmetric information paradigm has emerged as a mainstream approach for recent banking analyses. The traditional approach to early empirical studies of banking was based on the structure-conduct-performance (SCP) paradigm. Bain (1951) supposed a one-way linear relationship of causality, which runs from structure (the level of concentration) to conduct (the degree of collusion or competition), and then to performance (profitability). Therefore the structure of an industry is important to the understanding of its performance. However, the application of SCP paradigm has been subject to considerable criticism as it neglected feedback. Cowling (1976) suggests the structure-performance relationship be a recursive system of feedback with substantial lags. Berger (1995) also questioned the results obtained following the SCP paradigm. Despite the criticism, the SCP paradigm provided the foundation for the study of market structure. Kolari and Zardkoohi (1987) and Clark (1988) explained the concentration in banking industry with economies of scale and scope. Economies of scale in banking and financial intermediation allow banks to exercise market power or to preempt potential rivals’ entry. Although banking systems tend to be quite concentrated, in some developed countries, the United States shows a fragmented structure. However, this fragmentation exists primarily as a result of regulation on inter-state branching designed to deal with their concern about financial power.

Game theory provides another useful approach for analysing banking competition. When banks are to maximise their profits under SCP paradigm, the market structure can be investigated under a two stage game theoretic model. Banks can play two different games, competing in prices or quantities. As an example of price competition, banks enter the market with sunk costs. The exogenous sunk cost such as capital requirement to open a bank is a fixed set-up cost as it is fixed by an entry
regulation and only varies in the presence of change in regulation. The endogenous sunk cost of branching is a variable set-up cost, which is considered to be a parameter for an escalation mechanism in vertical product differentiation in banking.

A similar application to internet bank networks is feasible. Chiappori et al. (1995) derived the equilibrium number of banks under various regulatory conditions and suggested the equilibrium number of banks under regulation is larger than that under free market condition but none of them is socially optimal. Cerasi et al. (2002) also looked at the impact of deregulation on concentration and branch networks in European banking. Since deregulation reduces profits for a given branching network, fewer firms find it profitable to enter the industry and therefore the degree of concentration rises. On the other hand when the banks collude, they establish a smaller network compared with competition as opening new branches damages rivals by stealing their clients. By coordination, they will avoid this damage. However, her empirical analysis shows the weakness in explaining the feedback process of structure-performance relation.

6 Theoretical build-up

The theory for the study will be built on the Mckinnon-Shaw Hypothesis “Complimentary Hypothesis”, as it has been implemented for testing the effect of deregulation and liberalization of the financial system (Ogwumike and Ofoegbu, 2012). However, to attain our objective, we will be augmenting with a Consolidation Variable. The Complimentary Hypothesis emphasises the need for a deregulated financial system; a complementarily between accumulated savings and credit allocation; competition and savings, then credit allocation. Our model incorporates the consolidation effect and the number of banks for a holistic capture of set objectives. The complementarily hypothesis of McKinnon provides a useful formulation through which the success of financial deregulation policy can be gauged (Khan and Hasan, 1998).

The augmented investment model specified by Ogwumike and Ofoegbu (2012) for consolidation and deregulation effect:

\[ m/p = \psi(y, dc, d-\pi^e, \text{Bnkdrg}, \text{Consol}, \text{Nbank}) \]  

where v is \((\text{Bnkdrg}, \text{condum}, \text{nbank})\). Deregulating a system, induces competitive efficiency that causes \(m/p\) (savings) to increase; as real interest rate becomes positive. Thus, a positive compliment between the levels of competition and savings. Thus re-specifying equation seven;

\[ \text{Competition} = \psi(y, dc, d-\pi^e, \text{Bnkdrg}, \text{Consol}, \text{Nbank}) \quad (8) \]

\[ \text{Expectations: } \psi_y > 0, \psi_{dc} > 0, \psi_V > 0, \psi_{d-\pi^e} > 0, \psi_{\text{Findrg}} > 0, \psi_{\text{Condum}} < 0, \psi_{\text{Nbank}} < 0 \]

\[ \text{Competition: } \text{In a deregulated system, competition will be proxied by the interest rate spread, (as the wider the interest rate spread, the lower the competition, and narrow spread suggest higher competition)} \]

\[ Y : \text{Growth rate in Real GDP (captures the income and economic atmosphere; high income would suggest increase need for savings, banks would need to beat their competitor to absorb more savings and market share)} \]

\[ Dc : \text{Aggregate credit demand, proxied by the credit to the private sector (high credit demand, induces more competition, as the more demand, the more market to create more fund, given the interest rates)} \]

\[ d-\pi^e : \text{Real interest rate, in a deregulated financial system, should induce savings and competition level. Thus we expect a positive relationship between competition and real interest rate.} \]

\[ \text{Bnkdrg: Bank deregulation, encourages new players, allows market forces interplay in price determination, customer bargains, etc. thus its effect is expected to heighten competition (it will be proxied by financial deregulation index in appendix)} \]

\[ \text{Consol: Given the expectations from the Pro-deconcentrated theory (i.e. competition stability hypothesis) and the Pro-concentration theory (i.e. competition fragility hypothesis), the effect at this point can go both ways, thus left to the uncovering by the study. (Proxied by dummy 0-no consolidation, 1-consolidation era)} \]

\[ \text{Nbank: like the above variable, the sign and magnitude of this variable is ambiguous, and to be tested. Proxied by the total number of banks).} \]
7 Model Specification and Methodology

However the turn-out of the pre-test (ADF and Johenson Cointegration test), the Multiple Ordinary Least Square Regression technique will be the basic foundation; causing the functional model 7 to be stated mathematically as;

\[ \text{COMPETITION}_{\text{INSPDCOMP}} = \psi_0 + \psi_1 y + \psi_2 dc + \psi_3 d - \pi + \psi_4 \text{Bnkdrg} \pm \psi_5 \text{Consol} \pm \psi_6 \text{Nbank} + \mu (9) \]

Where: all the variables remain as specified in model 8, and the expectation of the parameter remaining as expected in the note of the functional form.

The data to be employed will be secondary time series data sourced from the Annual Statistical Bulletin of the Central Bank of Nigeria (CBN) covering the period 1986 to 2010. The choice of this period is based on the fact that deregulation in Nigeria took off with the introduction and commencement of the Structural Adjustment Program (SAP) in 1986. Consolidation will be captured with a traditional dummy variable (1 – consolidation period, 0 – pre consolidation era), the measurement of the bank financial deregulation will adopt the financial deregulation index as built by Fowowe (2008). The study will be carried out at macro level; it does not centre on firm specific factor or trend. Hence, it will be looking at the banking industry as a whole and not at individual bank basis or their market size. The study will employ inferential statistical technique of regression which will be dependent on the order of stationary of the variable which will be conducted using the Augmented Dickey fuller Test (ADF), and the Multiple Ordinary Least Square Regression.

8 Results

To avoid obtaining a spurious result by regressing non-stationary series, and also to scrutinize the integrating level of the variables which is to ensure that the variables are not of order I(2), the Augmented Dickey-Fuller (ADF) will be employed to test for Stationarity and the order of integration of variable. The results of the ADF unit Root test for checking for Stationarity of the data, and the determined order of integration is shown in the Table 1:

<table>
<thead>
<tr>
<th>Variables</th>
<th>Level {I(0)}</th>
<th>First Difference {I(1)}</th>
<th>Order of Integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONSOL</td>
<td>-0.5688</td>
<td>-4.7958***</td>
<td>I(1)</td>
</tr>
<tr>
<td>BNKDRG</td>
<td>-3.4201**</td>
<td>-5.2114***</td>
<td>I(0) AND I(1)</td>
</tr>
<tr>
<td>INSPDCOMP</td>
<td>-2.7651*</td>
<td>-8.4193***</td>
<td>I(0) AND I(1)</td>
</tr>
<tr>
<td>LOGDC</td>
<td>-1.9830</td>
<td>-3.9421***</td>
<td>I(1)</td>
</tr>
<tr>
<td>LOGBNK</td>
<td>-0.6475</td>
<td>-4.1863***</td>
<td>I(1)</td>
</tr>
<tr>
<td>LOGRGDP</td>
<td>-1.1237</td>
<td>-2.9722**</td>
<td>I(1)</td>
</tr>
<tr>
<td>RINTR</td>
<td>-4.0611***</td>
<td>-7.3941***</td>
<td>I(0) AND I(1)</td>
</tr>
</tbody>
</table>

**Critical levels:**

<table>
<thead>
<tr>
<th>1%</th>
<th>5%</th>
<th>10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3.7379</td>
<td>-2.9919</td>
<td>-2.6356</td>
</tr>
<tr>
<td>-3.7529</td>
<td>-2.9981</td>
<td>-2.9388</td>
</tr>
</tbody>
</table>

Where: ***, **, and *, signifies critical levels of significance at 1%, 5% and 10% respectively.

The table 1 above shows that all the variables are stationary at first difference. However, the bank deregulation variables (BNKDRG), the interest rate spread (INSPDCOMP) for competition, and the real interest rate, well found to be stationary at level. Hence, we conclude that the variables are stationary and should be regressed at first difference, to avoid spurious regression. However, following the rule of thumb as put by Gujarati (1999); that spuriousity in regressed result, is observed when the goodness of fit measure – “R-Square \((R^2)\)” is greater than the autocorrelation indicator - “Durbin-Watson (DW)”. That is, if \(R^2 > DW\), we have a spurious regression and the result is not reliable. But if the \(DW > R^2\), then we have a non-spurious regression whose report is reliable for forecasting and policy making.
Table 2. Johansen Cointegration Test (TRACE TEST)

<table>
<thead>
<tr>
<th>Sample (adjusted): 1988-2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Included observations: 23 after adjustments</td>
</tr>
<tr>
<td>Trend assumption: Linear deterministic trend</td>
</tr>
<tr>
<td>Series: INSPDCOMP LOGRGDP LOGDC RINTR BNKDRG CONSOL LOGNBANK</td>
</tr>
<tr>
<td>Lags interval (in first differences): 1 to 1</td>
</tr>
</tbody>
</table>

Unrestricted Cointegration Rank Test (Trace)

<table>
<thead>
<tr>
<th>Hypothesized</th>
<th>Trace</th>
<th>No. of CE(s)</th>
<th>Eigenvalue</th>
<th>Statistic</th>
<th>Critical Value</th>
<th>Prob.%**</th>
</tr>
</thead>
<tbody>
<tr>
<td>None *</td>
<td></td>
<td></td>
<td>0.983444</td>
<td>290.8386</td>
<td>125.6154</td>
<td>0.0000</td>
</tr>
<tr>
<td>At most 1 *</td>
<td></td>
<td></td>
<td>0.967919</td>
<td>196.5133</td>
<td>95.75366</td>
<td>0.0000</td>
</tr>
<tr>
<td>At most 2 *</td>
<td></td>
<td></td>
<td>0.877456</td>
<td>117.4072</td>
<td>69.81889</td>
<td>0.0000</td>
</tr>
<tr>
<td>At most 3 *</td>
<td></td>
<td></td>
<td>0.713081</td>
<td>69.12352</td>
<td>47.85613</td>
<td>0.0002</td>
</tr>
<tr>
<td>At most 4 *</td>
<td></td>
<td></td>
<td>0.660464</td>
<td>40.40677</td>
<td>29.79707</td>
<td>0.0021</td>
</tr>
<tr>
<td>At most 5 *</td>
<td></td>
<td></td>
<td>0.396821</td>
<td>15.56275</td>
<td>15.49471</td>
<td>0.0488</td>
</tr>
<tr>
<td>At most 6 *</td>
<td></td>
<td></td>
<td>0.157262</td>
<td>3.935293</td>
<td>3.841466</td>
<td>0.0473</td>
</tr>
</tbody>
</table>

Trace test indicates 7 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

<table>
<thead>
<tr>
<th>Hypothesized</th>
<th>Max-Eigen</th>
<th>No. of CE(s)</th>
<th>Eigenvalue</th>
<th>Statistic</th>
<th>Critical Value</th>
<th>Prob.%**</th>
</tr>
</thead>
<tbody>
<tr>
<td>None *</td>
<td></td>
<td></td>
<td>0.983444</td>
<td>94.32328</td>
<td>46.23142</td>
<td>0.0000</td>
</tr>
<tr>
<td>At most 1 *</td>
<td></td>
<td></td>
<td>0.967919</td>
<td>79.10812</td>
<td>40.07757</td>
<td>0.0000</td>
</tr>
<tr>
<td>At most 2 *</td>
<td></td>
<td></td>
<td>0.877456</td>
<td>48.28364</td>
<td>33.87687</td>
<td>0.0005</td>
</tr>
<tr>
<td>At most 3 *</td>
<td></td>
<td></td>
<td>0.713081</td>
<td>28.71675</td>
<td>27.58434</td>
<td>0.0357</td>
</tr>
<tr>
<td>At most 4 *</td>
<td></td>
<td></td>
<td>0.660464</td>
<td>24.84402</td>
<td>21.13162</td>
<td>0.0143</td>
</tr>
<tr>
<td>At most 5 *</td>
<td></td>
<td></td>
<td>0.396821</td>
<td>11.62746</td>
<td>14.26460</td>
<td>0.1254</td>
</tr>
<tr>
<td>At most 6 *</td>
<td></td>
<td></td>
<td>0.157262</td>
<td>3.935293</td>
<td>3.841466</td>
<td>0.0473</td>
</tr>
</tbody>
</table>

Max-eigenvalue test indicates 6 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level

The Johansen and Juselius (1990) method is adopted in testing for cointegration; that is a long run relationship among the variables. From Table 2 above, it is observed that the Trace test statistic indicates seven cointegrating equations at the 5% level of significance. While the Max-Eigenvalue test indicates six cointegrating equations at 5% level of significance. Suggesting we conclude we have a long run relationship among the variables.

The Regression.

OLS, using observations 1986-2010 (T = 25)
Dependent variable: INSPDCOMP

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Const</td>
<td>-262.201</td>
<td>58.296</td>
<td>-4.4977</td>
</tr>
<tr>
<td>Bnkdrg</td>
<td>-1.05929</td>
<td>1.07263</td>
<td>-0.9876</td>
</tr>
<tr>
<td>LogNbank</td>
<td>0.344862</td>
<td>2.39769</td>
<td>0.1438</td>
</tr>
<tr>
<td>Consol</td>
<td>-9.28599</td>
<td>3.98203</td>
<td>-2.3320</td>
</tr>
<tr>
<td>Logrgdp</td>
<td>22.1615</td>
<td>4.57301</td>
<td>4.8462</td>
</tr>
<tr>
<td>Logdc</td>
<td>-2.26123</td>
<td>2.80325</td>
<td>-0.8066</td>
</tr>
<tr>
<td>Rintr</td>
<td>-0.0534439</td>
<td>0.0531348</td>
<td>-1.0058</td>
</tr>
</tbody>
</table>

Mean dependent var: 10.65368
S.D. dependent var: 5.178703
Sum squared resid: 175.7054
S.E. of regression: 3.124326
R-squared: 0.636026
The result had shown in the regression table 5.4 above, that there is a joint significance in the independent variables (LOGRGDP, LOGDC, RINTR, BNKDRG, CONSOL, and LOGNBANK), as they affect the dependent variable (INSPDCOMP). This is indicated by the significant F-value \{(6, 18) = 7.989789\} and the 1% level of significant probability value \{P-value (F) = 0.00264\} which is less than the 0.05.

Investigating for individual effect, the result shows that bank consolidation (Consol) has a negative effect (≈-9.29) on the spread in interest rate. That is, the higher the efforts towards bank consolidation and a concentrated banking industry, the lower the interest rate spread, implying that bank recapitalization and other consolidating catalysis did improve efficiency and economics of scale in the industry. So in as much as consolidation, reduced the number of firms in the industry, it did bring about few mega banks with larger capital base, wider economics of scales and innovation, infusing competition in the industry; higher deposit rates to attract depositors and increase market share. On the other side, they also have lowered their lending rate to encourage investors; facilitating their ability to create money. Thus, we infer that bank consolidation does heighten competition in the Nigerian banking industry. This is significant at 5 percent level. The reliability of the result shows that the result is not spurious but reliable and viable as the Durbin-Watson value (2.4) is greater than the R-square (0.73). (Gujarati, 1999).

The Durbin-Watson statistic is a test for first-order serial correlation. If there is no serial correlation, the DW statistic will be around 2. The DW statistic will fall below 2 if there is positive serial correlation (in the worst case, it will be near zero). The result shows the absence of autocorrelation. It further suggest at 63.6% variation in the dependent variables is on account of the included independent variable. The remaining 36.4 percent are on account of the random variables.

Agreeing to the effect of deregulation and liberalization in increasing competition; their real interest rates and savings as put by Mckinnon and Shaw (1973), the result further stressed that bank deregulation (Bnkdrg) does have a negative effect (≈-1.06) on the interest rate spread; that is, as bank deregulation reforms frees the banking industry, competition in the industry improves. However, the magnitude of its effect on competition is yet to be substantial, as the poor probability value (which is less than 0.05) suggests that its effect is insignificant. The same can be said for the number of banks, as it is found to be an insignificant determinant to the width of interest rate spread therein competition.

The real gross domestic product (rgdp) used to proxy for the economic income and growth, seem to infuse pressure on the rates, as the growth in economic demand seem to pull up and widen the interest spread, causing a lessening in the level of competition. This suggests that the growing of the economy may lighten the need for fierce competition in the banking industry. This is significant at 1 percent. The reliability of the result shows that the result is not spurious but reliable and viable as the Durbin-Watson value (2.4) is greater than the R-square (0.73). (Gujarati, 1999).

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### Interpretation of result

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>P-value(F)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>F(6, 18)</td>
<td>7.989789</td>
<td>0.000264</td>
<td></td>
</tr>
<tr>
<td>Log-likelihood</td>
<td>-59.84762</td>
<td></td>
<td>133.6952</td>
</tr>
<tr>
<td>Schwarz criterion</td>
<td>142.2274</td>
<td></td>
<td>136.0617</td>
</tr>
<tr>
<td>Rho</td>
<td>-0.191882</td>
<td></td>
<td>2.375302</td>
</tr>
</tbody>
</table>

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9 Conclusion and policy recommendation

Having attained set objectives, and the deterministic ground on which our conclusion is based, we conclude that competition is of vital important and a necessary lubricant to ensuring efficiency in the development of the banking sector, as more competition will cause the deposit rate to increase to attract potential and existing customers into more savings and low lending or borrowing rate charges, to attract credible investor and credit seekers; therein a narrowing of the interest rate spread in aggregate. The study therefore infers that consolidation is an efficient tool to intensify competition; the same can also be said about deregulation. As both serve as good agents to reducing the interest rate spread and increasing efficiency in the Nigerian banking industry. The study recommends consistency in the implementation of reform and regulations in the industry especially as it relates to deregulation policies by the monetary and regulatory agencies in charge of money and banking in Nigeria. As the result has shown that deregulation indeed has the potency to bring about the needed competition in the industry, but its past efforts are yet to be significant which we ascribe to the inconsistency in the implementation of these policies. The high level of inconsistency reduces credibility and diminishes the confidence of the public not only to the banks but also the central bank as a whole. Also from the finding, it has been established that consolidation is also an effective tool to aggravating the level of competition in the industry. It is however note worthy so suggest that the Central Bank need to induce a more market based consolidation than a forced consolidation. As the latter are always resolves from urgency and necessity for survival; causing a spread of systematic risk; mismanagement, unnecessary diversification, poor corporate governance and market collusion.

References


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