“Post-recapitalization in Nigeria: how adequate is capital?”

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Amenawo I. Offiong, Hodo B. Riman, Godwin B. James, Emmanuel E. Okon and Anthony Ogar (2020). Post-recapitalization in Nigeria: how adequate is capital?. Banks and Bank Systems, 15(3), 207-217. doi:10.21511/bbs.15(3).2020.18

DOI

http://dx.doi.org/10.21511/bbs.15(3).2020.18

RELEASED ON

Thursday, 08 October 2020

RECEIVED ON

Tuesday, 31 March 2020

ACCEPTED ON

Thursday, 01 October 2020

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JOURNAL

"Banks and Bank Systems"

ISSN PRINT

1816-7403

ISSN ONLINE

1991-7074

PUBLISHER

LLC “Consulting Publishing Company “Business Perspectives”

FOUNDER

LLC “Consulting Publishing Company “Business Perspectives”

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Abstract

Bank capital is one of the protective and necessary parameters for better performance in any banking system. This may explain why the industry in Nigeria has been constantly recapitalized for sectorial enhancement. Given the various bank capital reforms the sectors have undergone and a number of interventions, the question arose: How adequate is capital? The study used descriptive statistics and Levene's test for equality of variance, as well as an independent sample t-test to look at the (10) ten various performance parameters for both pre- and post-recapitalization periods. From the results of the analysis, most of the performance parameters did not improve after post-recapitalization. This answers the question posed by the study that capital is not adequate in the Nigerian banking sector. Therefore, there is a need to inject more bank capital into the Nigerian banking sector if this sector must have a greater impact and respond to the challenges of the Nigerian economy for sustainable growth and development.

INTRODUCTION

Reforms in the Nigerian banking sector have always been aimed at repositioning and deepening the financial system in order to ensure the desired growth of the Nigerian economy and favorable competition at the global financial arena in accordance with established national, regional and international standards and best practices. According to Ajayi (2005) as cited in Adegbaju and Olokoyo (2008), the main thrust of reforming the banking sector is centered on addressing operational inefficiencies, poor governance and poor risk management that sought to hinder the health and soundness of the banking system at large. While the Nigerian banking industry has undergone a series of recapitalization policies aimed at strengthening the sector and ensuring better participation in the economy. This study desires to look at the post-recapitalization policy of 2004–2005, which is the last major recapitalization in the country.

This recapitalization policy in Nigeria was undertaken to sanitize the banking industry and make it a system that fits into the global financial dynamics, with that, the banking industry would become strong and reliable, especially with the prevailing global financial conditions. It was done primarily to position the banking system as one that must be efficient, in which depositors can trust and investors can rely upon. The main policy thrust of banking system recapitalization for that reform required banks to recapitalize from the prevailing NGN 2 billion to the new minimum capitalization of NGN 25 billion in full compliance by the end of December 2005. Banks that met the new minimum
capital requirement were given the operational approval to transact banking activities, while those that could not meet the requirements liquidated or merged up. This exercise caused the Nigerian banking industry to witness unprecedented mergers between the small and giant banks, which ultimately brought down the number of banks from 81 to 25. According to Sanusi (2010), “the surge from mergers and acquisitions of banks aimed at meeting the new minimum capitalization caused the capital market to witness a boost of NGN 406 billion in market capitalization, while NGN 360 billion was accepted by the Central Bank of Nigeria (CBN) in addition to foreign capital inflow of USD 654 million and GBP 161,993”. This improvement in the Nigerian financial system excited experts all over the world who expressed satisfaction with the success of the policy, which eliminated the old fashioned banking style for one that would move the economy forward.

Unfortunately, the hopes and prospects of the recapitalized banking system in Nigeria became short-lived as a result of these interdependent factors such as macroeconomic instability resulting from the sudden influx of huge inflow of capital funds, poor corporate governance stance in these banks, lack of transparency in the disclosure of the banks’ financial standings, the continuous wide gaps in financial regulations and laws, unstructured management processes and governance by the apex bank, and the weak operating environment for banks. In addition to this, the post-recapitalization experience in the Nigerian banking system included the injection of NGN 620 billion bailout funds to save most recapitalized banks, the sacking of indicted banks’ CEOs and appointment of advisers to these banks, restructuring of banks and huge impaired shareholders’ funds, huge exposure to non-performing loans and the establishment of the Asset Management Corporation of Nigeria (AMCON). Since the banking sector is the hub through which all other economic activities revolve, the soundness, prosperity and survival of the banking sector at any point in time are crucial to the overall performance of the Nigerian economy. Hence, given the prevailing situation in the Nigerian banking system after the 2004–2005 recapitalization exercise, the question that begs for answer is “How adequate is capital”?

1. LITERATURE REVIEW

Based on the capital cushion theory, a bank’s capital is expected to serve as a guard against operational losses in order to guard against uncertainties. According to Barrios and Blanco (2000), there are arguments from two schools of thought whether capital cushion should be determined by the regulatory model or the market model. Accordingly, at any point where the capital ratio of banks is not controlled totally, regulatory capital is set as a cushion to enforce sanction where established rule never existed. Capital base regulation by the apex bodies gives a close monitoring and controlling authority to the apex bodies. Banks are expected to meet the required minimum capital and maintain the same capital base throughout their corporate existence before they can be chartered. This minimum capital expectation was the necessity that brought about the adoption of the Basel Accord as a regulatory framework by ten industrial nations. Over the years, this Accord was further broken into the frameworks known as Basel I Accord, Basel II Accord, Basel III Accord and the Basel IV Accord. According to Koch and Macdonald (2010), the presumptions of the Basel Accords are on the basis of credit model where a bank’s required minimum capital base is determined by its asset composition, a situation where a higher credit risk would demand a higher required minimum capital base. The cardinal doctrine of the Basel I Accord sought to ensure a greater convergence on how the capital adequacy of banks would be measured and also to stop the erosion of capital standards as well in the system. Recognizing the weakness of the Basel I Accord on the basis of competitive inequalities in capital requirements in different nations, the Basel II Accord came into force to address this shortcoming. More specifically, the Basel II Accord was designed primarily to address financial innovation and the underlying risks associated with regulatory capital requirements in the banking system. However, the Basel III Accord came as result of the prevalent poor risk management and poor corporate governance in banks; and notably, the Basel III Accord was developed to harmonize trading book exposures, off-balance sheet vehicles and complex securitization issues mostly as a result of the 2007–2009 financial crises.
In the case of financial assets, given the role of bank capital, it is expected that when there is a high likelihood of generating losses, higher capital is only prudential. The level of perceived risk or uncertainty in an asset would be reflected in the assigned risk weight, but the parameter signs would be determined by the direction of change on the required capital cushion as the amount invested in any particular asset is altered. The direction of change complements the implied assets portfolio for mandatory capital adequacy requirements (Osota, 1994). The complements may be in the form of reducing uncertainty in certain other items. For example, an increase in the level of involvement in some low risk assets could reduce the funding risk of the portfolio, thus, reducing the portfolio capital requirement. In summary, if an increase in the level of involvement in a particular asset has the net effect of increasing a portfolio’s capital adequacy, then the accompanying sign should be positive. If it results in a net effect that decreases capital adequacy, then the accompanying sign should be negative (Osota, 1994).

The weakness of the link between bank capital and bank failures does not mean, however, that capital is irrelevant to bank solvency. Rather, it is evident that simple capital ratios are imperfect measures of capital adequacy in banks. As such, the important role of bank’s capital is revealing a bank’s rating externally and the credit worthiness of a bank to investors; hence, banks are subject to market discipline. Knowing the significant role of capital for banks, the need for adequate capital for insured banks is a pressing issue for most banks, especially in developing economies. Rose (1999) opined that a bank’s capital is a signal base showing the expansion and growth strength of the bank, building public confidence in the operational and risk management of the bank. In addition, Nzotta (2004) submitted that the core functions of a bank’s capital are protective, regulatory, and operational functions. Subject to certain economic expectations of a nation, the apex bank would often specify what minimum capital is required by licensed banks based on its guiding rules. Generally, the rules guiding the specified capital requirements should be reasonably sound in order for banks to maintain an operational margin that would protect bank creditors and depositors.

Many empirical works on the relationship between recapitalization and banks’ operations and performance have been put forward by many authors around the world (Buser, Chen, & Kane, 1981; Leightner & Lovell, 1998; Denizer, Dine, & Tarimcilar, 2007; Shanmugam & Das, 2004; Adetiloye, Taiwo, & Adegboye, 2018; Benjamin-Addy, 2013), and their findings have varied.

According to Obuobi, Nketiah, Awuah, and Amadi (2020a), recapitalization is a process seeking to boost, stabilize or overhaul the financial position or structure of a bank by swapping around various financing options. In their study of the Ghanaian banking sector, these authors concluded that recapitalization had the potential to improve banking system, especially in the long run. They placed emphasis on the cost to income ratio, profit after tax and net interest margin as possible post-recapitalization drivers of the banking sector in Ghana. This position was previously echoed by Boahene, Dasa, and Agyei (2012) as cited in Obuobi, Nketiah, Awuah, Agyeman, Ofosu, Adugyamf, Adjei, and Amadi (2020b) that the profitability of Ghanaian banks was significantly positive as a result of recapitalization (capital).

Relying on his arguments on the expected bankruptcy costs, Berger (1995) held that there existed a positive association between return on equity and capital ratio of banks in the USA. He concluded that as capital ratio is subsequently increased, return on equity will therefore increase as insurance expenses on debt uninsured are lowered. In agreement with Berger (1995), Kosmidou, Tanna, and Pasiouras (2008) concluded that recapitalization greatly influenced the profitability of banks owned solely by UK during the period of 1995–2002. In Nigeria, Adegbaju and Olokoyo (2008) revealed that proxies such as YEA, ROA and ROE varied significantly between the pre- and post-recapitalization periods.

In a related study on the impact of bank consolidation on selected banks’ performance in Nigeria, Owolabi and Ogunlalu (2013) as cited in Ali, Ekpe, and Aigba (2016) concluded that the return on capital employed by these banks was significantly different, while the return on assets and net profit margin were not in the pre and post recapitalization periods. Likewise, Sufian and Chong (2008) had earlier held that in Philippines, during the period from 1990 to 2005, the profitability of banks was positively influenced by capitalization. In support of Sufian and Chong (2008), Naceur and Omran (2011) examined some
Middle East and North African (MENA) nations from 1988 to 2005 and revealed that the profitability, cost efficiency and net interest margin of banks in MENA improved significantly as a result of bank capitalization.

In Spain, Trujillo-Ponce (2013) found that, though the short-run liquidity of banks may rise as a result of recapitalization, however, to guarantee a good profitable base and high asset quality, the operating macroeconomic environment for banks must be very conducive. A similar study in Spain by Martins, Serra and Stevenson (2019) concluded that the return on average assets was positively impacted by a higher level of capitalization while impacted negatively by the return on average equity. Lastly, studies by most authors (Athanasoglou, Brissimis, & Delis, 2005; Straub, 2007; Bedreldin & Kalhoefer, 2009; and Sadiq, Fatima, Bukonla, & Mobolaji, 2018) agreed with the conclusion that, recapitalization of banks could not enhance banks improvement. Using various bank performance indicators, these authors arrived at similar conclusion that the relationship that existed between bank recapitalization and performance was insignificant and negative as the case may be. In summary, the literature and the empirical review made above could not establish firmly whether capital, as often as its being raised (recapitalization) as regulatory requirements, actually determines bank’s performance or not. In different countries, periods, capital adequacy is still a subject of controversy among many authors. In Nigeria, having gone through various stages of recapitalizing the banking system and still proposing recapitalization, this study looks at how adequate capital is in seeking to position the Nigerian banking sector.

2. METHODOLOGY

Over the period, banking regulations and research have adopted effective measures to evaluate the performance of banks using the Capital Assets Management Earnings and Liquidities (CAMELS) approach as an evaluation tool. The CAMELS approach is a system developed in the United States to ascertain the overall position of banks per time. According to Obuobi et al. (2020b), the CAMELS measures of rating are assigned on a ratio-based analysis of various financial statement proxies. In addition to the proxies used by Obuobi et al. (2020b), this study advanced in its proxies by examining capital adequacy, liquidity, competitiveness, deepening, profitability, concentration, corporate governance, asset quality, non-performing loans, etc. The quantitative research approach constructed on the ex-post facto design is used in this study to analyze data extracted from the Central Bank of Nigeria’s annual reports and accounts for banks and the World Bank data for Nigeria. The analysis techniques are the descriptive statistics, Levene’s test for equality of variance and the independent sample t-test. Specifically, this study anchors its examination on the 2004–2005 recapitalization exercise in Nigeria on a pre and post basis such as:

Pre-recapitalization (1993–2005) = 13 years;
Post-recapitalization (2006–2018) = 13 years.

The proxies captured in this study to ascertain the position of bank recapitalization on its performance are banking system z-scores (BNZ); banking system credit to deposits (BCD); banking system liquid assets to deposits (LAD); banking system capital to assets (BSC); banking system capital adequacy ratio (CAR); banking system non-interest income to total income (NIIC); banking system net interest margin (NIM); banking system cost to income ratio (BCI); banking system non-performing loans (NPL); and banking system concentration (BSCT).

Based on the analysis, the hypotheses that will guide the findings of this study are put forward.

Individual sample t-test of equality:

\[
H_0: \mu_1 = \mu_2 \quad ("The two-population means are equal").
\]

\[
H_1: \mu_1 \neq \mu_2 \quad ("The two-population means are not equal").
\]

Levene’s test for equality of variances:

\[
H_0: \sigma_1^2 = \sigma_2^2 \quad ("The population variances of groups 1 and 2 are equal").
\]

\[
H_1: \sigma_1^2 \neq \sigma_2^2 \quad ("The population variances of groups 1 and 2 are not equal").
\]
However, when equality is assumed \( \sigma_1 = \sigma_2 \), the test statistic \( t \) is calculated as:
\[
t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}.
\]
(1)

with
\[
sp = \sqrt{\frac{(n_1 + 1)S_1^2 + (n_2 + 1)S_2^2}{n_1 + n_2 - 2}}.
\]
(2)

Also, when equality is not assumed \( \sigma_1 \neq \sigma_2 \), the test statistic \( t \) is calculated as follows:
\[
t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}},
\]
(3)

where the degree of freedom is calculated as:
\[
df = \frac{\left( \frac{S_1^2}{n_1} + \frac{S_2^2}{n_2} \right)^2}{\frac{1}{n_1-1} \left( \frac{S_1^2}{n_1} \right)^2 + \frac{1}{n_2-1} \left( \frac{S_2^2}{n_2} \right)^2}.
\]
(4)

where \( \bar{x}_1 \) = mean of the first sample; \( \bar{x}_2 \) = mean of the second sample; \( n_1 \) = sample size (that is, the number of observations) of the first sample; \( n_2 \) = sample size (that is, the number of observations) of the second sample; \( s_1 \) = standard deviation of the first sample; \( s_2 \) = standard deviation of the second sample; \( s_p \) = pooled standard deviation.

3. RESULTS

Tables 1 and 2 show a decrease in the value of the banking system capital adequacy ratio from a

**Table 1. Descriptive statistics analysis (pre-recapitalization)**

| Variables | N  | Range     | Minimum | Maximum | Mean    | Std. deviation | Variance |
|-----------|----|-----------|---------|---------|---------|----------------|----------|
| CAR       | 13 | 12.1000   | 11.3000 | 23.4000 | 16.376923 | 8595209       | 3.0990466 | 9.604966 |
| BSC       | 13 | 8.7900    | 7.210   | 16.0000 | 9.782308  | 5984169       | 2.1576227 | 4.655277 |
| LAD       | 13 | 28.5600   | 45.4500 | 74.0100 | 66.108462 | 2.4652588     | 8.886171  | 79.0080  |
| BNZ       | 13 | 7.6900    | 10.8700 | 18.5600 | 13.415385 | 6488764       | 2.339570  | 5.474254 |
| BCD       | 13 | 24.7500   | 81.5800 | 106.3300| 91.025385 | 2.1374792     | 7.076791  | 59.3956  |
| BSCG      | 13 | 36.6800   | 22.2800 | 58.9600 | 42.470679 | 1.1487130     | 4.1417437 | 17.1542  |
| NIM       | 13 | 14.9500   | 55.5500 | 70.5000 | 61.091538 | 1.3569455     | 4.8925366 | 23.9371  |
| BCI       | 13 | 5.6300    | 6.4900  | 12.1200 | 9.269231  | .4979940      | 1.795543  | 3.2242   |
| BNPL      | 13 | 10.6500   | 8.7500  | 19.4000 | 16.467692 | .7947753      | 2.8638004 | 8.2019   |
| Valid N (listwise) | 13 |

**Table 2. Descriptive statistics analysis (post-recapitalization)**

| Variables | N  | Range     | Minimum | Maximum | Mean    | Std. deviation | Variance |
|-----------|----|-----------|---------|---------|---------|----------------|----------|
| CAR       | 13 | 20.1500   | 1.7500  | 21.9000 | 15.925385 | 1.6708008     | 6.0241578 | 36.2900  |
| BSC       | 13 | 15.5100   | 1.4900  | 17.0000 | 10.876923 | 1.1261908     | 4.0605385 | 16.4881  |
| LAD       | 13 | 51.3300   | 17.3200 | 68.6500 | 35.684615 | 5.2910546     | 19.0771686 | 363.9380 |
| BNZ       | 13 | 7.2900    | 12.7800 | 20.0700 | 16.480769 | .5897625      | 2.1264190 | 4.5223   |
| BCD       | 13 | 39.4400   | 64.4700 | 103.9100| 86.113077 | 3.6881909     | 13.2979612 | 176.8360 |
| BSCG      | 13 | 32.5100   | 38.5800 | 71.0900 | 48.848462 | 3.1356652     | 11.3058015 | 127.8211 |
| NIM       | 13 | 18.1500   | 49.1800 | 81.3700 | 62.325385 | 2.5084812     | 9.044574  | 81.8022  |
| BCI       | 13 | 3.3700    | 5.6000  | 8.9700  | 7.470692  | .771586       | .979397   | .9600    |
| BNPL      | 13 | 13.2400   | 6.1600  | 19.4000 | 12.345000 | .9304606      | 4.7423228 | 22.4900  |
| Valid N (listwise) | 13 |

http://dx.doi.org/10.21511/bbs.15(3).2020.18

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The decrease in the banking system capital adequacy ratio suggests that capitalization may not have been done properly during the recapitalization period. Table 3 revealed a value of 0.148 signaling the acceptance of Levene's alternative hypothesis, since the probability value is greater than 5 percent (P > 0.05), indicating that the variance of the two groups are not equal. On the other hand, the independent sample t-test of equality of mean(s) result revealed that at the 5 percent level of significance, there was an insignificant variation between pre- and post-capitalization mean(s) of the banking system capital adequacy ratio (p (0.812 and 0.813 > 0.05)), hence, the null hypothesis is accepted as being statistically significant.

For the value of the banking system capital to assets, Tables 1 and 2 show an increase in the value of banking system capital to assets from a mean of 9.78 percent to 10.87 percent, respectively, for the pre- and post-capitalization periods.

Table 3. Levene’s test for equality of variances and independent sample t-test for equality of means

| Variables/Tests | Levene’s test for equality of variances | t-test for equality of means |
|-----------------|----------------------------------------|-----------------------------|
|                 | F    | Sig. | t    | Df  | Sig. (2-tailed) | Mean difference | Std. error difference | 95% confidence interval of the difference |
|                 |      |      |      |     |               |                |                           | Lower | Upper  |
| CAR             |      |      |      |     |               |                |                           |       |        |
| Equal variances assumed | 2.236 | .148 | .240 | 24  | .812          | .4515385       | 1.8789229                  | –3.4263678 | 4.3294447 |
| Equal variances not assumed | –     | –     | .240 | 17.936 | .813 | .4515385 | 1.8789229 | –3.4969458 | 4.4000228 |
| BSC             |      |      |      |     |               |                |                           |       |        |
| Equal variances assumed | 2.189 | .152 | –.858 | 24  | .399          | –1.0946151     | 1.2753072                  | –3.7267200 | 1.5374893 |
| Equal variances not assumed | –     | –     | –.858 | 18.276 | .402 | –1.0946151 | 1.2753072 | –3.7710388 | 1.5818080 |
| LAD             |      |      |      |     |               |                |                           |       |        |
| Equal variances assumed | 5.857 | .023 | 5.212 | 24  | .000          | 30.42384       | 5.8371876                  | 18.3764830 | 42.4712093 |
| Equal variances not assumed | –     | –     | 5.212 | 16.976 | .000 | 30.42384 | 5.8371876 | 18.1071123 | 42.7405800 |
| BNZ             |      |      |      |     |               |                |                           |       |        |
| Equal variances assumed | .147  | .704 | –3.49 | 24  | .002          | –3.065384      | .8768468                  | –4.8751075 | –1.2556617 |
| Equal variances not assumed | –     | –     | –3.49 | 23.784 | .002 | –3.065384 | .8768468 | –4.8759765 | –1.2547928 |
| BCD             |      |      |      |     |               |                |                           |       |        |
| Equal variances assumed | 5.246 | .031 | 1.152 | 24  | .261          | 4.91231        | 4.26281                   | –3.88570 | 13.71032 |
| Equal variances not assumed | –     | –     | 1.152 | 19.244 | .263 | 4.91231 | 4.26281 | –4.00222 | 13.82683 |
| BSCT            |      |      |      |     |               |                |                           |       |        |
| Equal variances assumed | 1.287 | .268 | –4.97 | 24  | .000          | –20.77203      | 4.1730722                  | –29.385153 | –12.159510 |
| Equal variances not assumed | –     | –     | –4.97 | 23.606 | .000 | –20.77203 | 4.1730722 | –29.392179 | –12.151893 |
| NIIC            |      |      |      |     |               |                |                           |       |        |
| Equal variances assumed | .478  | .496 | 3.279 | 24  | .003          | 6.049230       | 1.8450871                  | 2.2411581 | 9.8573035 |
| Equal variances not assumed | –     | –     | 3.279 | 22.846 | .003 | 6.049230 | 1.8450871 | 2.2309493 | 9.8675122 |
| BCI             |      |      |      |     |               |                |                           |       |        |
| Equal variances assumed | 2.510 | .126 | –433  | 24  | .669          | –1.233846      | 2.8519780                  | –7.1200395 | 4.6523472 |
| Equal variances not assumed | –     | –     | –433  | 18.469 | .670 | –1.233846 | 2.8519780 | –7.2147429 | 4.7470506 |
| NIM             |      |      |      |     |               |                |                           |       |        |
| Equal variances assumed | 13.078 | .001 | 3.281 | 24  | .003          | 1.861538       | .5673189                   | .6906497 | 3.0324272 |
| Equal variances not assumed | –     | –     | 3.281 | 18.565 | .004 | 1.861538 | .5673189 | .6722399 | 3.0508370 |
| BNPL            |      |      |      |     |               |                |                           |       |        |
| Equal variances assumed | 1.721 | .202 | –9.38 | 24  | .000          | –8.245384      | .8782605                  | –10.058025 | –6.4327441 |
| Equal variances not assumed | –     | –     | –9.38 | 17.091 | .000 | –8.245384 | .8782605 | –10.097598 | –6.3931712 |

The mean of 16.37 percent to 15.15 percent, respectively, for the pre- and post-capitalization periods. The decrease in the banking system capital adequacy ratio suggests that capitalization may not have been done properly during the recapitalization period. Table 3 revealed a value of 0.148 signaling the acceptance of Levene's alternative hypothesis, since the probability value is greater than 5 percent (P > 0.05), indicating that the variance of the two groups are not equal. On the other hand, the independent sample t-test of equality of mean(s) result revealed that at the 5 percent level of significance, there was an insignificant variation between pre- and post-capitalization mean(s) of the banking system capital adequacy ratio (p (0.812 and 0.813 > 0.05)), hence, the null hypothesis is accepted as being statistically significant.
pre- and post-capitalization periods. The observed increase in the ratio of banking system capital to assets indicates the effectiveness of the recapitalization exercise. This implies that the banking system capital to assets ratio shows greater improvement in the operations of banks during the post-recapitalization exercise. Table 3 further revealed a value of 0.152, signaling the acceptance of Levene’s alternative hypothesis, since the probability value is greater than 5 percent (P > 0.05); this indicates that the variances of the two groups are not equal. On the other hand, the independent sample t-test of equality of mean(s) result revealed that at the 5 percent level of significance, there existed a significant variation between pre- and post-capitalization mean(s) of banking system capital to assets (p (0.399 and 0.402 > 0.05)), hence, the null hypothesis is accepted as being statistically significant.

Tables 1 and 2 show a decrease in the value of banking system liquid assets to deposits from a mean of 66.10 percent to 35.68 percent, respectively, for the pre- and post-capitalization periods. The observed decrease in banking system liquid assets to deposits suggests an evidence of ineffectiveness of the recapitalization exercise in this regard. This implies that the banking system liquid assets to deposits ratio shows no improvement in the operations of banks during post-recapitalization. Table 3 revealed a value of 0.023, signaling the acceptance of Levene’s null hypothesis, since the probability value is less than 5 percent (P < 0.05); this indicates that the variances of the two groups are equal. On the other hand, the independent sample t-test of equality of mean(s) result revealed that at the 5 percent level of significance, there existed a significant variation between pre- and post-capitalization mean(s) of banking system liquid assets to deposits (p (0.000 < 0.05)); hence, the null hypothesis is rejected and concluded as being statistically significant.

The result for the banking system credit to capital ratio in Tables 1 and 2 showed a decrease in the value of banking system credit to capital from a mean of 91.02 percent to 86.11 percent, respectively, for the pre- and post-capitalization periods. The observed decrease in banking system credit to capital indicates the ineffectiveness of the recapitalization exercise in this regard. This implies that the banking system credit to capital ratio shows no improvements in the operations of banks during the post-recapitalization exercise. Table 3 revealed a value of 0.031, signaling the acceptance of Levene’s null hypothesis, since the probability value is less than 5 percent (P < 0.05); this indicates that the variances of the two groups are equal. On the other hand, the independent sample t-test of equality of mean(s) result revealed that at the 5 percent level of significance, there existed an insignificant variation between pre- and post-capitalization mean(s) of the banking system credit to capital ratio (p (0.263 > 0.05)), hence, the null hypothesis is accepted as being statistically significant.

The result for the banking system concentration in Tables 1 and 2 revealed an increase in the value of banking system concentration from a mean of 13.41 percent to 16.48 percent, respectively, for the pre- and post-capitalization periods. The observed increase in banking system concentration suggests an evidence of the effectiveness of the recapitalization exercise in this regard. This implies that the banking system concentration shows an improvement in the operations of banks during the post-recapitalization exercise. Table 3 shows a value of 0.268, signaling the acceptance of Levene’s alternative hypothesis, since the probability value is greater than 5 percent (P > 0.05); this indicates
that the variances of the two groups are not equal. On the other hand, the independent sample t-test of equality of mean(s) result revealed that at the 5 percent level of significance, there existed a significant variation between pre- and post-capitalization mean(s) of banking system concentration (p (0.000 > 0.05)), hence, the null hypothesis is rejected as being statistically significant.

Tables 1 and 2 showed a decrease in the value of banking system non-interest income to total income ratio from a mean of 42.47 percent to 1.44 percent, respectively, for the pre- and post-capitalization periods. The observed decrease in banking system non-interest income to total income indicates the ineffectiveness of the recapitalization exercise in this regard. This implies that the banking system non-interest income to total income ratio shows no improvement in the operations of banks during the post-recapitalization exercise. Table 3 also revealed a value of 0.496 signaling the acceptance of Levene’s alternative hypothesis, since the probability value is greater than 5 percent (P > 0.05); this indicates that the variances of the two groups are not equal. On the other hand, the independent sample t-test of equality of mean(s) result revealed that at the 5 percent level of significance, there existed a significant variation between pre- and post-capitalization mean(s) of the banking system non-interest income to total income ratio (p (0.003 > 0.05)), hence, the null hypothesis is rejected as being statistically significant.

The result of the ratio of the banking system costs to income in Tables 1 and 2 showed an increase in the value of the banking system cost to income ratio from a mean of 61.09 percent to 62.32 percent, respectively, for the pre- and post-capitalization periods. The observed increase in the banking system cost to income ratio indicates the effectiveness of the recapitalization exercise in this regard. This implies an improvement in efficiency of the sector after the re-capitalization exercise. Table 3 also revealed a value of 0.001, signaling the acceptance of Levene’s null hypothesis, since the probability value is less than 5 percent (P < 0.05); this indicates that the variances of the two groups are equal. On the other hand, the result of the independent sample t-test of equality of mean(s) revealed that at the 5 percent level of significance, there existed a significant variation between pre- and post-capitalization mean(s) of the banking system net interest margin (p (0.003 and 0.004 < 0.05)), hence, the null hypothesis is rejected as being statistically significant.

Tables 1 and 2 showed a decrease in the value of the banking system net interest margin from a mean of 9.26 percent to 7.40 percent, respectively, for the pre- and post-capitalization periods. The observed decrease in the banking system net interest margin suggests an evidence of the ineffectiveness of the recapitalization exercise in this regard. This implies that the banking system net interest margin shows no improvement in the operations of banks during the post-recapitalization exercise. Table 3 further revealed a value of 0.669 and 0.670 > 0.05), hence, the null hypothesis is accepted as being statistically significant.

Tables 1 and 2 showed an increase in the value of the banking system non-performing loans from a mean of 16.46 percent to 17.34 percent, respectively, for the pre- and post-capitalization periods. The observed increase in banking system non-performing loans indicates the ineffectiveness of the post-recapitalization exercise in this regard. This implies that the banking system non-performing loans show no improvement in the operations of banks during the post-recapitalization exercise. Table 3 also showed that a value of 0.202 signals the acceptance of Levene’s alternative hypothesis, since the probability value is greater than 5 percent (P > 0.05); this indicates that the variances of the two groups are not equal. On the other hand, the result of the independent sample t-test of equality of mean(s) revealed that at the 5 percent level of significance, there existed a significant variation between pre- and post-capitalization mean(s) of the banking system non-performing loans (p (0.000 < 0.05)), hence, the null hypothesis is rejected as being statistically significant.
CONCLUSION

The mean descriptive statistics values for various indicators of the banking system performance in the post-capitalization periods revealed a mixed result. The study concluded that only very few variables, such as the ratio of banking system capital to assets, banking system z-scores and banking system concentration, revealed evidence of effectiveness and improvement in the banking system’s operations, health and survival after the post-recapitalization exercise. On the other hand, variables, such as capital adequacy ratio, liquid assets to deposits ratio, bank credit to deposits ratio, the ratio of the banking system non-interest income to total income, banking system cost to income ratio, banking system net interest margin and banking system non-performing loans, revealed no evidence of effectiveness and improvement in the operations, health and survival of the banking system after the post-recapitalization exercise.

Given Levene’s test, the banking system liquid assets to deposits ratio and the banking system net interest margin only were found to be equal as a result of their insignificant statistical values of less than 0.05 as the case may be; while the respective variances for the banking system capital adequacy, the banking system capital to assets ratio, banking system z-scores, bank credits to deposits ratio, banking system concentration, banking system non-interest income to total income ratio, banking system cost to income ratio and banking system non-performing loans were not equal.

In conclusion, given the vast number of performance parameters that showed no improvement, regardless of the policy thrust of the 2004–2005 recapitalization exercise, the health and soundness of the Nigerian banking sector remains very fragile and capital is not adequate. Most firmly, the capital inadequacy, as confirmed by the findings of this study, justifies various government bailouts to banks since 2004–2005, bank restructuring and the creation of a recovery agency to deal with excess non-performing loans in the system. While the capital base from this study does not have a significant impact on banking performance, it may be useful for further research beyond capital to see if human management of the capital base can contribute to poor recapitalization performance.

AUTHOR CONTRIBUTIONS

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REFERENCES

1. Adegbaju, A. A., & Olokoyo, F. O. (2008). Recapitalization and banks' performance: A case study of Nigerian banks. *African Economic and Business Review*, 6(1), 1-12. Retrieved from http://eprints.covenantuniversity.edu.ng/281/1/recapitalization_and_banks_performance.pdf

2. Adetiloye, K. A., Taiwo, J. N., & Adegboye, F. B. (2018). Regulations of other financial institutions in a banking system growth. *Journal of Economic and Management Perspectives*, 12(1), 71-81. Retrieved from http://eprints.covenantuniversity.edu.ng/12862/1/12345%20j.pdf

3. Ajayi, M. (2005). Banking sector reforms and bank consolidation: Conceptual framework. *Bullion*, 29(2), 2-10. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.135.2181&rep=r ep&type=pdf

4. Ali, J. I., Ekpe, M. J., & Aigba, M. O. (2016). Banking sector reforms and bank performance in Sub-Saharan Africa: Empirical evidence from Nigeria. *Journal of Business and Management*, 18(5), 36-47. Retrieved from http://www.iosrjournals.org/iosr-jbm/papers/Vol18-issue5/Version-2/E1805023647.pdf

5. Athanasoglou, P. P., Brissimis, S. N., & Delis, M. D. (2008). Bank-specific, industry-specific and macroeconomic determinants of bank profitability. *Journal of International Financial Markets, Institutions and Money*, 18(2), 121-136. Retrieved from https://ideas.repec.org/a/eee/infiin/v18y-2008i2p121-136.html

6. Badreldin, A., & Kalhoefer, C. (2009). The effect of mergers and acquisitions on bank performance in Egypt. *German University in Cairo, Faculty of Management Technology* (Working Paper Series No. 18), 1-15. Retrieved from https://mgt.guc.edu.eg/wpapers/018badreldinKalhoefer2009.pdf

7. Barrios, U. T., & Blanco, J. M. (2003). The effectiveness of bank capital adequacy. A theoretical and empirical approach. *Journal of Banking & Finance*, 27(10), 1935-1958. doi:10.1016/S0378-4266(02)00311-4

8. Benjamin-Addy, E. (2013). The Banking Sector in Ghana: Issues in Relation to Current Reforms. Hamburg: Anchor Academic Publishing. Retrieved from https://www.anchor-publishing.com/document/287393

9. Berger, A. N. (1995). The relationship between capital and earnings in banking. *Journal of Money Credit and Banking*, 27(2), 432-456. https://doi.org/10.2307/2077877

10. Boahene, S. H., Dasa, J., & Agyei, S. K. (2012). Credit risk and profitability of selected banks in Ghana. *Research Journal of Finance and Accounting*, 3(7), 6-14. Retrieved from https://www.iiste.org/Journals/index.php/RJFA/article/view/2628

11. Buser, S., Chen, A., & Kane, E. (1981). Federal deposit insurance, regulatory policy and optimal bank capital. *The Journal of Finance*, 36(1), 51-60. https://doi.org/10.2307/2327463

12. Denizer, C., Dinc, M., & Tarimcilar, M. (2007). Financial liberalization and banking efficiency: Evidence from Turkey. *Journal of Productivity Analysis*, 27, 177-195. https://doi.org/10.1007/s11123-007-0035-9

13. Koch, I. W., & Macdonald, S. S. (2010). *Bank management* (7th Ed.). Ohio: South Western Cengage Learning.

14. Kosmidou, K., Tanna, S., & Pasious, F. (2008). *Determinants of Profitability of Domestic UK Commercial Banks: Panel Evidence from the Period 1995–2002* (Economics, Finance and Accounting Applied Research Working Paper Series No. RP08-4). Coventry: Coventry University. Retrieved from https://pureportal.coventry.ac.uk/files/3993593/Determinants%20of%20profitability.pdf

15. Leightner, J. E., & Lovell, C. A. K. (1998). The impact of financial liberalization on the performance of Thai banks. *Journal of Economics and Business*, 50(2), 115-131. https://doi.org/10.1016/S0148-6195(97)00073-8

16. Martins, A. M., Serra, A. P., & Stevenson, S. (2019). Determinants of real estate bank profitability. *Research in International Business and Finance*, 49, 282-300. https://doi.org/10.1016/j.ribaf.2019.04.004

17. Naceur, S. B., & Omran, M. (2011). The effects of bank regulations, competition, and financial reforms on banks’ performance. *Emerging Markets Review*, 12(1), 1-20. https://doi.org/10.1016/j.ememar.2010.08.002

18. Nzotta, S. M. (2004). *Money, banking and finance theory and practice*. Owerri: Hudson Jude Nigerian Publishers.

19. Obuobi, B., Nketiah, E., Awuah, F., & Amadi, A. G. (2020a). Recapitalization of banks: Analysis of the Ghana banking industry. *Open Journal of Business and Management*, 8(1), 78-103. https://doi.org/10.4236/ojbm.2020.81006

20. Obuobi, B., Nketiah, E., Awuah, F., Agyeman, F. O., Ofosu, D., Adiu-Gyamfi, G., Adjei, M., & Amadi, A. G. (2020b). Impact of currency redenomination on an economy: An evidence of Ghana. *International Business Research*, 13(2), 62-73. https://doi.org/10.5539/ibr.v13n2p62

21. Oluwemii, S. A. (1996). The implication of bank’s profitability on implementing the risk based capital requirements. *Nigerian Deposit Insurance Corporation Quarterly*, 6(1-2), 53-69.

22. Osota, R. (1994). Current capital standards and banks asset structure. An empirical tests for existence of linear relationship. *Nigerian Deposit Insurance Corporation Quarterly*, 4(2), 45-49.

23. Owolabi, S. A., & Ogunlolu, A. E. (2013). Banking industry
consolidation and financial performance of selected quoted banks in Nigeria. *Journal of Applied Finance and Banking, 3*(3), 219-238. Retrieved from https://ideas.repec.org/a/spt/apfiba/v3y2013i3f3_3_16.html

24. Rose, P. S. (1999). *Commercial bank management*. New York: McGraw Hill Company.

25. Sadiq, R., Fatima, B., Bukonla, O., & Mobolaji, A. (2018). Effect of recapitalization on banks’ financial performance in Nigeria. *International Journal of Contemporary Research and Review, 9*(1), 20425-20435. Retrieved from http://ijcr.info/index.php/ijcrr/article/view/399

26. Shanmugam, K. R., & Das, A. (2004). Efficiency of Indian commercial banks in India during the reform period. *Applied Financial Economics, 14*(9), 681-686. https://doi.org/10.1080/0960310042000233458

27. Straub, T. (2007). *Reasons for frequent failure in mergers and acquisitions*. Berlin: Springer. https://doi.org/10.1007/978-3-8350-9637-0

28. Sufian, F., & Chong, R. R. (2008). Determinants of bank profitability in a developing economy: Empirical evidence from Philippines. *Asian Academy of Management Journal of Accounting and Finance, 4*(2), 91-112. Retrieved from https://www.researchgate.net/publication/228683432_Determinants_of_Bank_Profitability_in_a_Developing_Economy_Empirical_Evidence_from_the_Philippines

29. Trujillo-Ponce, A. (2012). What determines the profitability of banks? Evidence from Spain. *Accounting & Finance, 53*(2), 561-586. https://doi.org/10.1111/j.1467-629X.2011.00466.x