



Does Mergers and Acquisitions Impact Capital Structure and Performance of Nigerian Banks?

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ABSTRACT

The study examines the association between merger and acquisition on capital structure, and financial performances of banks in Nigeria. It employed secondary data collected from the sampled banks annual financial report and accounts statement. Relevant literatures were reviewed and panel data model regression was employed in the study's analysis. Specifically, feasible generalized least square model was used to analyse the study's hypotheses after the pre- and post-estimation diagnosis. The study reveals that merger and acquisition have a strong direct effect on capital structure and performances, but a weak direct impact on survival and growth of the examined banks in Nigeria. The study recommends that weak banks in Nigeria should employ merger and acquisition strategy for their survival and growth, for a viable capital structure and for banks whose performance are below expectations.

Key words : Mergers and Acquisition, capital structure, Commercial Banks, Performance

1. INTRODUCTION

In Nigeria, the confidence restored to bank customers via mergers and acquisitions (M&A) from 2006 to date has made it a formidable force to reckon with in the banking industry. It is also to note that in Nigeria, reforms in the banking industry preceded against the backdrop of the bank crisis which was connected with highly undercapitalization of deposit-taking banks, weakness in regulatory and supervisory frameworks, weak management practices and tolerance of deficiencies in corporate governance behaviour of banks (Ebiaghan, Ojugbeli & Okoye (2017), Tarila & Ogege, 2019). Though bank reforms (M&A) reduced the competitiveness in the banking industry; however, it further strengthened the industry by way of enhancing banks' capital structure.

The banking industry plays a very significant role in economic development via the channeling of scarce financial resources from surplus units to deficit units. Banks implement M&A to expand, diversify and reduce the number of competitors and to have a viable capital structure, such that they can partake in both local and global markets for high business growth (Alin, Sabina & Nicu, 2021; and Santulli, Gallucci, Torchia & Calabro, 2020). According to Hu, Lu, Hui and Xing (2020), M&A refers to two or more corporate entities coming together to constitute one entity in order to expand synergy. Khan, Soundararajan and Shoham (2020) opined that the prime aim of M&A is to build shareholders' wealth via expanded synergies and that the synergies translate into reduction in cost of production (operational synergy), costs of capital (financial synergy) and price (collusive synergy); this study is centered on the financial aspect of M&A.

Banks occupy central position in the country's financial system and are essential agents in the development process. By intermediating between the surplus and deficit units in an economy, banks mobilize and facilitate efficient location of savings, thereby increasing the quantum of investments and hence national output (Afolabi, 2016). Through financial intermediation, banks facilitate capital formation (investment) and promote economic growth. The decade 1995 and 2005 were particularly traumatic for the Nigeria banking industry, with the magnitude of distress reaching an unprecedented level, thereby making it an issue of concern not only to the regulatory institutions but also to policy analyst and the general public. Thus, the need for a drastic overhaul of the industry was quite apparent.

In furtherance of the general overhauling of the financial system, the Central Bank of Nigeria (CBN) introduced major reform programs that changed the banking landscape of in 2004. The main thrust of the 13-point reform agenda was the prescription of minimum shareholders fund of ₦25 billion for Nigeria deposit money banks not later than December 31, 2005. In view of the low financial base of these banks, they were encouraged to merge (Fabinu, Jonny & Agbatogun, 2018). Solodu (2014) opined that the CBN choose to begin the Nigeria banking sector reforms process with the consolidation and recapitalization policy through M&A. This is done in order to arrest system decay, restoration of public confidence, building of strong and competitive players in the global arena, ensuring longevity and higher return to investors.

1.1 Rationale for the Study

The proliferation of banks M&A in Nigeria is attracting much attention, partly because of heightened interest in what motivates firms to merge and how M&A affects performance or efficiency. However, the study investigates the M&A on the capital structure and performance of banks. It is motivated by the relative dearth of empirical evidence on the impact of M&A on capital structure and performance. Broadly, handful of studies on M&A activities in the Nigeria banking industry provide mixed results. For instance, Altunbas and Ibanez (2004) reported that bank mergers taking place in the banking industry do lead to improved profitability. On the other hand, Vander (2016) reported a limited improvement in profit efficiency but not with reference to cross-border deals.

According to Pilloff and Santomero (2017), there is little empirical evidence of merger achieving growth or other important performance gains. Evidence supporting M&A to costs saving and efficiency gain is sparse (Beitel, 2013; and Abdelrahman & Elgiziry, 2019). In general, these studies provide mixed evidence and inconclusive evidence which appears counter-initiative and many fail to show a clear relationship between M&A and capital structure and performance. This study intends to investigate empirically, the potency of M&A as a survival strategy of banks in enhancing capital structure and performance, arising from the aforementioned, the broad objective of this study is to investigate the effects of merger and acquisition on capital structure and performance of banks in Nigeria. Specifically the study intends :

- i. To assess the effects of mergers and acquisitions on the capital structure of Nigerian banks.
- ii. To determine the effects of mergers and acquisition on the performance of Nigerian banks.
- iii. To ascertain whether merger and acquisition guarantee the survival and growth rate of Nigeria banks in the long run.

2.LITERATURE REVIEW

2.0 Conceptual Framework

2.1 Mergers and Acquisition

In management literature, mergers and acquisition (M&A) occupy a central place in external expansion, acting as a strategy for restructuring and control of corporate firms. In the views of Afgan, Sumiati and Ainur (2021), M&A can be seen as a different activity from internal expansion decisions like those determined by investment appraisal methods. M&A facilitates speedy growth and sustainability, which enhances management efficiency and maximizes performance and capital structure of the firm (Muhammad, Waqas & Migliori, 2019; Giudici & Bonaventura, 2018).

Over the years, changes in the regulatory environment have impelled banks across the globe to expand through M&A, in the hope that M&A would result to reduction in costs of production, enhanced capital structure, performance work, economies of scale and market power (Arindam, 2021; Ahsan, Mohammad & Ashutosh, 2021). Mergers according to Reddy, Muhammad and Noel (2019); Renneboog and Vansteenkiste (2019) refer to the combination of two or more corporate organizations leading to a larger one with the sole aim of enhancing their strengths resulting from synergy. On the other hand, acquisition is the possession (purchase) of one corporate organization by another one either by hostile takeover or expression of interests leading to a change in the name of the business or retaining the former name (Aggarwal & Garg, 2019; and Ansari & Mustafa, 2018). Ebiaghan & Jeroh 2020, Nazim, Fauzias, Junaidah and Uddin (2018) contended that M & A is a strategic resolve taken by corporate entities in order to realize

enhanced operational, financial collusive synergies. Thus, M&A is a strategic resolve to grow and expand organizations. *Rafaqat et al (2021)*; *Hassan and Lukman (2020)*; *Abdelrahman and Elgiziry (2019)*; *Akpan et al, (2018)*; and *Daniya et al (2016)* found positive and significant change in capital structure and performance due to M&A. Thus, M&A should be given exact relevance and recognition accorded to legal, strategic, and financial matters (*Shrestha, Thapa & Phuyal, 2017*; *Pazarskis, Vogiatzoglou, Koutoupis & Drogalas, 2021*).

Similarly, *Hu, Li, Li and Wang (2020)*; *Liu, Li, Yang and Li (2021)* reasoned that M&A impact on productivity, performance, capital structure and viability of firms. Interestingly, *Jallow, Masazing and Basit (2017)*; *Mardianto, Christian and Edi(2018)* found that M&A positively affect productivity, and performance. Contrarily, *Meglio and Risberg (2010)*; *Banal-Estanol and Seldeslachts (2011)*; *Nguyen, Yung and Sun (2012)* reported negative effect of M&A on firms' performance. According to *Patel (2018)*; *Tarila and Ogege (2019)*, M&A is a panacea for increasing the wellbeing of the organizations.

2.2 Empirical Review

This section reviewed empirical studies on mergers and acquisition, firm performance, and capital structure. Noteworthy is the fact that, there is dearth of studies assessing the relationships between mergers and acquisition, firm performance and capital structure, particularly in Nigerian context. For instance, *Khan et al, (2022)* assessed the effects of M&A on banks' profitability in Pakistan using primary data. The paired t-test and Pearson correlation results revealed that M&A do not significantly affects banks' profitability. More so, it was revealed that the performance of banks was more insignificant for non-financial organizations in Pakistan.

Khan et al (2022) comparatively analyzed the pre- and post-mergers' profitability: differential realization of financial and non-financial institutions in Malaysia using secondary data. Findings of the regression result showed that while post-mergers' profitability increased for both financial and non-financial institutions significantly and positively, pre-mergers were found to negatively and insignificantly affect the profitability of companies in Malaysia. *Rafaqat et al (2021)* studied the effect of M&A on technology firms' profitability in the United States of America (USA) using profitability ratios of return on asset (ROA), return on equity (ROE) and earnings per share (EPS). Independent sample t-test result showed that EPS, increased while both ROE and ROA deteriorated due to M&A.

Arindam (2021) examined the connection between M&A and financial, market and innovation of DMBs in India using secondary data. The regression results showed that smaller acquirers with higher book value and leveraged DMBs demonstrated improved long-term performance, market returns and innovations. *Alinet al, (2021)* carried out a study on the determinants of DMBs M&A in Romania using primary data (questionnaire). The regression result revealed that the size, profitability, and lending activities of the banks are the determinants of M&A in Romania.

Afgan et al, (2021) evaluated whether there are significant differences in market reactions and financial performance before and after M&A in Indonesia using secondary data. The paired sample t-test and Wilcoxon signed ranks test result revealed that there is insignificant effect of market reaction and financial performance before and after M&A in Indonesia. *Ahsan et al, (2021)* assessed the relationship between M&A and strategic assets of companies in India using secondary data. The regression results suggested that M&A positively and significantly contributes to the strategic assets of quoted companies in India.

Liu et al, (2021) examined whether Chinese firms perform before and after cross-border mergers and acquisitions increased using secondary data. The panel data regression and t-test results revealed that Chinese firms' performance increased after cross-border mergers and acquisitions; however, it was found that Chinese firms' performance did not increase significantly before mergers. *Pazarskis et al (2021)* evaluated the relationship between corporate mergers and accounting performance during a period of economic crisis in Greece. Secondary data were employed, and the regression estimation technique was used. Findings of the study revealed that corporate mergers contribute positively and significantly to the performance of companies in periods of economic crisis in Greece.

Liu et al (2021) employed Feasible Generalized Least Square (FGLS) regression on 86 cross-border M&A and 81 domestic M&A firms in China and

concluded that financial performance overall did not increase due to M&A. Also, the financial performance of state-owned firms in cross-border mergers decreased whereas domestic M&A companies were found to have enhanced performance in aspects of their return on assets and return on equity after M&A. Hassan and Lukman (2020) investigated the comparative effects of M&A on employees' productivity in selected Nigerian banks using primary data. The Paired t-test results showed that M&A significantly and positively affected employees' productivity levels. More specifically, the findings revealed that M&A increased advances per employee and deposits per employee and was found to be positive and significant.

3.1 Research Design

The *ex-post facto* research design was adopted in this study. This research design demonstrates the relationship between the independent and dependent variables. It is a research tool for demonstrating cause and effect relationship by analyzing past occurrences or events and already existing data obtained from the annual reports of the banks.

a non-probabilistic sampling technique (purposive sampling) will be used in selecting the sample size. The target population of the study is all quoted banks in Nigeria. As of 31st December 2020, there were twenty-five (25) quoted banks with national and regional banking license and authorization by the Central Bank of Nigeria, The selection of the quoted banks will be based on the inclusive and exclusion criteria. Consequently, quoted banks with international and national coverage, together with those that have disclosed the required datasets for the study (2011-2020) will be included in the study sample while quoted banks with regional coverage will be excluded from the sample of study, resulting to a sample of twelve (12) banks

3.2 Method of Data Analysis and Model Specification

The data of the study was analyzed in phases and in order of precedence – summary of descriptive statistics (mean, median, minimum, and maximum values, and standard deviation), and correlation matrix. Pre-estimation test and post-estimation tests (normality test, multicollinearity test, test for omitted variables, Hausman's specification test, Breusch-Pagan LM test, heteroskedasticity test, serial (autocorrelation) test). The summary of descriptive statistics was used to depict the nature of the dataset that will be used for the study. In addition to the summary of descriptive results, pre-estimation test involving correlation coefficient will be employed to assess the relationship between the dependent variables of the study.

The correlation coefficient was used to assess the relationship between the variables of the study. Correlation co-efficient is a measure of the strength of linear association between two variables (Gujarati, 2003). Correlation ranges between -1.0 and +1.0. If the correlation is positive, a positive relationship is inferred. If it is negative, the relationship is negative. More so, the variance inflation factor will be used to establish the presence or absence of multicollinearity in the empirical models of the study.

The panel data regression [pooled ordinary least square, fixed effects (FE), and random effects (RE) regressions] was considered in validating the study's hypotheses. The Hausman specification test was used to determine whether fixed effect or random effect is more efficient, while the Breusch-Pagan LM test was used to determine whether Pooled PLS or random effects is more appropriate. The following regression models are formulated:

$$SG = F(MAQ, PERF, CAPS) \quad eq.3.1$$

$$PERF = F(MAQ, SG, CAPS) \quad eq.3.2$$

$$CAPS = F(MAQ, SG, PERF) \quad eq.3.3$$

Equations 3.1 to 3.3 captured the relationship between mergers and acquisition, capital structure and firm performance measures of the study. In view of equations 3.1 to 3.3, the following equations are re-estimated in their explicit forms as follows:

$$SG_{it} = \alpha_0 + \alpha_1 MAQ_{it} + \alpha_2 PERF_{it} + \alpha_3 CAPS_{it} + \varepsilon_{it} \quad eq. 3.4$$

$$PERF_{it} = \alpha_0 + \alpha_1 MAQ_{it} + \alpha_2 SG_{it} + \alpha_3 CAPS_{it} + \varepsilon_{it} \quad eq. 3.5$$

$$CAPS_{it} = \alpha_0 + \alpha_1 MAQ_{it} + \alpha_2 SG_{it} + \alpha_3 PERF_{it} + \varepsilon_{it} \quad eq. 3.6$$

Note that in eq.3.1 and eq.3.4, PERF and CAPS are control variables to MAQ

Note that in eq.3.2 and eq.3.5, SG and CAPS are control variables to MAQ

Note that in eq.3.3 and eq.3.6, SG and PERF are control variables to MAQ

Furthermore, only the relationship between merger and acquisition (MAQ) and the independent variables in each of the equations (eqs. 3.4 to 3.6) will be analysed given the study's hypotheses.

Where:

MAQ = merger and acquisition; SG = survival and growth rate; *PERF*= performance; and *CAPS*= capital structure. α_0 - α_3 =Coefficients of regression; e=Error term; *i* = bank, *t*=timeframe.

Table 3.1: Measurement of Variables

Variables	Proxy	Measurement
Merger & acquisition	Asset base (Total assets)	Natural logarithm of asset-base of banks
Performance	Net profit after tax	Net profits after tax scaled down by total assets of banks
Survival and growth rate	Revenue growth rate	$\frac{\text{Previous period revenue} - \text{Current period revenue}}{\text{Previous period revenue}}$
Capital structure	Leverage	Financial leverage (ratio of debts to equity)

Source: Compiled by the Researcher, 2022

4. DATA PRESENTATION, ANALYSES AND DISCUSSION OF RESULTS

4.1 Presentation of Data

This section presents the data obtained in this current study. For this purpose, company specific data were obtained from 12 banks for 10 years ranging from 2011–2020. The list of banks as of 31st December 2020, sampled banks as of 31st December 2020,

4.1.1 Descriptive statistics

The data descriptive statistics is presented in table 4.1¹. Merger and acquisition proxy with total assets,² showed maximum of 22.8843, minimum of 18.8686, mean value of 21.1379, and standard deviation of 0.9284, respectively. The statistics shows that the merged banks are relatively equal in size given that the maximum (22.8843) and minimum (18.8686) merged size is relatively in ratio 1:1. and the deviation from the mean is moderately small (0.9284). The maximum survival and growth rate is 65.94%, minimum survival and growth rate is negative (-67.18%), mean survival and growth rate is negative (-13.21%), while the survival and growth rate standard deviation are 20.03%. The statistics suggests that on the average, the sampled banks in terms of survival and growth rate are not performing well since their average survival and growth rate is negative (-0.1321).

The performance (proxy with profit after tax³) of the sampled banks, reveals maximum of 0.0562, minimum of -0.0953, mean of -0.015 and standard deviation of 0.0202. The table also shows that the capital structure has a maximum of 254.75, minimum of 76.25, mean of 91.2929, and standard deviation of 22.4097. The mean capital structure (91.2929) suggests the extent to which on the average, banks use outside funds to a unit of equity.

While the statistics shows that a bank out of the sampled representative is indebted to the sum of 254.75 (maximum value) to a unit of equity.

Table 4.1: Summary of descriptive statistics

Variable	Obs.	Men	Std. Dev.	Min	Max
Merger and acquisition	120	21.1379	0.9284	18.8686	22.8843
Survival and growth rate	108	-0.1321	0.2003	-0.6718	0.6594

¹ The researcher scaled performance proxy with profit after tax by total asset (value of total equity) since taken the logarithm of their negative values is not possible. Furthermore, estimation of survival and growth rate resulted in survival and growth rate of 12 years missing. Hence number of observations for survival and growth rate is 108.

² Natural logarithm of actual values.

³ Actual value is scaled down by total assets

Performance	120	0.0150	0.0202	-0.0953	0.0562
Capital structure	120	91.2929	22.4097	76.25	254.75

Source: Researcher's Computation, 2022.

4.1.2 Correlation analysis

The study's variables correlation matrix is presented in tables 4.2. It shows capital structure (-0.3819) is negatively correlated with merger and acquisition proxy with total assets. It probably suggests that a rise(fall) in capital structure may discourage (encourage) merger and acquisition. On the other hand, survival and growth rate, and performance displayed a positive correlation with merger and acquisition. It perhaps suggests that increase(decrease) in survival rate and performance is likely to attract (discourage) merger and acquisition in the banking sector. The correlation between performance and capital structure, and merger and acquisition are moderate while that between survival and growth rate and merger and acquisition is weak.

Table 4.2 Correlations Matrix

Variable	MAQ	SG	PERF	CAPS
Merger and acquisition: MAQ	1.0000			
Survival and growth rate: SG	0.1428	1.0000		
Performance: PERF	0.4702	0.0561	1.0000	
Capital structure: CAPS	-0.3819	0.1221	-0.5083	1.0000

Source: Researcher's Computation, 2022.

4.3 Diagnostic Tests

The diagnostic tests were performed to reflect the model equations 3.4 to 3.6, and the study's hypotheses 1 to 3.

4.3.1 Multicollinearity test

Tables 4.3 presents the multicollinearity test for the independent variables, which were conducted using the Variance Inflation Factor (VIF) test. It is observed from table 4.3 that the range of the VIF values are below the rule of thumb VIF level of 10. In *panel 1*, VIF ranges from lowest of 1.33 (merger and acquisition) to highest of 1.53 (performance), with a mean VIF of 1.42. In *panel 2*, VIF ranges from lowest of 1.06 (survival and growth rate) to highest of 1.22 (merger and acquisition), with a mean VIF of 1.77. In *panel 3*, VIF ranges from lowest of 1.02 (survival and growth rate) to highest of 1.31 (merger and acquisition), with a mean VIF of 1.20. The result suggests that the independent and control variables are void of the issues of multicollinearity in this study.

Table 4.3 Variance Inflation Factor (VIF) test result

Panel 1: Eq. 3.4: RG, MAQ, PERF, CAPS			Panel 2: Eq. 3.5: PERF, MAQ, SG, CAPS			Panel 3: Eq. 3.6: CAPS, MAQ, SG, PERF		
VARIABLE	VIF	1/VIF	VARIABLE	VIF	1/VIF	VARIABLE	VIF	1/VIF
Performance	1.53	0.652414	Merger & acquisition	1.22	0.817753	Merger & acquisition	1.31	0.765316
Capital structure	1.40	0.715464	Capital structure	1.22	0.822334	Performance	1.28	0.778790
Merger & acquisition	1.33	0.751393	Survival & growth rate	1.06	0.943071	Survival & growth	1.02	0.979446
Mean VIF	1.42		Mean VIF	1.77		Mean VIF	1.20	

Source: Researcher's Computation, 2022.

4.3.2 Omitted variable test

The Ramsey RESET test for omitted variables (table 4.4) reveal in *panel 4* that eq. 3.4 do not suffer from omitted variables given that $\text{prob} > F = 0.2287$ (which is greater than 0.05). In *panel 5 and panel 6*, their $\text{prob} > F = 0.0000$. It suggests that eq. 3.5 and eq. 3.6 suffers from omitted variable. This then will become one limitation to the study's objective.

Table 4.4: Ramsey RESET test for omitted variables

Panel 4: Eq. 3.4: RG, MAQ, PERF, CAPS	Panel 5: Eq. 3.5: PERF, MAQ, SG, CAPS	Panel 6: Eq. 3.6: CAPS, MAQ, SG, PERF
F (3, 101) = 1.46	F (3, 101) = 10.66	F (3, 101) = 20.19
Prob> F = 0.2287	Prob> F = 0.0000	Prob> F = 0.0000

Source: Researcher's Computation, 2022.

4.3.3. Normality plot

Histogram of residual and density was plotted to visualize normality (figures 4.1, 4.2, & 4.3). Visualizing the residual and fitted value plotted with Kernel's density have some element of normality. The study, hence, presume normality of data from the visualization of the histogram.

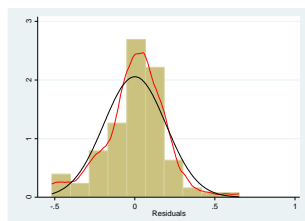


Figure 4.1

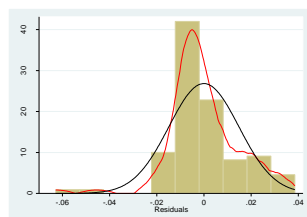


Figure 4.2

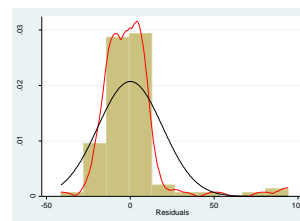


Figure 4.3

4.3.4. Hausman test

The Hausman test was used to choose between the fixed effects model and the random effect model for this study. The result of the Hausman test is shown in table 4.5. **Panel 7** (Eq. 3.4: RG, MAQ, PERF, CAPS) reveals that the prob.> $\chi^2 = 0.0002$ which is less than 0.05. The result suggests that the null hypothesis of difference in coefficients not systematic (accept random effects model) can be rejected. Rejecting the null hypothesis means that the researcher may adopt fixed effects model for eq. 4.

The prob. > χ^2 of **Panel 8**(Eq. 3.5: PERF, MAQ, SG, CAPS) and **Panel 9** (Eq. 3.6: CAPS, MAQ, SG, PERF) are 0.3000 and 0.3982, respectively and are greater than 0.05. They suggest that equations 3.5 and 3.6 may adopt random effects model since their null hypothesis which states that random effects are more appropriate cannot be rejected. While the acceptance of the fixed effects model in equation 3.4 may not necessitate performing the Breusch-Pagan LM test (Torres-Reyna, 2007), but it is necessary for equations 3.5 and 3.6. The Breusch-Pagan LM test is presented in section 4.3.5.

Table 4.5: Hausman Specification Test

Panel 7: Eq. 3.4: RG, MAQ, PERF, CAPS	Panel 8: Eq. 3.5: PERF, MAQ, SG, CAPS	Panel 9: Eq. 3.6: CAPS, MAQ, SG, PERF
$\chi^2(3) = 19.28$	$\chi^2(3) = 3.66$	$\chi^2(3) = 2.96$
Prob> $\chi^2 = 0.0002$	Prob> $\chi^2 = 0.3000$	Prob> $\chi^2 = 0.3982$
Suggested model = Fixed effects	Suggested model = random effects	Suggested model = random effects

Source: Researcher's Computation, 2022.

4.3.5 Breusch-Pagan LM test

The Breusch-Pagan LM test was conducted to choose the appropriate model for this study between the Pooled OLS model and the random effects model. The Breusch-Pagan LM test revealed a p-value = 0.0000 for equation 3.5 (**panel 11**) and 3.6 (**panel 12**) in table 4.5. The result suggests that the null hypothesis of Pooled OLS model is appropriate is rejected while the alternative hypothesis of random effects is appropriate is accepted. However, the Hausman's test has rejected the random effects model in **panel 7**. The Hausman's test result thus blur the Breusch-Pagan test result in **panel 10**. Thus, random effects model is elected for equation 3.4 and equation 3.5.

Three further tests however need to be performed before this study can finally accept the fixed effects model for equation 3.4, and random effects model for equations 3.5 and 3.6 as appropriate for study's objective. The tests are heteroskedasticity, autocorrelation (serial correlation), and cross-sectional independence tests.

Table 4.5 Breusch-Pagan LM Test

Panel 10: Eq. 3.4: RG, MAQ, PERF, CAPS	Panel 11: Eq. 3.5: PERF, MAQ, SG, CAPS	Panel 2: Eq. 3.6: CAPS, MAQ, SG, PERF
chibar ² (01) = 0.0000	chibar ² (01) = 58.00	chibar ² (01) = 23.47
Prob> chibar ² = 1.0000	Prob> chibar ² = 0.0000	Prob> chibar ² = 0.0000
Suggested model = Pooled OLS ⁴	Suggested model = random effects	Suggested model = random effects

Source: Researcher's Compilation, 2022

4.3.6: Heteroskedasticity, serial correlation (autocorrelation), and cross-sectional independence tests

Tables 4.6a, 4.6b. and 4.6c present the Modified Wald test for groupwise heteroskedasticity in fixed effect regression model.

Table 4.6a (Eq. 3.4: RG, MAQ, PERF, CAPS) shows that the data is not homoscedastic since the prob> chi2 is less than 0.05 (0.0000). However, the data has no serial correlation challenges since the p-value of the Wooldridge test for autocorrelation in panel data is greater than 0.05 (prob> F = 0.2135). Lastly, the Pesaran's test for cross-sectional independence tests p-values = 0.0000 (p-value < 0.05). However, its average absolute value of the off-diagonal elements of 0.464 is high enough to suggest that there is no cross-sectional independence challenge (De Hoyos & Sarafidis, 2006). Thus, Eq. 3.4 (RG, MAQ, PERF, CAPS) revealed that the data has only heteroskedasticity challenges.

Table 4.6a: Heteroskedasticity, Serial correlation, and cross-sectional independence tests (Eq. 3.4: RG, MAQ, PERF, CAPS)

Heteroskedasticity test	Serial correlation (autocorrelation) test	Cross-sectional independence test
Test: Modified Wald test for groupwise heteroskedasticity in fixed effect regression model	Test: Woodridge test for autocorrelation in panel data	Test: Pesaran's cross-sectional independence test:
Chi ² (12) = 177.88 Prob> chi ² = 0.0000	F (1, 11) = 1.744 Prob> F = 0.2135	Pesaran's test for cross-sectional independence = 10.811; Pr = 0.0000 Average absolute value of the off-diagonal elements = 0.464

Source: Compiled by researcher, 2022

Table 4.6b (Eq. 3.5: PERF, MAQ, SG, CAPS) shows that the data is not homoscedastic since the prob> chi2 is less than 0.05 (0.0000). It also has serial correlation challenges since the p-value of the Wooldridge test for autocorrelation in panel data is less than 0.05 (prob> F = 0.0019). The Pesaran's tests for cross-sectional independence tests reveals that a p-values of 0.0310 (p-value < 0.05). However, the average absolute value of the off-diagonal elements of 0.373 is relatively high and as such, the result can be interpreted to mean a cross-sectional independence (De Hoyos & Sarafidis, 2006). Thus, Eq. 3.5 (PERF, MAQ, SG, CAPS) revealed that the data has heteroskedasticity and serial correlation (autocorrelation) challenges, but it does not have cross-sectional dependence challenges.

Table 4.6b: Heteroskedasticity, Serial correlation, and cross-sectional independence tests (Eq. 3.5: PERF, MAQ, SG, CAPS)

Heteroskedasticity test	Serial correlation (autocorrelation) test	Cross-sectional independence test
Test: Modified Wald test for groupwise heteroskedasticity in fixed effect regression model	Test: Woodridge test for autocorrelation in panel data	Test: Pesaran's cross-sectional independence test ⁵ :
Chi ² (12) = 1228.40 Prob> chi ² = 0.0000	F (1, 11) = 16.323 Prob> F = 0.0019	Pesaran's test for cross-sectional independence = 2.157; Pr = 0.0310 Average absolute value of the off-diagonal elements = 0.373

Source: Compiled by researcher, 2022

Table 4.6c (Eq. 3.6: CAPS, MAQ, SG, PERF) shows that the data is not homoscedastic since the prob> chi2 is less than 0.05 (0.0000), it also has serial correlation (autocorrelation) challenges since the p-value of the Wooldridge test for autocorrelation in panel data is less than 0.05 (prob> F = 0.0000). The Pesaran's tests for cross-sectional independence tests revealed a p-values of 0.0000 (p-value < 0.05). However, the average absolute value of the

⁴ Pooled OLS cannot be employed since Hausman's test has rejected random effects (Torres-Reyna, 20076)

⁵ Pesaran, M. Hashem (2004) General Diagnostic Tests for Cross Section Dependence in Panels' IZA Discussion Paper No. 1240.

off-diagonal elements of 0.456 is relatively high and as such, the result can be interpreted to mean a cross-sectional independence (De Hoyos & Sarafidis, 2006). Thus, *Eq. 3.6(CAPS, MAQ, SG, PERF)* revealed that the data has heteroskedasticity and serial correlation (autocorrelation) challenges, but it does not have cross-sectional dependence challenges.

Table 4.6c: Heteroskedasticity, Serial correlation, and cross-sectional independence tests (Eq. 3.6: CAPS, MAQ, SG, PERF)

Heteroskedasticity test	Serial correlation (autocorrelation) test	Cross-sectional independence test
Test: Modified Wald test for groupwise heteroskedasticity in fixed effect regression model	Test: Woodridge test for autocorrelation in panel data	Test: Pesaran's cross-sectional independence test:
Chi ² (12) = 4500.29 Prob > chi ² = 0.0000	F(1, 11) = 42.443 Prob > F = 0.0000	Pesaran's test for cross-sectional independence = 9.027; Pr = 0.0000 Average absolute value of the off-diagonal elements = 0.456

Source: Compiled by researcher, 2022

4.4.1. Hypothesis 1: There is no significant relationship between merger and acquisition with capital structure of Nigerian banks.

The regression result in table 4.7a shows that the coefficient of merger and acquisition with survival and growth rate is positive (0.0511) and statistically significant at 1 per cent level (p-value = 0.006). The result did not support this study's hypothesis 1 which says that there is no significant relationship between merger and acquisition with survival and growth rate of Nigerian banks.

Table 4.7a: FGLS Regression (Cross-sectional time-series FGLS regression). (Eq. 3.4: RG, MAQ, PERF, CAPS)

Coefficients: generalized least squares		Number of obs. = 108		
Panels: heteroskedastic		Number of groups = 12		
Correlation: no autocorrelation		Time periods. = 9		
Estimated covariances = 12		Wald chi ² (3) = 8.77		
Estimated autocorrelations = 0		Prob > chi ² = 0.0325		
Estimated coefficients = 4				
Variables	Coeff.	Std. Er	t	p-value
Merger and acquisition	0.0511	0.0185	2.76	0.006
Performance	-0.1143	1.0740	-0.11	0.915
Capital structure	0.0015	0.0012	1.27	0.203
_cons	-1.3570	0.4193	-3.24	0.001

Source: Researcher's Computation, STATA 13.0, 2022.

4.4.2. Hypothesis 2: There is no significant relationship between merger and acquisition with performance of Nigerian banks.

Table 4.7b reveals that merger and acquisition coefficient (0.0055) have a positive bearing with performance at 1 per cent significance level (p-value = 0.000). The result failed to support the studies hypothesis 2 which states that there is no significant relationship between merger and acquisition with performance of Nigerian banks.

Table 4.7b: FGLS Regression (Cross-sectional time-series FGLS regression). (Eq. 3.5: PERF, MAQ, SG, CAPS)

Coefficients: generalized least squares		Number of obs. = 108		
Panels: heteroskedastic		Number of groups = 12		
Correlation: no autocorrelation		Time periods. = 9		
Estimated covariances = 12		Wald chi ² (3) = 36.48		
Estimated autocorrelations = 0		Prob > chi ² = 0.0000		
Estimated coefficients = 4				
Variables	Coeff.	Std. Er	t	p-value
Merger and acquisition	0.0055	0.0011	5.03	0.000
Survival and growth rate	-0.0047	0.0045	-1.05	0.292
Capital structure	-0.0003	0.0001	-2.72	0.007

Table 4.7b: FGLS Regression (Cross-sectional time-series FGLS regression). (Eq. 3.5: PERF, MAQ, SG, CAPS)				
_cons	-0.0766	0.0265	-2.89	0.004

Source: Researcher's Computation, STATA 13.0, 2022.

4.4.3. Hypothesis 3: There is no significant relationship between merger and acquisition with capital structure of Nigerian banks.

Table 4.7c showed that merger and acquisition have a positively insignificant influence on capital structure (coef. = 0.2249, p-value = 0.819). The result support the study's hypothesis 3 which states that there is no significant relationship between merger and acquisition with capital structure of Nigerian banks

Table 4.7c: FGLS Regression (Cross-sectional time-series FGLS regression). (Eq. 3.6: CAPS, MAQ, SG, PERF)					
Coefficients: generalized least squares			Number of obs. = 108		
Panels: heteroskedastic			Number of groups = 12		
Correlation: no autocorrelation			Time periods. = 9		
Estimated covariances = 12			Wald chi ² (3) = 4.12		
Estimated autocorrelations = 0			Prob> chi ² = 0.2492		
Estimated coefficients = 4					
Variables	Coeff.	Std. Er	t	p-value	
Merger and acquisition	0.2249	0.9823	0.23	0.819	
Survival and growth	-0.0047	4.1836	-0.07	0.945	
Performance	-125.1161	63.1662	-1.98	0.048	
_cons	85.2996	21.5844	3.95	0.000	

Source: Researcher's Computation, STATA 13.0, 2022.

4.5. Discussions

4.5.1. The statistically significant positive association between merger and acquisition and survival and growth rate suggests that merger and acquisition is a strong driver of bank survival and growth rate. The result suggests that a unit increase (decrease) in merger and acquisition will result in about 0.0511-points increase (decrease) in survival and growth rate where other determinants are held fixed. The result suggests that banks that consolidated through the merger and acquisition scheme have strong chance to survive and grow in Nigeria. It also suggests that merger and acquisition is a tool for survival strategy of banks to enhance capital structure and performance. Thus, to encourage bank survival and growth, banks are encouraged to merge or acquire the weaker ones. Furthermore, banks are encouraged to take advantage of merger and acquisition to expand, diversify and reduce the number of competitors and to have a viable capital structure, such that they can partake in both local and global markets for high business growth (Orits,Edirin & Ideh 2021,.Alin, Sabina & Nicu,2021; and Santulli, Gallucci, Torchia & Calabro, 2020).

4.5.2. The statistically significant positive bearing merger and acquisition have with performance suggests that it is a significant factor for explaining bank performance in Nigeria. The result suggests that a unit increase (decrease) in merger and acquisition may cause about 0.0055-points increase (decrease) in bank performances in Nigeria where other determinants are held fixed. The result corroborated some earlier studies that found positively significant influence of merger and acquisition on banks performance (Apazarskis et al., 2021; Liu et al., 2021; Al-Hroot et al., 2020; Edi et al., 2020; Ayoush et al., 2020; Hu et al., 2020; Kumar & Kaur, 2020; Muhammed et al., 2019; Aggarwal & Garg, 2019; Fabinu et al., 2018; Bedi, 2018; Giudici & Bonaventura, 2018; Jallow et al., 2017; Shrestha et al., 2017; Gupta & Banerjee, 2017; Daniya et al., 2016; Viverita, 2008; Mantravadi & Reddy, 2008).

The result, however, did not support the studies that showed insignificant influence of merger and acquisition on bank performance (Ebiaghan 2019a,2019b Khan et al., 2020; Afgan et al., 2021; Tarila & Ogege, 2020; Straub, 2007) nor the results that found inverse relationship between merger and acquisition and bank performance (Liu et al., 2021; Abdelralman &Elgiziry, 2019). The result also contradicted Okafor (2016) who remarked that the profit efficiency and asset utilization efficiencies of banks have deteriorated since the conclusion of the consolidated programme in Nigeria. This

study's result probably suggests that non-performing banks should merge to probably enhance their performance. Enhancing performance could facilitate speedy growth and sustainability (Seiyabo and Ebiaghan 2022, Mohammad et al., 2019; Giudici & Bonaventura, 2018).

The weak direct relationship between merger and acquisition and capital structure suggests that merger and acquisition is not strong to explain banks capital structure. However, the result suggests that a unit increase (decrease) in merger and acquisition will result in about 0.2249-points increase (decrease) in capital structure where other determinants are held constant. The result corroborated Afam-mebei & Ebiaghan (2022), Tarila and Ogege (2019) that found insignificant association between merger and acquisition and capital structure. It seems to support Modigliani and Miller (1958) postulation that capital structure of entities is irrelevant. However, the result did not support Lukman (2020), Abanum & Ebiaghan (2022), Abdelrahman and Elgiziry (2019), Akpan et al., (2018), and Daniya et al., (2016) that found positive and significant change in capital structure due to merger and acquisition. The result probably suggests that the consolidation has pulled funds from merged banks, and less reliability on debt (Tarila & Ogege, 2019; Taiwo & Musa, 2014).

Considering the findings of this study and the conclusion drawn, the following recommendations were suggested:

- i. Merger and acquisition are recommended for weaker banks as a strategy for survival and growth.
- ii. For banks that want to diversify and reduce their number of competitors, merger and acquisition is recommended for them to have a viable capital structure that will enable them to partake in local and global banking.
- iii. For banks whose performance are below expectation, it is recommended they merge

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