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Article

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Ownership concentration and bank profitability

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Abstract

We investigate whether ownership concentration influences bank profitability in a developing country context. We focus on bank ownership concentration measured as the amount of direct equity held by a majority shareholder categorised into: high ownership concentration, moderate ownership concentration and disperse ownership. We find that banks with high ownership concentration have higher return on assets, higher net interest margin and higher recurring earning power while banks with dispersed ownership have lower return on assets but have higher return on equity. Also, higher cost efficiency improves the return on assets of widely-held banks and the return on equity of banks with moderate ownership. The findings have implications.

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1. Introduction

We investigate whether ownership structure, a corporate governance determinant, play an important role for bank profitability. More specifically, we examine whether different levels of ownership concentration can explain differences in bank profitability. The question whether ownership structure influences the profitability of firms is examined by a fairly large literature with rather mixed results depending on the context examined (Arun & Turner, 2004; Choi & Hasan, 2005; Chen, Harford & Li, 2007), and such studies focus largely on foreign ownership (Greenaway, Guariglia & Yu, 2014), family ownership (De Massis, Kotlar, Campopiano & Cassia, 2013), state ownership (Cornett, Guo, Khaksari & Tehranian, 2010) and institutional ownership (Elyasiani & Jia, 2010), with little focus on direct equity holding of majority shareholders. In this study, we focus on a different ownership structure categorisation involving direct equity ownership concentration.

Bank ownership concentration is important because it can influence (or limit) bank managers' ability to divert bank profits as pecuniary benefits to themselves or as private control benefits to controlling shareholders which can lead to a reduction in firm value and could potentially hurt non-controlling shareholders that do not have control stake in banks. For instance, the 2004 to 2006 banking boom caused by excessive securitisation gains just before the 2008

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global financial crisis proved that bank insiders (mainly managers and controlling shareholders) exploited banks for their own purposes, thereby increasing the risk of bank failure, and gave rise to the need to identify an optimal bank ownership structure that improves bank performance while discouraging excessive risk-taking and misappropriation of profits among banks.

In Nigeria, the 2000–2010 banking reform led to bank mergers, acquisition and consolidation activities intended to strengthen the banking sector, and the merger, acquisition and consolidation process led to significant changes in bank ownership to permit ownership by various wealthy families and rich individuals including few institutional ownership in an attempt to reduce government's control of banks, which consequently led to greater number of individual shareholders with large direct equity holding in Nigerian banks. Moreover, large direct equity ownership by controlling shareholders can have serious consequences for bank profitability depending on whether controlling shareholders have private control benefits or whether there are shared control benefits that accrue to both controlling and non-controlling owners, and this effect also depend on the levels of ownership concentration in Nigerian banks. Therefore, our curiosity leads us to investigate the case of Nigeria to examine the influence of differing levels of ownership concentration on bank profitability and we focus on banks because they play an important role in the financial intermediation process in Nigeria and because they have additional characteristics that make them distinct from non-financial firms.

Using a sample of Nigerian banks, we find that banks with high ownership concentration are more profitable: they have higher return on assets (ROA), net interest margin (NIM) and recurring earning power (REP) while banks with dispersed ownership have higher return on equity (ROE). Also, higher cost efficiency improves the return on assets of banks that are widely-held and the return on equity of banks with moderate ownership.

Our contribution to the literature is two-fold. First, we contribute to the literature that explores the relationship between ownership concentration and firm profitability. By focussing on banks, our analyses provide insights on how different levels of bank ownership concentration affect bank profitability, we show that high ownership concentration has positive effects for ROA while dispersed ownership has positive effects for ROE while we observe no significant effect for moderate ownership in a developing country context. This insight gained can improve our understanding of specific ownership structures that improve bank profitability in developing countries. Secondly, our analyses contribute to the rich literature that explores the impact of ownership structure on firm performance, we show that apart from institutional ownership, family ownership and foreign bank ownership, direct equity ownership concentration is also a determinant of bank profitability for developing countries like Nigeria although this depends on the profitability metric employed. Thirdly, we contribute to the literature that explores the relationship between firm profitability and corporate governance determinants. By investigating a developing country context, we show that ownership concentration, a corporate governance determinant, is a possible corporate governance factor affecting bank profitability for developing countries. Finally, in contrast to prior Nigerian studies (Tsegba & Herbert, 2013; Uwuigbe & Olusanmi, 2012; Gugong, Arugu & Dandago, 2014), we investigate Nigerian banks and divide banks into three ownership categories to detect how concentrated ownership, moderate ownership and dispersed ownership affects bank profitability, an approach that has not being adopted by prior studies. This is our main contribution to the literature on ownership concentration and bank profitability in developing countries.

The rest of the paper is organised as follows. [Section 2](#) discusses the theoretical and conceptual framework. [Section 3](#) presents the relevant literature. [Section 4](#) describes data, sample selection and ownership structure categorisation. [Section 5](#) describes the methodology. [Section 6](#) discusses the results regarding the impact of ownership concentration on bank profitability. [Section 7](#) concludes.

2. Theoretical and contextual framework

Agency theory shows that managers use their discretion to pursue strategies that enrich themselves at the expense of shareholders (Jensen & Meckling, 1976). Managers can appropriate profits for personal use or to enhance their non-salary income and this practice leads to the misallocation of profits (Gedajlovic & Shapiro, 1998). Jensen and Meckling (1976) demonstrate that when large shareholders are involved in firm decision making, as is the case in Nigeria, the conflict of interest shifts from managers versus shareholders to controlling shareholders versus non-controlling (or minority) shareholders. When the conflict of interest shifts to controlling shareholders versus non-controlling (or minority) shareholders, internal corporate governance mechanisms may become less effective to reduce the agency problems between controlling shareholders and non-controlling shareholders because controlling

shareholders wield significant power to influence the decisions and actions of top management compared to non-controlling shareholders.

Moreover, the propensity for managers to misappropriate profit in the short-term to benefit themselves at the expense of controlling and non-controlling shareholders tend to be greater if managers do not have substantial ownership stake in firms they manage particularly in widely-held firms (that is, firms with dispersed ownership). When this is the case, managers can misappropriate profit for self-interest and such misappropriation of profits would negatively affect the level of reported profit of the firm; therefore, a negative relationship between dispersed ownership and profitability can be expected. However, a positive relationship between dispersed ownership and profitability can be expected if widely-held firms are made up of dispersed shareholders that exert some monitoring to limit managers from pursuing their self-interests, thus discouraging misappropriation of profits for perks, and such shareholders in widely-held firms may consist of bondholders, creditors, consumer protection agencies, government agencies, etc.

On the other hand, controlling shareholders can elect their representative(s) to the board of directors who will appoint a manager that will act in their self-interest. [Jensen and Meckling \(1976\)](#) and [Shleifer and Vishny \(1986\)](#) demonstrate that controlling shareholders can impose greater monitoring on management, and use their influence to compel managers to make decisions that increase overall shareholder value for all, thereby benefiting all shareholders including minority shareholders, which improves firm performance and profitability. More so, the additional monitoring imposed on managers by controlling shareholders can compel managers to maximise profits for the firm; hence, managers of firms with large controlling shareholders are less likely to pursue their selfish interests because of the additional monitoring imposed on them by controlling shareholders ([Thomsen & Pedersen, 2000](#)). As a consequence, we expect a positive relationship between firm profitability and concentrated ownership.

However, when controlling shareholders have incentives to maximize their own benefits at the expense of non-controlling shareholders, controlling shareholders will seek private benefits of control such as the extraction of corporate resources through perks or transfer of assets/profits, which in turn would hurt non-controlling shareholders through the resulting reduction in firm profit and firm value ([Jensen & Meckling, 1976](#)). When controlling shareholders pursue such objectives that increase their personal utility rather than maximise profit for all, then having such controlling shareholders can lead to decreased profitability for the firm. When this is the case, we expect a negative relationship between firm profitability and concentrated ownership.

In Nigerian banking, controlling (or large) shareholders are often owners of banks. Compared to the 1980s where government-owned banks dominated the banking system in Nigeria, today banking in Nigeria has undergone dramatic changes. Nigeria in recent times has a deeper banking system and a relatively stable banking system although the challenges of high bank concentration, limited competition, rising non-performing loans, weak corporate governance, financial exclusion and sub-optimal ownership structure still persist. Controlling shareholders in Nigerian banks have the largest ownership stake and wield significant influence on the actions of top management in banks. Controlling shareholders in Nigerian banks also influence the production of bank's accounting information and influence bank managers to divert corporate profits to themselves as private control benefits while minority shareholders suffer from the resulting reduction in firm value.

3. Literature review

The influence of ownership structure on firm performance has been examined in the literature with mixed conclusions. [Leech and Leahy \(1991\)](#) find a negative relationship between ownership concentration and profitability for large British companies implying that high ownership concentration has negative effects for profitability. [Lehmann and Weigand \(2000\)](#) investigate the impact of corporate governance on the performance of 361 German firms during the 1991 to 1996 period and find that ownership concentration negatively affect firm profitability although they observe that high ownership concentration only improves the profitability of listed firms with large shareholders. [Demsetz and Villalonga \(2001\)](#) did not find a significant relationship between ownership structure and firm performance. [Welch \(2003\)](#), adopting the model of [Demsetz and Villalonga \(2001\)](#), examine the relationship between ownership structure and the performance of Australian listed companies and find that ownership by top management significantly influence firm performance measured as accounting rate of return, but did not find a significant result when firm performance is measured by Tobin's Q. [Kapopoulos and Lazaretou \(2007\)](#) investigate the impact of ownership structure on firm performance among 175 Greek listed firms for the year 2000. After taking into

account the likely endogeneity between ownership structure and firm performance, they find that a more concentrated ownership structure improves firm profitability, and that higher firm profitability require a less dispersed ownership. In contrast, [Pervan, Pervan, and Todoric \(2012\)](#) examine the relationship between ownership structure and ROA for listed firms in Croatia and find that firms with dispersed ownership have higher ROA than those with concentrated ownership. [Phung and Mishra \(2016\)](#) examine the effect of ownership structure on the performance of listed firms over the 2007 to 2012 period and find a non-linear relationship between ownership structure and firm performance. They observe that foreign ownership improves firm performance up to a certain point beyond which higher foreign ownership leads lowers firm performance. [Lepore, Paolone, Pisano, and Alvino \(2017\)](#) find that higher ownership concentration with an efficient judicial system improves firm performance particularly in countries with weak investor protection. [Abdallah and Ismail \(2017\)](#) find that the positive relationship between corporate governance and firm performance is an increasing function of dispersed ownership and that the value addition of good corporate governance is not necessarily maintained at high levels of ownership concentration.

Among banks, [Micco, Panizza, and Yanez \(2006\)](#) investigate whether the performance of public and private banks is driven by political considerations during the 1995 to 2002 period. They find that state-owned banks located in developing countries have lower profitability and higher costs than their private-owned banks. They did not find a strong correlation between bank ownership and performance for banks located in industrial countries. [Iannotta, Nocera, and Sironi \(2007\)](#) investigate the relationship between ownership structure, risk taking and bank performance for 181 European banks during the 1999–2004 period. They find that ownership concentration does not significantly affect bank profitability but rather high ownership concentration is associated with better loan quality, lower asset risk and lower insolvency risk, thereby improving bank performance. [Lin and Zhang \(2009\)](#) investigate the impact of bank ownership reform on the performance of Chinese banks. They examine 60 Chinese banks during the 1997 to 2004 period, and find that ‘Big Four’ commercial banks which have concentrated ownership are less profitable, less efficient and have worse asset quality than other types of banks. [Ben Slama and Boulila \(2014\)](#) investigate the relationship between ownership structure and bank performance with a focus on 53 Islamic banks over the 2005 to 2009 period. They did not find a correlation between ownership concentration and firm performance measured by return on assets (ROA) and return on equity (ROE), amongst others. [Bian and Deng \(2017\)](#) examine Chinese banks over the 2007–2014 period and find that higher ownership dispersion improves return on assets, return on equity and reduces the ratio of nonperforming loans. Overall, the literature on bank ownership structure and firm performance provides mixed evidence.

Prior Nigerian studies examine the relationship between corporate governance and firm performance among non-financial firms in Nigeria. [Tsegba and Herbert \(2013\)](#) investigate the relationship between foreign ownership structure and firm performance for non-financial firms during the 2003 to 2007 period, and find that foreign ownership concentration has a negative impact on firm performance. [Uwuigbe and Olusanmi \(2012\)](#) find that institutional ownership has positive effects for ROA while foreign ownership has positive effects for listed firms in the financial sector. [Gugong et al. \(2014\)](#) find a positive significant relationship between ownership structure and firm performance, measured by return on assets (ROA) and return on equity (ROE). In contrast to prior Nigerian studies, we investigate a different type of ownership concentration categorisation. More specifically, we focus on Nigerian banks with controlling shareholders versus Nigerian banks with non-controlling shareholders and divide banks into three ownership categories to detect how concentrated ownership, moderate ownership and dispersed ownership affects bank profitability in Nigeria. This is our main contribution to the scant literature on ownership concentration and bank profitability in developing countries.

4. Data

4.1. Sample selection

Our study focus on Nigerian banks for which we extract bank financial statement data from Bankscope database which provides detailed information for Nigerian banks from 2006; hence, our dataset covers the 2006 to 2015 period. Data for 43 banks were obtained which consists of only 33 active banks. We exclude banks with missing values for 4 consecutive periods, and the sample is reduced to a final sample of 27 banks. Of the 27 banks, 13 banks are listed while 14 banks are either non-listed or delisted. Bankscope provides information on whether a bank is listed, non-listed or delisted. Finally, we did not make a distinction between commercial and non-commercial banks in order to obtain a large bank sample. [Table 2](#) reports the descriptive statistics including the mean and median for our data set.

4.2. Measuring ownership concentration

To measure different levels of bank ownership concentration, we use a simple criterion reflecting whether or not a bank has a majority shareholder with at least 70% direct equity holding or less than 40% direct equity holdings. To capture high ownership concentration, we introduce a dummy variable ‘CN’ that take the value of one if a majority shareholder has at least 70% direct equity holding, representing banks with concentrated ownership. To capture dispersed ownership, we introduce a dummy variable ‘DISP’ that take the value of one if a majority shareholder has less than 40% direct equity holding, representing banks with a dispersed ownership structure or banks that are widely held. To capture moderate ownership concentration, we introduce a dummy variable ‘MOD’ that take the value of one if a majority shareholder has between 50% and 69% direct equity holding, representing banks with moderate ownership concentration. Of the 27 banks in our sample, 7 banks have a majority shareholder with 70% direct equity holding (representing banks with high ownership concentration), 14 banks have a majority shareholder with less than 40% direct equity holding (representing banks with dispersed ownership) while 6 banks have a majority shareholder with 50–69% direct equity holding (representing banks with a moderate ownership).

5. Methodology

First, we follow prior literature to estimate bank profitability determinants using a static and dynamic panel model (Demirgüç-Kunt and Huizinga, 1999; Pasiouras & Kosmidou, 2007; Ozili, 2015; Ozili, 2017). We employ four measures of bank profitability (Π) as a function of capital adequacy (EQTA), cost efficiency (CI), regulatory capital ratio (TRC), asset quality (AQ) and macroeconomic growth rate (ΔGDP).

The model is given as:

$$\Pi_i, t = c + CI_i, t + AQ_i, t + EQTA_i, t + TRC_i, t + \Delta GDP_t + \varepsilon(OLS) \quad (1)$$

$$\Pi_i, t = c + \Pi_i, t-1 + CI_i, t + AQ_i, t + EQTA_i, t + TRC_i, t + \Delta GDP_t + \varepsilon(GMM) \quad (2)$$

Where Π is the dependent variable representing four measures of profitability: return on assets (ROA), return on equity (ROE), net interest margin (NIM) and recurring earnings power (REP). ROA is a measure of firm's operational performance (Ozili, 2017), measured as the ratio of profit after tax to average asset for bank ‘i’ at year ‘t’. Return on equity (ROE) measures the return to equity shareholders measured as the ratio of profit after tax to average equity for bank ‘i’ at year ‘t’ (Ozili, 2015). Net interest margin (NIM) measures the return to banks from interest-generating activities while recurring earnings power (REP) measures the ability of a firm/bank to generate income or profits over time assuming all current operational conditions remain constant; and is measured as pre-provision profit excluding net income from financial instruments and sale of securities and tax to average asset ratio. Cost efficiency (CI) is measured as cost to income ratio for bank i at year t, reflecting banks’ efficiency. Asset quality (AQ)¹ is measured as loan loss reserves to gross loans for bank i in year t (Ozili, 2017). Capital adequacy (EQTA) is measured as total equity to average assets for bank i in year t while regulatory capital ratio (TRC) is measured as tier 1+2 capital divided by total risk weighted assets (Ozili, 2015). Gross domestic product growth rate (ΔGDP) is measured as the change in gross domestic product at year t. Next, we interact each profitability determinants on the ownership variables to detect the impact, if any, of different levels of ownership concentration on bank profitability; thus, we estimate the model:

$$\Pi_i, t = c + DISP * CI_i, t + DISP * AQ_i, t + DISP * EQTA_i, t + DISP * TRC_i, t + \Delta GDP_t + \varepsilon \quad (3)$$

$$\Pi_i, t = c + \Pi_i, t-1 + DISP * CI_i, t + DISP * AQ_i, t + DISP * EQTA_i, t + DISP * TRC_i, t + \Delta GDP_t + \varepsilon \quad (4)$$

$$\Pi_i, t = c + MOD * CI_i, t + MOD * AQ_i, t + MOD * EQTA_i, t + MOD * TRC_i, t + \Delta GDP_t + \varepsilon \quad (5)$$

$$\Pi_i, t = c + \Pi_i, t-1 + MOD * CI_i, t + MOD * AQ_i, t + MOD * EQTA_i, t + MOD * TRC_i, t + \Delta GDP_t + \varepsilon \quad (6)$$

$$\Pi_i, t = c + CN * CI_i, t + CN * AQ_i, t + CN * EQTA_i, t + CN * TRC_i, t + \Delta GDP_t + \varepsilon \quad (7)$$

$$\Pi_i, t = c + \Pi_i, t-1 + CN * CI_i, t + CN * AQ_i, t + CN * EQTA_i, t + CN * TRC_i, t + \Delta GDP_t + \varepsilon \quad (8)$$

To estimate the model, we use static and dynamic estimation techniques. The static estimation is the fixed effect OLS estimator to capture bank-specific differences while the dynamic estimation is the GMM estimator to capture dynamic adjustments to bank profitability. We consider dynamic adjustments to bank profitability by taking the lag

¹Other studies use loan loss provisions to gross loan to measure asset quality (Ozili & Outa, 2017, etc.)

Table 1A
:Summary of descriptive statistics.

| | ROA | ROE | NIM | REP | CI | AQ | EQTA | TRC | ΔGDP |
|--------------|--------|---------|--------|--------|---------|--------|---------|---------|--------|
| Mean | 1.909 | 7.024 | 9.352 | 3.267 | 70.498 | 4.641 | 17.979 | 23.392 | 5.9600 |
| Median | 1.800 | 12.75 | 7.470 | 3.090 | 64.460 | 3.590 | 13.750 | 19.800 | 6.300 |
| Maximum | 13.790 | 45.920 | 68.180 | 24.890 | 306.800 | 33.090 | 98.800 | 124.020 | 8.200 |
| Minimum | -8.050 | -209.03 | -1.120 | -3.720 | 23.260 | 0.000 | -12.080 | -13.810 | 2.700 |
| Std. Dev. | 2.698 | 31.716 | 10.424 | 3.418 | 30.695 | 4.263 | 15.883 | 18.031 | 1.585 |
| Observations | 137 | 137 | 135 | 137 | 135 | 134 | 141 | 112 | 270 |

Table 1B
Ownership concentration and profitability.

| Banks with high ownership concentration | | | | |
|---|--------|--------|--------|--------------|
| Profitability (II) | Mean | Median | S.D | Observations |
| ROA | 2.332 | 2.00 | 3.726 | 34 |
| ROE | 6.826 | 18.325 | 38.538 | 34 |
| NIM | 10.346 | 6.715 | 14.873 | 34 |
| REP | 4.073 | 3.150 | 5.755 | 34 |
| Banks with moderate ownership | | | | |
| ROA | 1.932 | 1.715 | 3.419 | 26 |
| ROE | 2.422 | 8.035 | 43.856 | 26 |
| NIM | 7.478 | 7.610 | 3.433 | 26 |
| REP | 2.944 | 3.095 | 2.960 | 26 |
| Banks with dispersed ownership | | | | |
| ROA | 1.714 | 1.770 | 1.741 | 77 |
| ROE | 8.665 | 12.710 | 22.639 | 77 |
| NIM | 9.524 | 7.700 | 9.561 | 77 |
| REP | 3.021 | 3.060 | 1.807 | 77 |

of the profitability variables to take into account any possible endogeneity regarding profitability because one could argue that a profitable bank in the current year is likely to remain profitability in the next year due to profit persistence, thereby requiring analyses using lagged profitability values because today's profitability can potentially explain tomorrow's profitability. For the dynamic model, we use the Arellano and Bond (1991) first-difference GMM estimator to estimate the dynamic model. The GMM instruments are only applied to the lagged dependent variable while the other variables are considered as strictly exogenous. We report the Hansen test (or the J-statistic). The Hansen test checks for the validity, i.e. the exogeneity of the entire set of instruments as a group. Bank fixed effect is included in the OLS and GMM estimations. We discuss the results in [section 5](#).

6. Discussion of results

6.1. Descriptive statistics and correlation

Table 1A reports the full sample descriptive statistics for the variables while Table 1B reports the descriptive statistics for the profitability variables for each level of ownership concentration. In Table 1B, banks with high ownership concentration experience relatively higher return on assets (ROA), net interest margin (NIM) and recurring earnings power (REP), implying that banks with high concentrated ownership have better operational performance while banks with dispersed ownership have the lowest return on assets (ROA) but have the highest return on equity (ROE) implying higher returns to shareholders in banks that are widely held (dispersed ownership).

Table 2 reports the correlation among the variables. Focussing on the correlation between the profitability measures (ROA, ROE, NIM and REP) and ownership concentration variables (DISP, MOD and CN), we observe that DISP is positively correlated with profitability: ROA, ROE, NIM and REP implying that dispersed bank

Table 2
Correlation matrix.

| Variables | ROA | ROE | NIM | REP | CI | AQ | EQTA | TRC | ΔGDP | DISP | CN | MOD | LISTED |
|-----------|-----------|-----------|--------|-----------|-----------|---------|----------|--------|---------|-----------|----------|-------|--------|
| ROA | 1.000 | | | | | | | | | | | | |
| ROE | 0.839*** | 1.000 | | | | | | | | | | | |
| | 0.000 | | | | | | | | | | | | |
| NIM | 0.007 | 0.027 | 1.000 | | | | | | | | | | |
| | 0.942 | 0.784 | | | | | | | | | | | |
| REP | 0.810*** | 0.686*** | -0.056 | 1.000 | | | | | | | | | |
| | 0.000 | 0.000 | 0.573 | | | | | | | | | | |
| CI | -0.839*** | -0.767*** | 0.143 | -0.925*** | 1.000 | | | | | | | | |
| | 0.000 | 0.000 | 0.149 | 0.000 | | | | | | | | | |
| AQ | -0.611*** | -0.583*** | 0.054 | -0.369*** | 0.482*** | 1.000 | | | | | | | |
| | 0.000 | 0.000 | 0.588 | 0.000 | 0.000 | | | | | | | | |
| EQTA | 0.260*** | 0.088 | 0.162 | 0.253*** | -0.285*** | -0.014 | 1.000 | | | | | | |
| | 0.008 | 0.378 | 0.102 | 0.009 | 0.004 | 0.885 | | | | | | | |
| TRC | 0.318*** | 0.191* | 0.069 | 0.268*** | -0.325*** | -0.171* | 0.924*** | 1.000 | | | | | |
| | 0.001 | 0.053 | 0.485 | 0.006 | 0.001 | 0.084 | 0.000 | | | | | | |
| ΔGDP | -0.177* | -0.128 | -0.080 | -0.151 | 0.116 | 0.114 | -0.052 | -0.053 | 1.000 | | | | |
| | 0.075 | 0.196 | 0.421 | 0.129 | 0.242 | 0.252 | 0.604 | 0.591 | | | | | |
| DISP | 0.135 | 0.094 | 0.154 | 0.133 | -0.142 | -0.094 | 0.163* | 0.140 | 0.207** | 1.000 | | | |
| | 0.173 | 0.347 | 0.120 | 0.182 | 0.152 | 0.347 | 0.100 | 0.158 | 0.035 | | | | |
| CN | -0.089 | -0.045 | -0.102 | -0.123 | 0.126 | -0.007 | -0.173* | -0.148 | 0.127 | -0.635*** | 1.000 | | |
| | 0.367 | 0.653 | 0.300 | 0.217 | 0.203 | 0.945 | 0.081 | 0.133 | 0.201 | 0.000 | | | |
| MOD | -0.079 | -0.072 | -0.089 | -0.042 | 0.0502 | 0.125 | -0.029 | -0.024 | 0.132 | -0.614*** | -0.219** | 1.000 | |
| | 0.426 | 0.467 | 0.362 | 0.672 | 0.614 | 0.207 | 0.770 | 0.803 | 0.183 | 0.000 | 0.026 | | |
| LISTED | 0.100 | 0.004 | 0.172* | 0.0114 | 0.035 | 0.056 | 0.148 | 0.145 | 0.230** | 0.308*** | 0.414*** | 0.034 | 1.000 |
| | 0.314 | 0.967 | 0.082 | 0.909 | 0.721 | 0.571 | 0.135 | 0.145 | 0.019 | 0.002 | 0.000 | 0.734 | |

Table 3
Bank profitability determinants.

| | ROA | | ROE | | NIM | | REP | |
|-------------------------|-----------------------|----------------------|-----------------------|----------------------|---------------------|-------------------|-----------------------|----------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| | Coefficient | | Coefficient | | Coefficient | | Coefficient | |
| | (t-statistic) | | (t-statistic) | | (t-statistic) | | (t-statistic) | |
| | OLS | GMM | OLS | GMM | OLS | GMM | OLS | GMM |
| C | 10.088*** (8.75) | | 140.97*** (6.50) | | 9.359*** (2.89) | | 6.441*** (8.01) | |
| ROAt-1 | | 0.177 (0.98) | | | | | | |
| ROEt-1 | | | | 0.036 (0.24) | | | | |
| NIMt-1 | | | | | | -0.011 (-0.02) | | |
| REPt-1 | | | | | | | | 0.106 (1.49) |
| CI | -0.084*** (-12.63) | -0.128*** (-3.47) | -1.469*** (-11.69) | -1.541*** (-3.19) | -0.043** (-2.32) | -0.062 (-1.45) | -0.079*** (-17.05) | -0.081*** (-4.63) |
| AQ | -0.212*** (-4.81) | -0.028 (-0.09) | -3.457*** (-4.18) | -1.578 (-0.52) | 0.205* (1.66) | 0.343 (0.77) | 0.053* (1.72) | -0.062 (-0.55) |
| TRC | -0.004 (-0.19) | 0.141 (1.28) | 0.379 (0.96) | 0.659 (0.58) | -0.007 (-0.12) | -0.205 (-1.02) | -0.016 (-1.09) | 0.0007 (0.02) |
| EQTA | -0.083* (-1.85) | -0.032 (-0.38) | -0.874 (-1.03) | -1.627* (-1.88) | 0.124 (0.98) | 0.151 (1.42) | 0.094*** (2.98) | 0.113*** (3.25) |
| ΔGDP | -0.056 (-0.57) | -0.089 (-0.36) | -1.617 (-0.88) | -4.136* (-1.89) | -0.009 (-0.04) | -0.301 (-1.03) | 0.079 (1.16) | 0.229* (1.91) |
| Adjusted R ² | 82.88 | | 0.759 | | 91.53 | | 91.13 | |
| F-statistic | 19.28 | | 12.94 | | 41.82 | | 39.81 | |
| J-Statistic | | 3.28 | | 0.79 | | 6.962 | | 1.99 |
| P(J-Statistic) | | 0.35 | | 0.85 | | 0.07 | | 0.57 |
| Observation | 103 | 64 | 103 | 64 | 103 | 63 | 103 | 64 |

OLS and GMM regression includes bank fixed effect. Standard errors are not clustered. T-statistics are reported in parenthesis. *, **, *** denote statistical significance at 10%, 5% and 1% levels. CI = cost to income ratio, representing cost efficiency. AQ = loan loss reserves to gross loan ratio, representing asset quality. TRC = total regulatory capital ratio, representing bank regulatory capital. EQTA = equity to total asset ratio, representing capital adequacy ratio. ΔGDP = gross domestic product, growth rate, representing economic fluctuations. Πt-1 representing lagged profitability values in ROAt-1, ROEt-1, NIMt-1, REPt-1

ownership has positive effect for bank profitability. MOD is negatively correlated with profitability: ROA, ROE, NIM and REP implying that moderate bank ownership has a negative impact on bank profitability. Similarly, CN is also negatively correlated with profitability: ROA, ROE, NIM and REP, implying that concentrated ownership has negative effect for bank profitability. Overall, the correlation coefficients are not too high to be concerned with multicollinearity in the study.

6.2. Regression results

6.2.1. Profitability determinants

Table 3 reports the result for bank profitability determinants. As can be observed, CI coefficient is negative and significantly associated with profitability (measured as ROA, ROE and REP) in the static (OLS) and dynamic (GMM) estimations, implying that cost efficiency is a significant profitability determinant for Nigerian banks. EQTA coefficient is positive and significantly associated with profitability (measured as REP) in the static (OLS) and

Table 4
Bank profitability and dispersed ownership.

| | ROA | | ROE | | NIM | | REP | |
|-------------------------|----------------------|---------------------|---------------------|--------------------|-------------------|-------------------|----------------------|----------------------|
| | (1) | | (2) | | (3) | | (4) | |
| | Coefficient | | Coefficient | | Coefficient | | Coefficient | |
| | (t-statistic) | | (t-statistic) | | (t-statistic) | | (t-statistic) | |
| | OLS | GMM | OLS | GMM | OLS | GMM | OLS | GMM |
| c | 7.629*** (4.14) | | 49.326 (1.32) | | 7.089** (2.05) | | 5.586*** (3.87) | |
| ROAt-1 | | 0.279 (1.61) | | | | | | |
| ROEt-1 | | | | 0.168 (1.37) | | | | |
| NIMt-1 | | | | | | -0.055 (-0.14) | | |
| REPt-1 | | | | | | | | -0.020 (-0.17) |
| DISP*CI | -0.098*** (-5.43) | -0.163** (-2.15) | -0.821** (-2.25) | -1.417* (-1.81) | -0.018 (-0.55) | -0.133 (-1.51) | -0.097*** (-6.86) | -0.137*** (-4.37) |
| DISP*AQ | -0.169** (-2.12) | -0.070 (-0.21) | -3.102* (-1.92) | -1.092 (-0.38) | 0.172 (1.15) | -0.142 (-0.41) | 0.092 (1.46) | -0.045 (0.28) |
| DISP*TRC | 0.005 (0.13) | 0.109 (0.79) | 0.634 (0.88) | 0.007 (0.004) | -0.011 (-0.16) | -0.171 (-1.25) | -0.008 (-0.27) | -0.049 (0.72) |
| DISP*EQTA | -0.063 (-0.82) | -0.070 (-0.54) | 0.318 (0.21) | -1.517 (-1.19) | 0.171 (1.19) | 0.025 (0.22) | 0.073 (1.22) | 0.049 (0.72) |
| ΔGDP | -0.126 (-0.81) | -0.293 (-0.68) | -1.858 (-0.59) | -5.033 (-1.14) | 0.065 (0.22) | -0.495 (-1.19) | 0.064 (0.53) | -0.045 (-0.15) |
| Adjusted R ² | 58.32 | | 0.32 | | 90.79 | | 72.77 | |
| F-statistic | 6.29 | | 2.79 | | 38.27 | | 11.09 | |
| J-statistic | | 3.57 | | 1.59 | | 4.86 | | 1.29 |
| P(J-statistic) | | 0.31 | | 0.66 | | 0.18 | | 0.73 |
| Observation | 103 | 64 | 103 | 64 | 103 | 63 | 103 | 64 |

OLS and GMM regression includes bank fixed effect with no period fixed effect. Standard errors are not clustered. T-statistics are reported in parenthesis. *, **, *** denote statistical significance at 10%, 5% and 1% levels. CI = cost to income ratio, representing cost efficiency. AQ = loan loss reserves to gross loan ratio, representing asset quality. TRC = total regulatory capital ratio, representing bank regulatory capital. EQTA = equity to total asset ratio, representing capital adequacy ratio. ΔGDP = gross domestic product growth rate, representing economic fluctuations. DISP = dummy variable that equal one if the bank has a majority shareholder that holds less than 40% direct equity holding, representing banks with dispersed ownership structure. Πt-1 representing lagged profitability values in ROAt-1, ROEt-1, NIMt-1, REPt-1

dynamic (GMM) estimations, implying that capital adequacy has positive effects for bank profitability in Nigeria. AQ, TRC and ΔGDP coefficients report conflicting signs in the static (OLS) and dynamic (GMM) estimations.

6.2.2. Interaction regression: Ownership structure and bank profitability

Table 4 reports the result for banks with dispersed ownership. DISP*CI coefficient is negative and significantly associated with profitability (ROA, ROE and REP) in the static (OLS) and dynamic (GMM) estimations, implying that cost efficiency is a significant profitability determinant for banks with dispersed ownership. Also, DISP*AQ coefficient is negatively significant in the static estimation and insignificant in the dynamic estimation. DISP*TRC, DISP*EQTA and ΔGDP coefficients report insignificant signs. Overall, the result implies that cost efficiency is a significant determinant of the return on assets (ROA), return on equity (ROE) and recurring earnings power (REP) of banks with dispersed ownership and implies more efficient banks have better ROA, ROE and REP.

Table 5 reports the result for banks with moderate ownership concentration. MOD*CI coefficient is negative and significantly associated with profitability (ROE) both in the static (OLS) and dynamic (GMM) estimations implying that cost efficiency significantly influence the level of ROE for Nigerian banks with moderate ownership

Table 5
Bank profitability and moderate ownership concentration.

| | ROA | | ROE | | NIM | | REP | |
|-------------------------|---------------|---------|---------------|----------|---------------|---------|---------------|---------|
| | (1) | | (2) | | (3) | | (4) | |
| | Coefficient | | Coefficient | | Coefficient | | Coefficient | |
| | (t-statistic) | | (t-statistic) | | (t-statistic) | | (t-statistic) | |
| | OLS | GMM | OLS | GMM | OLS | GMM | OLS | GMM |
| c | 3.286** | | 49.942** | | 8.712*** | | 2.486** | |
| | (2.44) | | (2.23) | | (3.80) | | (2.06) | |
| ROAt-1 | | 0.507 | | | | | | |
| | | (1.09) | | | | | | |
| ROEt-1 | | | | 0.374 | | | | |
| | | | | (1.05) | | | | |
| NIMt-1 | | | | | | -0.156 | | |
| | | | | | | (-0.33) | | |
| REPt-1 | | | | | | | | 0.042 |
| | | | | | | | | (0.07) |
| MOD*CI | -0.081*** | -0.155 | -1.935*** | -2.535** | -0.073** | -0.093 | -0.065*** | -0.017 |
| | (-4.35) | (-1.60) | (-6.25) | (-1.99) | (-2.29) | (-0.78) | (-3.86) | (-0.09) |
| MOD*AQ | -0.198 | 1.879 | -2.619 | 31.956 | 0.203 | -3.554 | 0.007 | -0.350 |
| | (-0.96) | (0.74) | (-0.77) | (0.63) | (0.58) | (-0.95) | (0.04) | (-0.05) |
| MOD*TRC | 0.112 | 0.534 | 2.022 | 4.866 | -0.029 | 0.027 | 0.022 | 1.411 |
| | (0.43) | (0.47) | (0.47) | (0.39) | (-0.06) | (0.03) | (0.09) | (0.71) |
| MOD*EQTA | -0.585 | 3.785* | -10.636 | 13.77 | 0.387 | 4.164 | 0.064 | 2.228 |
| | (-1.35) | (1.68) | (-1.48) | (0.21) | (0.52) | (0.85) | (0.17) | (0.31) |
| ΔGDP | 0.067 | -0.126 | 0.429 | 0.015 | 0.005 | -0.009 | 0.118 | 0.199* |
| | (0.41) | (-0.42) | (0.16) | (0.01) | (0.02) | (-0.06) | (0.79) | (1.78) |
| Adjusted R ² | 51.26 | | 46.73 | | 91.11 | | 58.20 | |
| F-statistic | 4.97 | | 4.31 | | 39.69 | | 6.26 | |
| J-Statistic | | 1.10 | | 1.16 | | 2.41 | | 4.28 |
| P(J-Statistic) | | 0.78 | | 0.76 | | 0.49 | | 0.23 |
| Observation | 103 | 64 | 103 | 64 | 103 | 63 | 103 | 64 |

OLS and GMM regression includes bank fixed effect with no period fixed effect. Standard errors are not clustered. T-statistics are reported in parenthesis. *, **, *** denote statistical significance at 10%, 5% and 1% levels. CI = cost to income ratio, representing cost efficiency. AQ = loan loss reserves to gross loan ratio, representing asset quality. TRC = total regulatory capital ratio, representing bank regulatory capital. EQTA = equity to total asset ratio, representing capital adequacy ratio. ΔGDP = gross domestic product growth rate, representing economic fluctuations. MOD = dummy variable that equal one if the bank has a majority shareholder that holds between 50% to 69% direct equity holding, representing banks with a moderate ownership structure. It-1 representing lagged profitability values in ROAt-1, ROEt-1, NIMt-1, REPt-1

concentration; while MOD*TRC, MOD*EQTA and ΔGDP coefficients report insignificant signs or conflicting signs in the static and dynamic estimations.

Table 6 reports the result for banks with high ownership concentration. CN*CI coefficient is negative and significantly associated with profitability (ROA) in the static model and is insignificant in the dynamic model, providing conflicting results. Also, CN*AQ coefficient is negatively significant in the static model and insignificant in the dynamic model while CN*TRC, CN*EQTA and ΔGDP coefficients also report insignificant signs. Drawing inference from the two estimations, the results show that the profitability determinants report conflicting signs.

6.2.3. Sensitivity analysis: OLS vs GMM

To address some concern in favour of using one estimation technique i.e. OLS or GMM instead of both techniques, we use two estimation techniques to show that some of the main findings are not sensitive to alternative estimations particularly when profit persistence is taken into account. Assuming we use only OLS findings in Table 4, for instance, we observe that cost efficiency and asset quality are significant determinants of ROA and ROE for banks with dispersed ownership but these results do not hold true for asset quality when we adjust for profit

Table 6
Bank profitability and high ownership concentration.

| | ROA | | ROE | | NIM | | REP | |
|-------------------------|----------------------|-------------------|----------------------|-------------------|--------------------|-------------------|----------------------|--------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| | Coefficient | | Coefficient | | Coefficient | | Coefficient | |
| | (t-statistic) | | (t-statistic) | | (t-statistic) | | (t-statistic) | |
| | OLS | GMM | OLS | GMM | OLS | GMM | OLS | GMM |
| c | 3.661*** (2.81) | | 54.224** (2.28) | | 9.728*** (4.33) | | 3.695*** (3.25) | |
| ROAt-1 | | -0.509 (-0.91) | | | | | | |
| ROEt-1 | | | | -1.157 (-1.05) | | | | |
| NIMt-1 | | | | | | -0.606 (-0.53) | | |
| REPt-1 | | | | | | | | -0.725* (-1.73) |
| CN*CI | -0.077*** (-3.32) | 0.019 (0.07) | -1.767*** (-4.16) | -0.449 (-0.10) | -0.035 (-0.87) | 0.221 (0.71) | -0.076*** (-3.77) | 0.257 (0.91) |
| CN*AQ | -0.526** (-2.11) | -2.710 (-1.32) | -3.278 (-0.72) | -0.449 (-0.10) | 0.469 (1.09) | -0.885 (-0.68) | -0.166 (-0.76) | -3.074 (-1.29) |
| CN*TRC | 0.059 (0.34) | 3.723 (0.99) | -1.636 (-0.52) | 6.293 (0.77) | -0.027 (-0.09) | 1.252 (0.45) | -0.016 (-0.11) | 1.756 (1.19) |
| CN*EQTA | -0.429 (-1.24) | -6.958 (-1.31) | -0.513 (-0.08) | -1.267 (-1.06) | -0.027 (-0.09) | -2.095 (-0.65) | 0.009 (0.03) | -3.861 (-1.35) |
| ΔGDP | -0.002 (-0.01) | 0.364 (1.15) | -2.208 (-0.71) | 5.145 (1.31) | -0.095 (-0.32) | 0.141 (0.37) | 0.041 (0.28) | 0.309** (2.61) |
| Adjusted R ² | 48.65 | | 32.45 | | 90.41 | | 58.47 | |
| F-statistic | 4.58 | | 2.81 | | 36.63 | | 6.32 | |
| J-statistic | | 0.62 | | 0.32 | | 4.17 | | 2.95 |
| P(J-statistic) | | 0.90 | | 0.96 | | 0.24 | | 0.40 |
| Observation | 103 | 64 | 103 | 64 | 103 | 63 | 103 | 64 |

OLS and GMM regression includes bank fixed effect with no period fixed effect. Standard errors are not clustered. T-statistics are reported in parenthesis. *, **, *** denote statistical significance at 10%, 5% and 1% levels. CI = cost to income ratio, representing cost efficiency. AQ = loan loss reserves to gross loan ratio, representing asset quality. TRC = total regulatory capital ratio, representing bank regulatory capital. EQTA = equity to total asset ratio, representing capital adequacy ratio. ΔGDP = gross domestic product growth rate, representing economic fluctuations. CN = dummy variable that equal one if the bank has a majority shareholder that holds at least 70% direct equity holding, representing banks with concentrated ownership structure. It-1 representing lagged profitability values in ROAt-1, ROEt-1, NIMt-1, REPt-1

persistence in the dynamic model. Similarly, focusing on the OLS results in Table 5, we observe that cost efficiency is a significant determinant of ROA, ROE, NIM and REP for banks with moderate ownership but the result only holds true for ROE when we adjust for profit persistence using the dynamic model. Similarly, focusing on the OLS results in Table 6, we observe that cost efficiency and asset quality are significant determinants of ROA for banks with high ownership concentration but the results report conflicting evidence when we adjust for profit persistence using the dynamic model. Therefore, we base our final inference on the findings that do not change when both the static and dynamic estimations are used.

7. Conclusion

In this study, we examine the impact of different levels of ownership concentration on bank profitability in Nigeria. The findings indicate that banks with high concentrated ownership have higher return on assets, net interest margin and recurring earnings power, implying that banks with high ownership concentration have better operational performance while banks with dispersed ownership have the lowest return on assets and have the highest return on

equity, implying that banks with dispersed ownership provide better returns to shareholders. We also find that higher efficiency has positive effects for ROA among banks with dispersed ownership, and has positive effects for ROE for banks with moderate ownership concentration. The implication of the findings is that, although banks with concentrated ownership record higher profitability, their profitability do not appear to be significantly driven by economic drivers of bank profitability.

For policy purposes, if bank regulators/supervisors are concerned about improving bank profitability, we recommend that bank regulators should encourage concentrated bank ownership provided that control benefits are shared between controlling and non-controlling shareholders. Policy makers should encourage high concentrated ownership which can help improve firm performance. Moving forward, future research could investigate the impact of foreign ownership and institutional ownership on bank profitability in developing countries. Also, in other developing countries where the government has full or part ownership of banks, future research could examine whether full or part state ownership of banks improves banks' operational performance in developing countries.

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