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Managerial discretions and loan loss provisions in Nigerian banks: empirical IFRS and risk evidence

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Aim: The high level of non-performing exposures and the existing crisis in the Nigerian banking sector is a source of concern. To create a basis for solving the troubles caused by the loan loss crisis, this study investigated the managerial discretionary use of loan loss provisions (LLPs) by Nigerian deposit money banks (DMBs). This is considered in the context of solvency risk and reforms embedded in the adoption of International Financial Reporting Standards (IFRSs).

Design/research methods: Datasets related to the variables of the study were hand-collected from annual reports of a sample of 16 Nigerian deposit money banks over the period of 2007-2017. The analyses were performed using principal components analysis to derive the managerial discretions index (MDI), Prais-Winsten ordinary least square regression to segregate LLP into reported LLPs (TLLP) and discretionary LLPs (DLLP) and appropriate panel data regression models to test the study's hypotheses subsequent to series of diagnostic tests.

Conclusions/findings: The results revealed that managerial discretions negatively influence TLLP and DLLP represented by absolute value of DLLP (ADLLP). This represents an increase in profitability without manipulatingloan loss provisions. However, the reforms embedded in IFRSs revealed the use of LLPs for managerial discretions despite reduction in provisioning level noticeable during IFRS. The situation of Nigerian banks threatened by solvency risk use of LLPs for managerial discretions while attempting to increase profit was exemplified in the increase in ADLLP rather than TLLP. However, improvement was noticeable for risky Nigerian banks during IFRS. The managerial discretionary use of LLPs especially during IFRS was engendered by use of LLPs for capital management and earnings smoothing rather than earnings signalling as further revealed. This shows that adoption of International Financial Reporting Standards reduces reporting quality of Nigerian banks in their loan loss decisions.

Originality/value of the article: The derivation of MDI from measures of earnings smoothing, capital management and earnings signalling is the study's contribution to accounting for loan losses literature.

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The adjustments to LLPs to reduce variability of earnings, meet up with minimum regulatory bank capital adequacy ratio and signal strength to absorb future losses encapsulate earnings smoothing, capital management and earnings signalling respectively.

Implications of the research: The discretionary use of LLPs found in this study beckons an increased level of surveillance, oversights and reforms on the part of the regulators for compliance level devoid of managerial opportunistic behaviour to be identifiablewith Nigerian banks.

Keywords:Deposit money banks, IFRSs, loan loss provisions, managerial discretions, solvency risk.
JEL: D22, G21, G28, L20, M41.

1. Introduction

Managerial discretions can positively or negatively affect businesses depending on the extent and direction of its use. In the banking industry, the discretionary attributes of bank managers are embedded in the use of loan loss provisions (LLPs) for three basic decisions of earnings smoothing/management, capital management and earnings signalling (Salami 2021). While the use of LLPs for any of the three decisions is not illegal, extreme use of LLPs to manage capital and/or earnings may attract regulatory sanctions while non-use of LLPs to signal strength by a bank may lead to reduction of the investor' confidence in such a bank.

The continuous relevance of LLPs in the literature might be related to its proportion in banks' total accruals usually representing not less than 50% (Ryan 2011; Beatty, Liao 2014), traceability to quality of earnings of depository financial institutions (Leventis et al. 2011) and having its source from the largest component of banks' assets called "loans and advances" (Gebhardt, Novotny-Farkas 2011). The crisis that can emanate from non-performing exposures or an unholy build-up of non-performing loans provides rationale for centrality of LLPs to bank corporate reporting/soundness as LLPs to be charged in the income statement is linked to level of non-performing assets in the banks' asset structure.

Since 'retained earnings' which are subject to the adjustments to LLPs is one of major components of banks' core capital (Tier 1 capital), adjustments to banks' capital adequacy can be attributed to amount of LLPs charged in the statement of profit or loss and other comprehensive income of a bank. The probable imposition of sanctions on banks whose capital adequacy ratio falls below regulatory minimum can also prompt adjustments to the bank capital ratio. In Nigeria, a fall of the capital

adequacy ratio of deposit money banks (DMBs) below the acceptable ceilings of 10%, 15% and 16% for DMBs with national/regional operating licensing, international authorisation and domestic systemic importance status respectively (Central Bank of Nigeria [CBN] 2019) leads, following the requirements of CBN Supervisory Intervention Framework (CBN 2019), to being categorised as undercapitalized to various degrees, or even insolvent (CBN 2010). Thus, attempts to avoid being optimised as insolvent, regulator's take-over of management/control and/or revocation of operating licence may provide incentive for lopsided management of capital by banksmanagement of capital by banks.

The use of LLPs by banks is also associated with earnings manipulation aimed atoptimisation of earnings or reduction in earnings variability, also known as earnings/income smoothing. Since LLPs account for larger proportion of bank accruals, using LLPs to adjust earnings upward or downward and hide true financial condition of their entities become easily attainable for bank managers. In the relevant literature, positive relationship between LLPs whether reported or discretionary and pre-tax and pre-LLPs earnings symbolizes use of LLPs to manage or smooth earnings (Schechtman, Takeda 2018;Muriu, Josea 2020; Nikulin, Downing 2021). From another perspective, higher LLPs might represent a higher exposure to non-performing assets and a means of reduction in bank profitability, it indeed encapsulates the ability of banks to absorb future losses or a sign of financial strength (Dushku 2016; Ozili, Outa 2017), in particular in case of unidentified threats. However, the signals provided via LLPs might mislead the investors in their decisions if achievable via abnormal/discretionary LLPs (DLLP) rather than actual/reported LLPs (TLLP).

As argued in the literature, risk of insolvency which shares common boundary with probability of default of an entity is considered to be one of drivers of use of managerial discretions in loan loss decisions (Leventis et al. 2011). The cost of regulatory intervention when a bank in serious solvency crisis has its management taken over (Yasuda et al. 2004) may be so pervasive that recovery may take a long period of time. This is an explanationfor the positive relationship between excessive use of managerial discretions and poor financial condition of banks (Bhat 1996). However, some restrictions on level of opportunistic discretions when embedded in

accounting rule like principles-based globally-recognized International Financial Reporting Standards (IFRSs) have the capacity to reduce extensive use of discretionary attributes in corporate reporting (Ashbaugh, Pincus 2001; Abdallah et al. 2018; Mensah2020). This might be responsible for Nigerian DMBs reporting in IFRSs while still reporting in local accounting standards as directed by CBN (CBN 2010; Sanusi 2010a) before official date of 1 January 2012 approved by Financial Reporting Council of Nigeria (FRCN) for all public interest entities.

The outcome of the 2009 special audit of all Nigerian DMBs by CBN showed how use of managerial discretions in accounting for loan losses could result in serious banking crisis and lopsided corporate reporting (Otusanya, Lauwo 2010; Sanusi 2010a, 2010b;Otusanya, Uadiale 2014). Nevertheless, the events that followed subsequent reforms of provision of bail-outs, Prudential Guidelines revision, establishment of Asset Management Corporation of Nigeria and in particular adoption of IFRSs (CBN 2010; Sanusi 2010a, 2010b, 2011) with attendant confidence of the regulators in the stability of Nigerian banks (Sanusi 2012) require further investigation. The issues related to alleged material irregularities in the financial reports of Stanbic IBTC Holdings that led to sacking the board and directive for restatement of the bank's financial statements for 2013 and 2014 financial years (FRCN 2015) is a typical example. The scenario of the collapse of Skye Bank Plc who ceased to operate in its brand name after acquiring a bridge bank (Proshare 2017) is another typical example. The non-performing loans crisis bedeviling Diamond Bank Plc that led to its acquisition by Access Bank Plc in January 2019 and insider non-performing loans imbroglio that almost tore apart the board of First Bank Holdings Plc in the first quarter of 2021 are recent evidence of crisis in the Nigerian banking sector that followed IFRS adoption.

Although financial reporting issues related to the use of LLPs to manage capital, smooth earnings and signal financial strength fall within the scope of bank managerial discretions (Soedarmono et al. 2017; Pramono et al. 2019), the conceptualisation of bank managerial discretion and its derivation using appropriate statistical technique is unique to this study. The index of discretionary attributes of bank management in loan loss decisions facilitates the reference to bank managerial discretions as a single measure as against separate earnings management, capital

management and earnings signalling peculiar to previous studies including recent ones (Muriu, Josea 2020; Chen et al. 2021; Le et al. 2021; Nikulin, Downing 2021). Also, in the Nigerian context, the test of joint moderating influence of bank riskiness and adoption of IFRSs for the use of LLPs for various discretionary decisions is exclusive to this study compared to Ozili (2015), Eneje et al. (2016), Atoyebi and Simon (2018) and Ozili and Outa (2019).

The aim of this study is to create a basis for solving the troubles caused by the loan loss crisis by investigating the managerial discretionary use of loan loss provisions (LLPs) by Nigerian deposit money banks (DMBs). In order to achieve this aim, the remainder of this study is divided into four sections: "Literature review", "Materials and methods", "Results and discussion" as well as "Conclusions".

2. Literature review

2.1. Theoretical underpinning

This study is premised on "positive accounting theory" (PAT) since decisions being examined centre on use of managerial opportunistic discretions. Watts and Zimmerman (1986) arguethat the generation of accounting information by corporate entities depends on the choice of accounting principles as a result of explicit contract with the managers. The explicit contracts that prompt choice of accounting methods can be explained with the "bonus plan hypothesis", the "debt violation hypothesis" and the "political cost hypothesis" (Watts, Zimmerman 1986, 1990; Ozili 2017). When acompensation plan is applied, managers have the opportunity of selecting accounting methods/accruals to increase their utility subsequent to increase in the firm's performance (Watts, Zimmerman 1986; Beattie et al. 1994; Ozili 2017). This suggests that bank managers are bound to use LLPs to manage earnings in order to increase their own utility. For PAT debt violation hypothesis, the finance of banks' activities with more debts as represented by proportion of customers' deposits in banks' liability structure can prompt banks to reduce debt covenant violation through choice of accounting methods. The fact that bank threat of risk of

insolvency and violation of capital adequacy benchmark attract regulatory sanctions provides the link between PAT political cost hypothesis and use of LLPs to manage earnings and regulatory capital. The manager's choice of accounting methods can also be linked to attempts to communicate positive information about the entity via managerial efforts to meet analysts' forecast of earnings based on the assumptions of prospect theory (Halaoua et al. 2017). This indicates that PAT can also be used to explain bank managers' use of LLPs to signal financial strength.

Based on the above, the relationship between managerial discretions and loan loss provisions being examined in this study is premised on the assumptions of PAT which emphasises managerial choice of accounting methods in the provision of accounting information given managers' explicit contracts with the entity.

2.2. Previous empirical studies and hypotheses development

Since "bank managerial discretions" as a single measure is exclusive to this study, studies on the relationship between the components of managerial discretions and LLPs were reviewed. The review was limited to studies of the last decade since mandatory adoption of IFRSs globally appeared about two decades ago. In the literature it is shown that a positive relationship between LLPs and earnings before taxes and LLPs (EBTL) on one hand and LLPs and one-year-ahead change in EBTL (SIGN) onthe other hand indicate use of LLPs to smooth and signal earnings respectively. A negative relationship between LLPs and core/total regulatory capital ratio (CCAR/TRCAR) symbolises use of LLPs to manage capital (Salami 2021).

2.2.1. Managerial discretionary decisions and loan loss provisions

Japanese evidence provided by Kwak et al. (2009) revealed that banks use DLLP to manage capital but not to smooth earnings given the negative coefficient of measures of capital management and earnings smoothing.In contrast, results reported by Chang et al. (2008) for the Taiwan banking system showed smoothing of earnings via LLPs is attributed to the level of non-performing loans. Additionally, Chang et al. (2008) found that the attainment of deliberate increase in one-year-ahead changes in EBTL (SIGN) via DLLP indicating Taiwanese banks use DLLP to signal their financial strength. Annual firm-level data of Palestinian local banks for

the period 2006-2010 show that smoothing of earnings and regulatory capital via LLPs is not evident in the Palestinian banking system (Ashour 2011).

Both smoothing of earnings and management of capital via LLPs were found by Pinho and Martins (2009) using firm-level data of 27 banking groups in operation in Portugal between 1990 and 2000. Similar to the Portuguese scenario, Alali and Jaggi (2011) found that banks with higher earnings in the US report higher LLPs, rather indicating the use of LLPs to manage earnings in large banks while the coefficient of capital management is found to be significantly negative for undercapitalised banks. Also, significant positive and negative coefficients are found for the measures of earnings smoothing and capital management respectively by Floro (2010) from quarterly data of Philippine financial intermediaries obtained between 2001 and 2009. While the case of use of LLPs for earnings smoothing and capital management is also evident in the Malaysian context as reported by Misman and Ahmad (2011), the distinctions made between conventional and Islamic banks report lower coefficient of earnings smoothing and positive coefficient of capital management for Islamic banks. Further Malaysian evidence by Abdullah et al. (2013), Karimiyana et al. (2014) and Adzis et al. (2015) showsthe use of LLPs for various managerial discretionary decisions except for few mixed results. The positive coefficient of measure of capital management found by Abdullah et al. (2013) and Adzis et al. (2015) shows the lack of use of LLPs to manage capital while negative coefficient of measure of earnings signalling found by Adzis et al. (2015) indicates non-use of LLPs to signal financial strength of Malaysian commercial banks.

Despite using different measures of LLPs: LLPs normalised by total assets; LLPs on impaired loans normalised by total assets and LLPs on bad loans normalised by total assets; Alessi et al. (2014) found no evidence of use LLPs to smooth earnings by Italian banks. However, the test of use of LLPs to manage capital revealed non-conclusive evidence for LLPs and LLPs on bad loans with insignificant negative coefficient while no evidence is obtained for LLPs on impaired loans as coefficient of measure of capital management is significantly positive. Further Italian evidence which reinforces non-use of LLPs (in this case DLLP) to smooth earnings is obtained from the findings of Caporale et al. (2018).

Additional evidence by Caporale et al. (2018) confirmed the use of LLPs to signal strength by Italian banks though the coefficient is close to zero.

Empirical evidence to substantiate the use of LLPs to smooth earnings are reported by Skała (2014) in a Polish study using datasets of 360 Polish cooperative banks obtained between 2007 and 2012. Similar findings are also reported by Abdullah and Bujang (2016) for Thailand's banking system, as well as by Hasan and Wall (2014) from a panel dataset of US and non-US banks. From dichotomous measure of provisions and evidence from Middle East and North Africa (MENA) region, Olson and Zoubi (2014) found that banks in MENA region use LLPs rather than allowance for loan losses for earnings management but use allowance for loan losses rather than LLPs to signal strength while neither is used to manage capital. Ben Othman and Mersni (2014) found no difference in the use of LLPs to manage capital and smooth earnings using a sample of 72 banks consisting of conventional, Islamic and conventional with Islamic windows banks in the Middle East region. More so, in a joint Thailand and Japanese study, Abdullah et al. (2017) could only confirm use of LLPs for earnings management rather than capital management among banks in both countries.

Managerial discretionary use of LLPs for earnings smoothing is applied at a global pedestal by Bushman and Williams (2012) using panel datasets of banks from 27 countries. Earnings smoothing via LLPs is also observed in Turkish, Yemeni and Albanian banking by Acar and Ipci (2015), Shawtari et al. (2015) and Dushku (2016) respectively, except that the Yemeni case DLLP was used. However, a positive coefficient of measure of capital management found by Shawtari et al. (2015) and Dushku (2016) and negative coefficient of measure of earnings signalling found by Dushku (2016) shows non-use of LLPs (DLLP in the case of Yemeni banks) to manage capital and signal strength respectively. The empirical test of distinction between managerial discretionary use of LLPs in Euro Area (EA) and non-Euro Area (non-EA) by Curcio and Hasan (2015) revealed mixed findings. While capital management and earnings signalling are identifiable with non-EA banks, use of LLPs to smooth earnings is found to be peculiar to EA banks.

Except for South-Eastern European evidence provided by Shala and Toçi (2021), Jordanian, Brazilian, Tunisian, Kenyan and US evidence reported by Abu-

Serdaneh(2018), Schechtman and Takeda (2018), Zgarni and Fedhila (2019), Muriu and Josea (2020) and Tran et al. (2020) respectively confirmed use of LLPs to manage capital. The capital management of Jordanian banks is more pronounced using loan loss allowance than LLPs (Abu-Serdaneh 2018) whilethis was observed in banks with low regulatory capital ratio in Brazil (Schechtman, Takeda 2018). The use of DLLP to manage capital is reported by Tran et al. (2020). For discretionary use of LLPs to smooth earnings, positive coefficients of EBTL are reported by all the five studies, except for Abu-Serdaneh (2018) finding a negative coefficient of EBTL. However, coefficients of EBTL reported by Zgarni and Fedhila (2019) and Tran et al. (2020) is insignificantly positive, indicating inconclusive evidence. For discretionary use of LLPs for earnings signalling, Abu-Serdaneh's (2018) and Tran's et al. (2020) findings showed that US and Jordanian banks use loan loss allowance and DLLP to signal their financial strength, while use of LLPs for earnings signalling is not typical of all categories of Kenyan banks as reported by Muriu and Josea (2020).

The majority of evidence presented indicated the use of LLPs for various managerial discretionary decisions globally.This leads to the formulation of the study's first hypothesis (H_1):

H_1: Use of LLPs for various managerial discretionary decisions is characteristic of Nigerian DMBs.

2.2.2. Managerial discretions, loan loss provisions and bank riskiness

Empirical test of use of LLPs for managerial discretionary decisions by banks threatened by insolvency risk were carried out byLeventis et al. (2011, 2012). However, peculiarities of banks in solvency crisis can be comparedto problems faced by banks during financial crisis and when threatened by other forms of risk. This issue will be more deeply elaborated by reviewing studies relating managerial discretionary use of LLPs to financial crisis and other forms of risk than insolvency risk.

In the Chinese study of the listed and unlisted commercial banks by Curcio et al. (2014), the coefficient of income smoothing is found to be significantly positive during the period 2000–2012. This coincides to a larger extent with time of global

financial crisis. However, managing regulatory capital via LLPs was not prioritised by the banks the during global financial crisis. In Poland, the downturn period and extreme downturn period of annual unemployment growth rate of 2% and 3% respectively is found to be characterised by earnings smoothing via LLPs by Polish cooperative banks (Skała 2014). In Vietnam, Bryce et al. (2015) reported,using a panel dataset of Vietnamese banks between 2006 and 2012, that inclusion of risk control variables in relevant models reinforces counter-cyclical income smoothing and substantiates capital management hypothesis.Based on a sample of 564 listed US commercial banks, Ma and Song (2016) found a positive relationship between earnings smoothing and DLLP for banks in systemic crash and distress risk. Also, an earlier empiricalstudy by Alali and Jaggi (2011) showed that US commercial banks having high asset risk portfolio indulge in earnings smoothing via LLPs but only manage capital if undercapitalised. Further US evidence by El Sood (2012) revealed that accelerated provisions for the purpose of earnings smoothing is more pronounced in the pre-crisis period of 2002–2006 than crisis period of 2007–2009 for large US bank holding companies.

More so, a test of discretionary use of LLPs conducted by Dushku (2016) for Albanian banking confirmed practices of earnings smoothing via LLPs by Albanian foreign and domestic banks during the financial crisis of 2007–2009.During the financial crisis, and in spite of European Bank Authority's stress test for banks, Curcio et al. (2017) found the use of LLPs for earnings smoothing by EA banks, but inconclusive evidence of capital managementIn Jordanian, the economic situation prompted by global financial crisis was not a reason for banks to indulge in discretionary smoothing of earnings via LLPs (Abu-Serdaneh2018). Earlier evidence of discretionary use of LLPs for managerial decisions by European commercial banks as contained in the findings of Leventis et al. (2011, 2012) showed how solvency crisis of banks prompt discretionary use of LLPs. The positive and negative coefficients of measures of earnings smoothing and capital management respectively, when interacting with solvency risk in relevant models, confirm that evidence of discretionary use of LLPs for earnings and capital management though capital management is inconclusive given its insignificant coefficient (Leventis et al. 2011). Similar findings are also reported by Leventis et

al. (2012) in the test of discretionary use of LLPs for earnings signalling by European commercial banks facing troubles, because of significantly positive coefficient of SIGN when interacting with solvency risk. Ozili (2021) reported that African banks audited by "Big 4" auditors' have stronger incentives to use discretions imbedded in LLPs to smooth earnings during a financial crisis, as higher returns are considerably reduced during recession using income smoothing techniques.

The evidence shows crises of various forms, including solvency crisis,provides incentives for discretionary use of LLPs for managerial discretions. Based on this, the study's second hypothesis (H_2) is:

H_2: Use of LLPs for various managerial discretionary decisions is characteristic of Nigerian DMBs threatened by risk of insolvency.

2.2.3. Managerial discretions, loan loss provisions and IFRSs

The claims of improved corporate disclosure and transparency when entities report in IFRSs form part of motivation for conductingempirical studies (see, for instance, Adzis et al. 2016; Ozili, Outa 2019; Salami 2021; Uthman, Salami 2021). Like accounting standards regime change, change in regulatory regime also provides rationale for empirical test of possible improved financial reporting quality subsequent to regulatory reforms as evident in loan loss accounting literature (Rosvold 2017; Chen et al. 2021; Nikulin, Downing 2021). Therefore, relevant previous studies on how changes in accounting and regulatory reforms improve use of LLPs for managerial discretionary decisionsare reviewed.

Two studies on whether improvement in discretionary use of LLPs for earnings and capital management is typical of Spanish banks subsequent to adoption of dynamic/statistical provisioning was conducted byPérez et al. (2008, 2011). They showed that earnings smoothing practices via LLPs became less pronounced given its significantly negative coefficient subsequent to the implementation of new provisioning technique. Evidence of non-use of LLPs to manage regulatory capital is also reported by Pérez et al. (2008) following the application of dynamic provisioning rules in Spain in the year 2000. However, subsequent evidence provided by Carbo-Valverde and Rodriguez-Fernandez (2018) revealed that

reduction is noticeable in use of LLPs for capital management rather than earnings management. The empirical investigation of whether the new Basel standard called Basel III brings about improvement in managerial discretionary use of LLPs for earnings smoothing by Rosvold (2017), using a panel dataset of 75 listed commercial banks in 22 European countries, resulted in affirmation. In contrast, Chinese evidence reported by Chen et al. (2021) could not establish any difference in Chinese banks' earnings smoothing practices following implementation of Basel III as the practice is found to persist in the new regime. As further established, implementation of Basel III induced listed Chinese banks to manage core capital (CCAR) while no evidence of use of LLPs to signal strength is identifiable with Chinese banks pre and post-Basel III adoption (Chen et al. 2021). In the Italian context, Caporaleet al. (2018) found that banks in Italy do not use DLLP to smooth earnings when dynamic provisioning approach was adopted in Italy. In Russia, an overhaul in regulation and supervision of Russian banks by Russian central bank is not found to bring about any improvement in the use of LLPs to smooth earnings and regulatory capital via LLPs as reported by Nikulin and Downing (2021). However, Nikulin and Downing's (2021) evidence of capital management by Russian banks in the post-reform regulation and Russian central bank's supervisory role is noticeable with private banks rather than State-owned banks.

Earlier workbyvanOosterbosch (2009) and Gebhardt and Novotny-Farkas (2011) provides support for non-use of LLPs for earnings smoothing given negative coefficient of EBTL upon adoption of IFRSs in the European context. In contrast, positive coefficient of EBTL is found by Leventis et al. (2011), Norden and Stoian (2013) and Duru and Tsitinidis (2013) but with lower/insignificant coefficient of EBTL in the IFRS period relative to pre-IFRS period for EU, Dutch and Nordic banking respectively. For discretionary use of LLPs for capital management, lower negative coefficient of CCAR is reported by Leventis et al. (2011) post-IFRS suggesting reduction in the discretionary use of LLPs to manage capital by European commercial banks upon adoption of IFRSs. For earnings signalling, findings of Leventis et al. (2012) for EU listed commercial banks favour discretionary use of LLPs to signal their financial strength upon adoption of IFRSs while Attia et al. (2013) found a reduction in banks in MENA countries propensity to signal over

smoothing of earnings based on significantly negative coefficient of SIGN. More so, IFRS reporting ensures non-use of LLPs to manage capital and smooth earnings by banks in solvency crisis given insignificantly positive coefficient and significantly negative respectively of both measures (Leventis et al. 2011).TroubledEU commercial banks incentive to signal via LLPs increases with mandatory reporting in IFRSs (Leventis et al. 2012).

The superiority of national generally accepted accounting principles (GAAPs) over IFRSs was found by Ashraf et al. (2015) when testing discretionary use of LLPs to smooth earnings by the banks in the Organisation of Islamic Cooperation (OIC). However, Adzis et al. (2016) and Arbak (2017) found that earnings smoothing coefficient becomes insignificantly positive and/or significantly negative subsequent to reporting in International Accounting Standard (IAS) 39 by Honk Kong and Belgian banks respectively. Further researchbyArbak (2017) revealed mixed findings of the use of LLPs for capital management as the practice is evident using panel fixed-effects model but inconclusive using dynamic panel model of generalized method of moment (GMM) technique with or without interaction of IAS 39. While evidence of discretionary use of LLPs for capital management exists for Belgium, the earnings signalling is not typical of credit institutions in Belgium with or without interaction of IFRSs.

Ozili and Outa (2018) consider use of LLPs to smooth earnings as typical of banks that report in IFRSs and are audited by “Big 4” auditors based on panel dataset of 30 South African-based banks for the period 2002-2014. Though Ashraf et al. (2019) found that banks across 118 countries indulge in use of LLPs to smooth earnings while reporting in principles-based accounting standards (IFRSs), the finding is inconclusive given insignificantly positive coefficient of measure of earnings smoothing when interacting with principles-based accounting standards. The insignificantly positive coefficient of core capital ratio when interacted with principles-based against rules-based accounting standards is evident of non-use of LLPs for capital management (Ashraf et al. 2019). A similar improvement in the discretionary use of LLPs is also noticeable with insignificantly positive coefficient of SIGN when interacted with principles-based accounting standards indicating imminent use of LLPs to signal. Although higher coefficient of determination is

found for models with Brazilian Central Bank's accounting rules,Galdi et al. (2021) found no difference in the use of LLPs for earnings smoothing by Brazilian banks when distinction is made between reporting in IAS 39 and Brazilain Central Bank's accounting principles which are based on mixed loan loss model.

In Nigeria, significantly positive coefficients of interactions of IFRS with EBTL and SIGN found by Ozili (2015) represent discretionary use of LLPs by DMBs to manage and signal earnings upon IFRS adoption while significantly negative coefficient of CCAR post-IFRS indicates use of LLPs to manage capital. However, evidence provided by Ozili (2015) for the use of LLPs for managerial discretionary decisions is for the pre-IFRS periodprior to 2012, when reporting in IFRS was not mandatory. The use of LLPs to smooth earnings is also observed by Eneje et al. (2016) with or without the interaction of IFRS although for the mandatory IFRS period in Nigeria. Findings of Atoyebi and Simon (2018) showed significantly positive coefficient of EBTL in both pre and post-IFRS periods with higher coefficient in post-IFRS period while coefficient of measure capital management in both periods is insignificantly positive. In contrast, Ozili and Outa (2019) empirical analysis revealed non-use of LLPs for earnings smoothing by Nigerian DMBs in the mandatory IFRS period.

The above evidence reports preponderance of findings confirming the improvement in managerial discretionary use of LLPs subsequent to the adoption of IFRSs and/or change in accounting rule. Therefore, the third hypothesis (H_3) and fourth hypothesis (H_4) of the study are as follows:

H_3: There is improvement (reduction) in the managerial discretionary use of LLPs by Nigerian DMBs upon adoption of IFRSs.

H_4: There is improvement in the managerial discretionary use of LLPs by Nigerian DMBs in solvency crisis upon adoption of IFRSs.

3. Materials and methods

To establish the extent of use of LLPs for various managerial discretionary decisions, annual bank-level data related to measures of managerial discretions,

LLPs, bank riskiness and IFRSs were hand-collected from the annual reports of a sample 16 Nigerian DMBs between 2007 and 2017. This period incorporates substantially pre-IFRS and IFRS periods in Nigeria. Data were obtained over a period of time for a number of depository financial institutions because longitudinal research design is the most appropriate for the study. The beginning period of data collection (2007) is so unique that it marked the commencement of the disclosures of bank capital adequacy ratios in the Nigerian DMBs' financial statements based on regulatory directives. In addition, 2017 for which data collection was halted marked the end of accounting for loan losses using the requirements of IAS 39. Thus, data collection after 2017 is beyond the purpose of this study as switching to IFRS 9: *Financial Instrument*; based on expected loan loss model from IAS 39: *Financial Instruments: Recognition and Measurement*; based on incurred loan loss model was executed.

The selection of a sample of 16 DMBs out of population of 26 DMBs as at 31 December 2018 (CBN 2018) was based on accessibility to relevant data. Therefore, DMBs having their financial reports in public domain whether listed or unlisted were included in the sample. For a DMB to be included, it must have financial reports covering not less than 60% of the study's sampled period. Three DMBs which would have been ordinarily excluded were included in the sample using the criteria set. One listed DMB which has been acquired by another listed DMB but has financial information covering the entire sampled period of the study. Another which is a subsidiary of a foreign bank though unlisted chooses to make its financial information available to the public while the third DMB has been delisted and acquired by private investors but has financial information covering more than 60% of the study's sampled period.

The data analysis was performed descriptively and inferentially. Descriptive statistics performed to identify distinct characteristics of the study's variables include mean, median, standard deviation, range and principal component analysis (PCA). PCA, which is a statistical tool for data condensation and classification to derive a new set of variables smaller than the original set of variables but not without retaining the original information (Petrovska, Mihajlovska 2013), was used

to construct the bank managerial discretions index (MDI), the study's major explanatory variable.

The Z-score is used to measure bank's distance to default because it has indirect relationship with bank's insolvency risk ((Demirgüç-Kunt, Huizinga 2010; Bustamanet al. 2017). Unlike MDI, the Z-score was derived mathematically following previous studies (Demirgüç-Kunt, Huizinga 2010; Salami 2018) as follows:

$$Z - SCORE_{it} = \frac{SHFD_{it} + RAST_{it}}{\sigma RAST_{i\rho}} - (1)$$

Where: SHFD = shareholders' funds otherwise known as total equity scaled by total assets, RAST = returns on asset, that is, profit after tax scaled by total assets, σRAST = standard deviation of RAST, ί stands for each DMB; t = each year of the sample period; ρ = the whole sample period.

Based on the derivation of Z-score, a higher Z-value means that the bank is more solvent or stable while a low or negative score is a sign of a (possible) insolvency crisis (Salami 2018). Using the approach of Leventis et al. (2011, 2012), identifying banks threatened by risk of insolvency involves ascribing higher probability of default to banks having Z-score lower than the median Z-score in a group of banks.

To test the study's hypotheses, panel regression analysis was applied. The approach followed in panel model technique favoured Panel Corrected Standard Errors (PCSE) more than other static panel regression techniques. This procedure involves making a choice between panel fixed-effects (Panel FE) model and random-effects model (Panel RE) using Hausman test (HUS). If the result of HUS statistics is significant at $p<0.05$, the choice of Panel FE is made. If otherwise, Panel RE is appropriate. The choice of Panel RE allows for a further test of Breusch-Pagan Lagrange Multiplier test (LM) to choose between Panel RE and Pooled OLS. The insignificance of LM statistics suggests the choice of Pooled OLS. The process of choosing appropriate panel model can be augmented after a choice of either Panel FE or Pooled OLS by testing for presence of heteroscedasticity and autocorrelation (Blackwell 2005). Following this procedure, the choice of PCSE or panel Feasible Generalised Least Square (Panel FGLS) is made in models with disturbances having

heteroscedasticity, autocorrelation and/or contemporaneous autocorrelation (Beck, Katz 1995; Solano et al. 2020). The application of Panel FGLS is appropriate when datasets are balanced while PCSE is best suited for both balanced and unbalanced datasets (Solano et al. 2020). To adopt PCSE, the unbalanced panel datasets are expected to have higher number of cross-sections than length of time for data collection (N>T) as evident in this study. These procedures favour the adoption of Prais-Winsten regression with correlated PCSE (PW-PCSE) in all the study's regression models presented. These are presented in Tables 8, 10 and 11 where the procedures reinforce the application of Panel FE with robust standard errors (Panel FE with RSE) in one model each. In Table 9, the choice of Pooled OLS with RSE was appropriate for two regression models. Nevertheless, the appropriateness of all the models was confirmed by Wald Statistics (Wald) for PW-PCSE and F-statistics (F-test) for Panel FE and Pooled OLS at a 5% level of significance.Also, the level of multi-collinearity among the study's explanatory variables was established using pairwise correlation analysis.

3.1. Study's econometric models

Since managerial discretion is the study's major independent variable, a derivation of MDI was made from the measures of earnings smoothing, capital management and earnings signalling using PCA as follows:

$$MDI_{it} = \delta_1 CCAR_{it} + \delta_2 TRCAR_{it} + \delta_3 EBTL_{it} + \delta_4 SIGN_{it} \quad (2)$$

In equation (2), MDI_{it} represents an index of bank managerial discretions of DMB 'i' at time't'; where 'i' ranges from 1–16 and 't' ranges from 2007–2017. δ is the eigenvector or factor loading used as the weight of each variable to calculate MDI. Other than MDI, the measurement and definitions of variables included in equation (2) are presented in Appendix.

Following practices in the previous studies, using LLPs as dependent variable can be in two forms of reported LLPs (TLLP) and abnormal/discretionary LLPs (DLLP) (Kanagaretnam et al. 2003; Kwak et al. 2009; Leventis et al. 2011, 2012; Tran et al. 2020; Salami 2021). However, testing use of DLLP for various managerial discretionary decisions requires separating LLPs into non-discretionary and discretionary components (Kanagaretnam et al. 2003; Salami 2021). Therefore,

following the approach of Kanagaretnam et al. (2003), DLLP is derived using an estimation of non-discretionary component as follows:

$$LLP_{it} = \beta_0 + \beta_1 NPL_{it-1} + \beta_2 CHNPL_{it} + \beta_3 CHLOAN_{it} + \varepsilon_{it} \quad (3)$$

Where:

LLP_{it}= provision for loan losses scaled by beginning loans;

NPL_{it-1} = beginning of period nonperforming loans scaled by beginning loans;

$CHNPL_{it}$= change in the value of nonperforming loans scaled by beginning loans;

$CHLOAN_{it}$= change in value of loans scaled by beginning loans.

The regressors in equation (3) account for non-discretionary components of LLPs while the residual term represents DLLP.

Using DLLP as dependent variable alongside with TLLP is facilitated upon the derivation of DLLP from equation (3). Therefore, to test whether use of LLPs for various managerial discretionary decisions as embedded in MDI without the moderating influence of IFRS adoption and bank riskiness, the following equations with TLLP and DLLP as dependent variables were estimated to test the study's first hypothesis (H_1):

$$TLLP_{it} = \propto_0 + \propto_1 MDI_{it} + \propto_2 \Delta NPL_{it} + \propto_3 LEV_{it} + \propto_4 LgTA_{it} + \propto_5 LST_{it} + \mu_{it} \quad (4a)$$

$$DLLP_{it} = \propto_0 + \propto_1 MDI_{it} + \propto_2 LTA_{it} + \propto_3 LEV_{it} + \propto_4 LgTA_{it} + \propto_5 LST_{it} + \mu_{it} \quad (4b)$$

While MDI as contained in equations (4a) and (4b) is unique in the LLPs literature, other variables which are controlled for are based on deductions from previous studies (Ahmed et al.1999; Ghosh 2007; Curcio, Hasan 2015; Elnahass et al. 2018).

To test the interaction of risk of insolvency and adoption of IFRSs in the use of LLPs for managerial discretionary decisions, the procedures of a number of previous studies (Leventis et al. 2011, 2012; Ozili, Outa 2018; Ashraf et al. 2019) which had empirically tested how bank IFRS adoption and/or bank riskiness influence use of LLPs for managerial discretions were followed. The resulting econometric models with TLLP and DLLP as dependent variables were specified in the equations 4(c) and 4(d) as follows:

$$TLLP_{it} = \propto_0 + \propto_1 MDI_{it} + \propto_2 IFRS_{it} + \propto_3 (IFRS * MDI)_{it} + \propto_4 SVR_{it} + \propto_5 (SVR * MDI)_{it} + \propto_6 (IFRS * SVR * MDI)_{it} + \propto_7 \Delta NPL_{it} + \propto_8 LEV_{it} + \propto_9 LgTA_{it} + \propto_{10} LST_{it} + \mu_{it} - - - - - - - - - (4c)$$

$$DLLP_{it} = \propto_0 + \propto_1 MDI_{it} + \propto_2 IFRS_{it} + \propto_3 (IFRS * MDI)_{it} + \propto_4 SVR_{it} + \propto_5 (SVR * MDI)_{it} + \propto_6 (IFRS * SVR * MDI)_{it} + \propto_7 LTA_{it} + \propto_8 LEV_{it} + \propto_9 LgTA_{it} + \propto_{10} LST_{it} + \mu_{it} - - - - - - - - - (4d)$$

The measurement and definitions of variables included in equations 4a, 4b, 4c and 4d are presented in Table 1.

Table 1.Definitions and measurement of variables

S/N	Notation	Variable name	Description
1	$TLLP_{it}$	Reported Loan Loss Provisions	Ratio of LLPs scaled by gross loans
2	$DLLP_{it}$	Abnormal/Discretionary LLPs	Residual of equation (3)
3	MDI_{it}	Managerial Discretions Index	Index of bank managerial discretions derived from equation (2) using PCA
4	$IFRS_{it}$	IFRS reporting	Dummy variable (1) for IFRS reporting and (0) otherwise
5	SVR_{it}	Solvency risk	Dummy variable (1) for bank with z-score below median z-score of all sampled banks and (0) otherwise
6	IFRS*MDI_{it}	IFRS and MDI	Interaction of managerial discretion index with reporting regime
7	SVR*MDI_{it}	Solvency risk and MDI	Interaction of managerial discretion index with solvency risk status
8	IFRS*SVR*MDI_{it}	IFRS, Solvency risk and MDI	Interaction among IFRS, risk level and managerial discretions
9	ΔNPL_{it}	Change in non-performing loans	Difference between current and previous years non-performing loans scaled by previous year non-performing loans
10	LTA_{it}	Credit risk	Ratio of total loans to total assets
11	LEV_{it}	Leverage of Banks	Ratio debts to equity
12	$LgTA_{it}$	Size	Natural Logarithm of total assets
13	LST_{it}	Listing status	Dummy variable (1) for bank listed in other clime, (0) otherwise

Source:author's compilation (2020) based on deductions from related literature and conceptual framework.

Since MDI is a derivation from CCAR, TRCAR, EBTL and SIGN as specified in equation (2) and empirical test of use of LLPs for each attribute is still evident in the literature (Muriu,Josea 2020; Chen et al. 2021; Le et al. 2021; Nikulin, Downing 2021), econometric models were also specified for use of LLPs for earnings smoothing, capital management and earnings signalling. These models for each component given TLLP and DLLP as dependent variables are as follows:
For use of LLPs to smooth earnings:

$$TLLP_{it} = \propto_0 + \propto_1 EBTL_{it} + \propto_2 \Delta NPL_{it} + \propto_3 LEV_{it} + \propto_4 LgTA_{it} + \propto_5 LST_{it} + \mu_{it} \quad (5a)$$

$$DLLP_{it} = \propto_0 + \propto_1 EBTL_{it} + \propto_2 LTA_{it} + \propto_3 LEV_{it} + \propto_4 LgTA_{it} + \propto_5 LST_{it} + \mu_{it} \quad (5b)$$

$$TLLP_{it} = \propto_0 + \propto_1 EBTL_{it} + \propto_2 IFRS_{it} + \propto_3 (IFRS * EBTL)_{it} + \propto_4 SVR_{it} + \propto_5 (SVR * EBTL)_{it} + \propto_6 (IFRS * SVR * EBTL)_{it} + \propto_7 \Delta NPL_{it} + \propto_8 LEV_{it} + \propto_9 LgTA_{it} + \propto_{10} LST_{it} + \mu_{it} \quad (5c)$$

$$DLLP_{it} = \propto_0 + \propto_1 EBTL_{it} + \propto_2 IFRS_{it} + \propto_3 (IFRS * EBTL)_{it} + \propto_4 SVR_{it} + \propto_5 (SVR * EBTL)_{it} + \propto_6 (IFRS * SVR * EBTL)_{it} + \propto_7 LTA_{it} + \propto_8 LEV_{it} + \propto_9 LgTA_{it} + \propto_{10} LST_{it} + \mu_{it} \quad (5d)$$

For use of LLPs to manage capital:

$$TLLP_{it} = \propto_0 + \propto_1 CCAR_{it} + \propto_2 TRCAR_{it} + \propto_3 \Delta NPL_{it} + \propto_4 LEV_{it} + \propto_5 LgTA_{it} + \propto_6 LST_{it} + \mu_{it} \quad (6a)$$

$$DLLP_{it} = \propto_0 + \propto_1 CCAR_{it} + \propto_2 TRCAR_{it} + \propto_3 LTA_{it} + \propto_4 LEV_{it} + \propto_5 LgTA_{it} + \propto_6 LST_{it} + \mu_{it} \quad (6b)$$

$$TLLP_{it} = \propto_0 + \propto_1 CCAR_{it} + \propto_2 TRCAR_{it} + \propto_3 IFRS_{it} + \propto_4 (IFRS * CCAR)_{it} + \propto_5 (IFRS * TRCAR)_{it} + \propto_6 SVR_{it} + \propto_7 (SVR * CCAR)_{it} + \propto_8 (SVR * TRCAR)_{it} + \propto_9 (IFRS * SVR * CCAR)_{it} + \propto_{10} (IFRS * SVR * TRCAR)_{it} + \propto_{11} \Delta NPL_{it} + \propto_{12} LEV_{it} + \propto_{13} LgTA_{it} + \propto_{14} LST_{it} + \mu_{it} \quad (6c)$$

$$DLLP_{it} = \propto_0 + \propto_1 CCAR_{it} + \propto_2 TRCAR_{it} + \propto_3 IFRS_{it} + \propto_3 (IFRS * CCAR)_{it} + \propto_5 (IFRS * TRCAR)_{it} + \propto_6 SVR_{it} + \propto_7 (SVR * CCAR)_{it} + \propto_8 (SVR * TRCAR)_{it} + \propto_9 (IFRS * SVR * CCAR)_{it} + \propto_{10} (IFRS * SVR * TRCAR)_{it} + \propto_{11} LTA_{it} + \propto_{12} LEV_{it} + \propto_{13} LgTA_{it} + \propto_{14} LST_{it} + \mu_{it} \quad (6d)$$

For use of LLPs to signal financial strength:

$$TLLP_{it} = \propto_0 + \propto_1 SIGN_{it} + \propto_2 \Delta NPL_{it} + \propto_3 LEV_{it} + \propto_4 LgTA_{it} + \propto_5 LST_{it} + \mu_{it} \quad (7a)$$

$$DLLP_{it} = \propto_0 + \propto_1 SIGN_{it} + \propto_2 LTA_{it} + \propto_3 LEV_{it} + \propto_4 LgTA_{it} + \propto_5 LST_{it} + \mu_{it} \quad (7b)$$

$$TLLP_{it} = \propto_0 + \propto_1 SIGN_{it} + \propto_2 IFRS_{it} + \propto_3 (IFRS * SIGN)_{it} + \propto_4 SVR_{it} + \propto_5 (SVR * SIGN)_{it} + \propto_6 (IFRS * SVR * SIGN)_{it} + \propto_7 \Delta NPL_{it} + \propto_8 LEV_{it} + \propto_9 LgTA_{it} + \propto_{10} LST_{it} + \mu_{it} \quad (7c)$$

$$DLLP_{it} = \propto_0 + \propto_1 SIGN_{it} + \propto_2 IFRS_{it} + \propto_3 (IFRS * SIGN)_{it} + \propto_4 SVR_{it} + \propto_5 (SVR * SIGN)_{it} + \propto_6 (IFRS * SVR * SIGN)_{it} + \propto_7 LTA_{it} + \propto_8 LEV_{it} + \propto_9 LgTA_{it} + \propto_{10} LST_{it} + \mu_{it} \quad (7d)$$

4. Results and discussion

4.1. Descriptive statistics

Following the approach of Leventis et al. (2011, 2012) and Curcio et al. (2017), the study's descriptive statistics are presented based on change in accounting regime and riskiness of Nigerian DMBs. The statistics are presented in Tables 2 and 3 with respect to IFRS adoption and DMBs' solvency risk respectively. MDI and DLLP included in Tables 2 and 3 are based on deductions from results of PCA (presented in Tables 5 and 6) and results of Praise-Winsten OLS (Praise-OLS) (presented in Table 7). The ADLLP is the absolute value of DLLP.

As presented inTable 2, the positive value of mean of MDI is an indication of use of discretions imbedded in LLPs by Nigerian DMBs. However, its closeness to zero shows that the practice is at the low ebb. Nevertheless, mean of MDI is positive and higher (0.16) pre-IFRS period compared to negative index (-0.13) during IFRS period. This is also corroborated by higher maximum (minimum) value of 1.55 (-3.80) pre-IFRS period compared to lower 0.74 (-10.05) during IFRS. Regardless of similar median value, there is higher incurrence of LLPs during IFRS with mean TLLP of 0.06 compared to pre-IFRS of 0.04. This might be related to higher earnings before taxes and LLPs (EBTL) of mean value of 0.03 during IFRS than 0.02 pre-IFRS. This suggests the likelihood of use of LLPs for earnings smoothing during IFRS. On the whole, Nigerian DMBs indulge in income-increasing earnings smoothing given the negative mean (median) of DLLP for the entire sampled period. This is also the case for Nigerian DMBs during IFRS. However, pre-IFRS, Nigerian DMBs' provisioning practices range between income-increasing and income-decreasing earnings smoothing given positive and negative mean and median values respectively. If ADLLP is considered, higher mean value (maximum value) of 0.04

(0.30) pre-IFRS compared to 0.02 (0.07) during IFRS reinforces higher level of use of discretions or earnings smoothing pre-IFRS. In terms of capital adequacy, Nigerian DMBs appear to be better capitalised pre-IFRS given higher mean, median and maximum values of 17%, 20% and 48% for core capital (CCAR) respectively and 21%, 22% and 51% for total regulatory capital (TRCAR) respectively compared to 13%, 15% and 34% for CCAR and 15%, 18% and 34% for TRCAR respectively during IFRS. There is also considerable use of LLPs for signalling by Nigerian DMBs pre-IFRS given non-zero mean and median values of one-year-ahead changes in EBTL (SIGN) and higher maximum value of SIGN during IFRS. Other variables and summary statistics are as presented in Table 2.

As shown inTable 3, all the descriptive statistics of the study's variables appear to favour less risky DMBs against the riskier ones. However, the level of discretionary use of LLPs is higher for less risky DMBs given positive MDI scores of 0.36, 0.28 and 1.55 for mean, median and maximum values respectively against -0.36, -0.07 and 1.19 respectively for riskier DMBs. Also, the argument of higher EBTL prompting higher LLPs charge cannot be substantiated as riskier DMBs with lower EBTL have higher TLLP as depicted in Table 3. It is also evident that the level of signalling of riskier and less risky DMBs appears similar; however, with a mean value of 0.1 for SIGN of less risky DMBs, less risky DMBs attach more importance to signalling via LLPs. There is also statistical evidence that a higher change in non-performing loans (ΔNPL) is identifiable with less risky DMBs as ΔNPL mean, median and maximum values of 0.70, 0.15 and 8.11 respectively are higher than 0.38, 0.11 and 5.79 respectively for riskier Nigerian DMBs. While the Z-score is not included in any of the study's econometric models, its inclusion in Tables 2 and 3 is a basis for categorisation of Nigerian DMBs into riskier and less risky banks. Other descriptive statistical results are presented in Table 3.

Table 2.Descriptive statistics based on reporting regime

	Variable	TLLP	DLLP	ADLLP	MDI	CCAR	TRCAR	EBTL	SIGN	ΔNPL	LTA	LEV	LgTA	LST	ZSCORE
FULL SAMPLE PERIOD (169)	Mean	0.05	-0.00	0.03	0.00	0.15	0.18	0.03	0.00	0.54	0.45	7.47	20.67	0.33	14.84
	Std. Dev.	0.23	0.05	0.04	1.00	0.24	0.22	0.03	0.03	1.54	0.13	14.94	0.85	0.47	10.64
	Median	0.02	-0.01	0.02	0.07	0.16	0.20	0.03	0.00	0.13	0.45	6.05	20.76	0.00	15.29
	Min	-0.28	-0.30	0.00	-10.05	-1.98	-1.98	-0.20	-0.15	-0.99	0.06	-9.64	18.68	0.00	-38.34
	Max	2.93	0.29	0.30	1.55	0.48	0.51	0.09	0.16	8.11	1.01	191.21	22.45	1.00	43.08
PRE-IFRS PERIOD (76)	Mean	0.04	0.00	0.04	0.16	0.17	0.21	0.02	0.01	0.84	0.45	6.09	20.29	0.26	16.53
	Std. Dev.	0.06	0.07	0.06	0.76	0.23	0.16	0.04	0.04	2.01	0.14	6.49	0.76	0.44	11.83
	Median	0.02	-0.01	0.02	0.20	0.20	0.22	0.03	0.01	0.10	0.42	5.10	20.28	0.00	17.13
	Min	-0.28	-0.30	0.00	-3.80	-0.97	-0.64	-0.20	-0.15	-0.77	0.18	-9.64	18.68	0.00	-4.93
	Max	0.31	0.29	0.30	1.55	0.48	0.51	0.06	0.16	8.11	1.01	35.03	21.77	1.00	43.08
IFRS PERIOD (93)	Mean	0.06	-0.00	0.02	-0.13	0.13	0.15	0.03	0.00	0.30	0.45	8.60	20.98	0.38	13.46
	Std. Dev.	0.30	0.02	0.01	1.15	0.24	0.25	0.02	0.02	0.95	0.11	19.25	0.80	0.49	9.39
	Median	0.02	-0.01	0.02	0.00	0.15	0.18	0.03	0.00	0.15	0.46	6.51	20.95	0.00	14.38
	Min	-0.02	-0.04	0.00	-10.05	-1.98	-1.98	-0.03	-0.08	-0.99	0.06	-1.65	18.87	0.00	-38.34
	Max	2.93	0.07	0.07	0.74	0.34	0.34	0.09	0.10	6.91	0.77	191.21	22.45	1.00	29.52

Source:authors' computation (2020) based on STATA 14 outputs.

Table 3.Descriptive statistics based on DMBs' riskiness

	Variable	TLLP	DLLP	ADLLP	MDI	CCAR	TRCAR	EBTL	SIGN	ΔNPL	LTA	LEV	LgTA	LST	ZSCORE
ALL SAMPLE BANKS (169)	Mean	0.05	-0.00	0.03	0.00	0.15	0.18	0.03	0.00	0.54	0.45	7.47	20.67	0.33	14.84
	Std. Dev.	0.23	0.05	0.04	1.00	0.24	0.22	0.03	0.03	1.54	0.13	14.94	0.85	0.47	10.64
	Median	0.02	-0.01	0.02	0.07	0.16	0.20	0.03	0.00	0.13	0.45	6.05	20.76	0.00	15.29
	Min	-0.28	-0.30	0.00	-10.05	-1.98	-1.98	-0.20	-0.15	-0.99	0.06	-9.64	18.68	0.00	-38.34
	Max	2.93	0.29	0.30	1.55	0.48	0.51	0.09	0.16	8.11	1.01	191.21	22.45	1.00	43.08
RISKIER BANKS (84)	Mean	0.07	0.01	0.04	-0.36	0.05	0.10	0.02	0.00	0.38	0.44	9.60	20.46	0.36	6.59
	Std. Dev.	0.32	0.07	0.06	1.27	0.29	0.27	0.04	0.04	1.20	0.14	20.98	0.87	0.48	7.47
	Median	0.03	-0.00	0.02	-0.07	0.13	0.17	0.03	0.00	0.11	0.43	7.28	20.68	0.00	7.19
	Min	-0.28	-0.30	0.00	-10.05	-1.98	-1.98	-0.20	-0.15	-0.99	0.06	-9.64	18.68	0.00	-38.34
	Max	2.93	0.29	0.30	1.19	0.25	0.44	0.09	0.16	5.79	1.01	191.21	22.28	1.00	14.94
LESS RISKY BANKS (85)	Mean	0.02	-0.01	0.02	0.36	0.24	0.26	0.04	0.01	0.70	0.45	5.36	20.87	0.29	22.99
	Std. Dev.	0.02	0.02	0.01	0.36	0.08	0.08	0.01	0.02	1.81	0.11	1.52	0.79	0.46	5.99
	Median	0.01	-0.01	0.02	0.28	0.23	0.24	0.04	0.00	0.15	0.46	5.66	20.80	0.00	22.11
	Min	-0.01	-0.09	0.00	-0.11	0.12	0.16	0.00	-0.04	-0.76	0.17	2.50	19.20	0.00	15.29
	Max	0.08	0.04	0.09	1.55	0.48	0.51	0.07	0.05	8.11	0.65	9.75	22.45	1.00	43.08

Source:authors' computation (2020) based on STATA 14 outputs.

4.2. Correlation analysis

The correlation matrix presented in Table 4 shows the pairwise correlation among the study's non-interaction explanatory variables.[1] If the benchmark correlation coefficient of ≥0.80 at which multi-collinearity problem can set in (Brooks 2008) is considered the inclusion of CCAR and MDI, TRCAR and MDI and TRCAR and CCAR in the same model is not feasible. However, given a separate specification of each in the study's models for hypotheses testing, problem of multi-collinearity does not in any way arise.

Table 4.Correlation matrix

Variable	MDI	CCAR	TRCAR	EBTL	SIGN	ΔNPL	LTA	LEV	LgTA	LST
MDI	1.00									
CCAR	0.88*	1.00								
TRCAR	1.00*	0.88*	1.00							
EBTL	0.15*	0.27*	0.15*	1.00						
SIGN	0.04	0.06	0.04	-0.52*	1.00					
ΔNPL	0.06	0.11	0.06	0.02	0.00	1.00				
LTA	-0.07	-0.08	-0.07	-0.28*	0.18*	0.18	1.00			
LEV	-0.09	-0.07	-0.09	-0.07	0.04	-0.05	-0.12	1.00		
LgTA	0.23*	0.30*	0.23*	0.27*	-0.04	-0.05	0.03	-0.12	1.00	
LST	0.06	0.09	0.06	0.16*	0.02	0.03	0.10	-0.03	0.47*	1.00

Source:authors' computation (2020) based on STATA 14 outputs. * indicates significance at 95% confidence level.

4.3. Principal component analysis

The use of MDI as an independent variable was facilitated through condensation of CCAR, TRCAR, EBTL and SIGN using PCA as specified in equation (2). The results of PCA that facilitated the estimation of MDI are presented in Tables 5 and 6.

[1]Non-interaction variables are the study's main variables. The product of the independent variables and moderating variables amount to interaction variables. So, the interaction variables are derived from the products of two or more explanatory variables.In studies involving interaction terms or variables, only non-interaction variables are analysed descriptively. See, for instance, Leventis et al. (2011, 2012) and Curcio et al. (2017).

Table 5.Principal components eigenvalue and proportion for managerial discretions index

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	1.98014	.50831	0.4950	0.4950
Comp2	1.47183	1.0282	0.3680	0.8630
Comp3	.443632	.33924	0.1109	0.9739
Comp4	.104392	.	0.0261	1.0000

Source:authors' computation (2020) based on STATA 14 outputs.

In Tables 5 and 6, the computation of eigenvalues and eigenvectors (factor loadings) respectively to identify and determine the component with the highest proportion and the weight of each variable ispresented. As shown inTable 5, the first principal component (factor) has an eigenvalue of 1.98 and explained 49.5% of total variation. The second and third factors have eigenvalues of 1.47 and 0.44 and explained 36.8% and 11.1% of total variation respectively, while the fourth principal component has an eigenvalue 0.1 and explained 2.6% of total variation. Although both first and second principal components have eigenvalues higher than 1, the factor loadings of first principal component (with the highest eigenvalue) as presented in Table 6 were adopted as weights for the calculation of MDI.

Table 6. Principal components eigenvectors for managerial discretions index

Variable	Comp1	Comp2	Comp3	Comp4	Unexplained
CCAR	0.6692	0.2016	0.0195	-0.7150	0
TRCAR	0.6488	0.2441	-0.2689	0.6687	0
EBTL	0.3437	-0.6115	0.6926	0.1682	0
SIGN	-0.1145	0.7252	0.6690	0.1155	0

Source:authors' computation (2020) based on STATA 14 outputs.

4.4. Regression results

Regression analyses were performed to test the study's hypotheses. However, given the dual measure of use of LLPs as dependent variable, DLLP was derived from the estimation of equation (3) following the approach of Kanagaretnam et al. (2003). With derivation of DLLP, using both TLLP and DLLP as dependent variables was facilitated and relevant regression results are presented in Tables 8, 9, 10, 11 and 12 subsequent to the presentation of first stage regression in Table 7.

4.4.1. First stage regression

In deriving DLLP, previous studies (Kanagaretnam et al. 2003; Kwak et al. 2009; Shawtari et al. 2015) rely on Pooled OLS. However, following the approach of Chang et al. (2008) who apply an OLS with capacity to correct autocorrelated disturbances and Durbin-Watson problem, Prais-Winsten OLS was applied in this study. The problem of autocorrelated errors is present based on the results of Wooldridge panel data first-order autocorrelation test (W-AR(1)) with significant F-statistic of 30.87 at p-value<0.05. Thus, the appropriateness of Prais-OLS presented in Table 7.

Table 7. First stage regression of Kanagaretnam's et al. (2003) model

Variable	Dependent Variable: LLP			
	Coef.	**Std. Err.**	**t**	**P>t**
NPL_{t-1}	0.0868171*	0.0315985	2.75	0.007
CHNPL	0.0145134*	0.0026534	5.47	0.000
CHLOAN	0.0096714	0.0111539	0.87	0.387
cons	0.0192356*	0.0067048	2.87	0.005
R^2	0.1741			
Adj R^2	0.1591			
F-test	11.59(0.0000)*			
RMSE	0.05163			
W-AR(1)	30.87(0.0001)*			
Observation	169			
Model Type	Prais-OLS			

Source:authors' computation (2020) based on STATA 14 outputs.Wooldridge panel data first-order autocorrelation test: W-AR(1) and F-test reported F-statistics with p-value in parentheses. R^2 and Adj.R^2 stand for co-efficient of determination and its adjusted form respectively; RMSE stands for root mean squared error.*indicate significance at 99% confidence level.

Apart from low R^2 and its adjusted form (Adj_R^2), 17.41% and 15.91% respectively, the results presented in Table 7 are in line with previous studies. Other than insignificance of the coefficient of CHLOAN, the positive effect of the explanatory variables in the Kanagaretnam's et al. (2003) model presented in Table 7 is an indication that a higher level of beginning non-performing loans, change in non-performing loans and growth in total loans cause a higher level of LLPs. This is in agreementwith findings of Kanagaretnam's et al. (2003, 2004) and somehow with findings of Shawtari et al. (2015) except for a negative coefficient of CHLOAN. The residual terms of the model presented in Table 7 were used as abnormal LLPs

(DLLP). However, distinction that is required to be made between negative DLLP (income-increasing earnings smoothing) and positive DLLP (income-decreasing earnings smoothing) which is beyond the objective of this study necessitated the use of absolute value of DLLP (ADLLP) as dependent variable in the models where managerial use of DLLP was tested.

4.4.2. Hypotheses testing

Based on the study's econometric models, the first hypothesis which sought to test the managerial discretionary use of LLPs without any interaction was separately tested while the second, third and fourth hypotheses which required interactions of bank riskiness and IFRS adoption were jointly tested in a model. Given two dependent variables, TLLP and DLLP, four regression models are presented in Tables 8, 9, 10, 11 and 12. While Table 8 contains results of the test of overall use of LLPs for managerial discretionary decisions, others show the results of use of LLPs for each of the components of MDI.

From regression estimates, managerial discretionary decisions represented by MDI has negative impact on reported LLPs (TLLP) and abnormal LLPs (DLLP) though significant results are obtained in the TLLP model without interaction and ADLLP model with interaction. This indicates that managerial discretionary decisions of Nigerian DMBs were tailored towards reduction in TLLP within the sampled period. This reduction in TLLP might be aimed at increase in the level of profitability of these banks. However, reduction in DLLP engendered by MDI as evident in ADLLP model suggests the fact that increased profitability possibly emanating from reduction in TLLP was not out of maneuvering of earnings. This shows that increase in MDI is not a function of reduction in the financial reporting quality of Nigerian DMBs. This is also supported by significantly negative coefficients of IFRS in both TLLP and ADLLP models which symbolize that provisioning level (reported and discretionary) is at the low ebb during IFRS.

Table 8. Managerial discretions and LLPs

Variables	Dependent Variable: TLLP		Dependent Variable: ADLLP	
	Without Interaction	With Interaction	Without Interaction	With Interaction
MDI	-0.2174(-3.65)*	-0.0206(-1.55)	-0.0032(-1.33)	-0.0264(-4.17)*
IFRS		-0.0513(-3.33)*		-0.0306(-6.46)*
IFRS*MDI		0.0668(2.89)*		0.0582(3.34)*
SVR		-0.0068(-0.71)		0.0145(3.54)*
SVR*MDI		-0.0381(2.03)$^{\lambda}$		0.0128(1.66)$^{\varnothing}$
IFRS*SVR*MDI		-0.2896(-7.98)*		-0.0473(-2.37)$^{\lambda}$
ΔNPL	-0.0006(-0.08)	0.0036(1.87)$^{\varnothing}$		
LTA			0.0534(4.28)*	0.0473(2.13)$^{\lambda}$
LEV	-0.0012(-2.71)$^{\lambda}$	-0.0015(-3.53)*	-0.0001(-2.06)$^{\lambda}$	-0.0001(-0.59)
LgTA	-0.0664(-1.78)$^{\varnothing}$	0.0245(2.37)$^{\lambda}$	-0.0152(-6.67)*	-0.0057(-1.91)$^{\varnothing}$
LST	-0.0242(-0.96)	0.0092(0.73)	-0.0022(-0.80)	-0.0086(-2.30)$^{\lambda}$
_cons	1.4361(1.86)$^{\varnothing}$	-0.4550(-2.21)$^{\lambda}$	0.3223(6.66)*	0.1409(2.25)$^{\lambda}$
HUS	39.56(0.0000)*	19.98(0.0294)$^{\lambda}$	15.01(0.0103)$^{\lambda}$	52.43(0.0000)*
W-HET	6802.6(0.0000)*	24252.4(0.0000)*	26847.9(0.0000)*	10265.8(0.0000)*
W-AR(1)	0.133(0.7204)	19.192(0.0005)*	7.217(0.0169)$^{\lambda}$	6.864(0.0186)$^{\lambda}$
R^2	0.7145	0.8787	0.2051	0.3483
F-test/Wald	10.11(0.0002)*	508.71(0.0000)*	94.90(0.0000)*	332.82(0.0000)*
Observation	169	169	169	169
Model Type	Panel FE with	PW-PCSE	PW-PCSE	PW-PCSE

Source: authors' computation (2020) based on STATA 14 outputs. Regression coefficients are reported with z-statistics (for PW-PCSE) and t-statistics (for Panel FE) in brackets; Panel FE with RSE stands for panel fixed-effects model with robust standard errors while PW-PCSE represents Prais-Winsten Regression with correlated Panel Corrected Standard Errors. Hausman statistics (HUS), panel data Wooldridge test for heteroscedasticity (W-HET) and Wald Statistics (Wald) reported chi-square statistics with p-values in parentheses. Wooldridge panel data first-order autocorrelation test: W-AR(1) and F-test reported F-statistics with p-value in parenthesis.$^{\varnothing}$, $^{\lambda}$,and *indicate significance at 90%, 95% and 99% confidence levels respectively.

However, despite reduction in provisioning level during IFRS, Nigerian DMBs used their discretionary attributes embedded in MDI to increase both TLLP and DLLP during IFRS based on significantly positive coefficient of IFRS*MDI as evident in Table 8. This is an indication of the possibility of the use of LLPs to manage capital, smooth earnings and signal earnings during IFRS. What was typical of Nigerian DMBs threatened by solvency risk during the sampled period was reduction in TLLP and increase in DLLP given the negative (though insignificant) and positive coefficient of SVR in TLLP and ADLLP models respectively. The manipulative provisioning practices of the troubled Nigerian DMBs based on their riskiness was also evident with significantly negative and positive coefficient of

SVR*MDI in TLLP and ADLLP models respectively in Table 8. This suggests that reduction in TLLPs, which may lead toincreased profitability of troubled Nigerian DMBs, was a product of manipulative discretionary provisioning practices. However, during IFRS, improvement was noticeable as the reduction in their TLLP which may suggest an increase in profitability cannot be said to be facilitated by manipulative discretionary provisioning given significantly negative coefficient of IFRS*SVR*MDI in both TLLP and ADLLP models. An inference from the signs of coefficients of IFRS*MDI and IFRS*SVR*MDI is that improvement in the managerial discretionary use of LLPs during IFRS was only identifiable with sampled Nigerian DMBs threatened by risk of insolvency rather than all sampled DMBs.

From the control variables, the behaviour of growth in non-performing loans (ΔNPL) is dependent on the model as its coefficient is found to be negative in the TLLP model but positive in ADLLP model. However, increase in the proportion of total loans in total assets (LTA) is found to cause increase in DLLP based on the significantly negative coefficient of LTA in the ADLLP model. Also, higher ratio of total debts to equity (LEV) is found to cause reduction in both TLLP and DLLP while similar situation is noticeable with large banks based on significantly negative coefficient of LgTA except in the TLLP model including interaction terms. The listing status of DMBs outside Nigeria is also an instrument of reduction in provisioning level whether reported or discretionary as evident with negative coefficient of LST except in the TLLP model with interaction terms.

Based on the derivation of MDI, findings obtained from regression models presented in Table 8 are exclusive to this study and represent a contribution to LLPs literature. However, an increase in the discretionary use of LLPs for managerial decisions as identifiable with coefficient of IFRS*MDI is comparable to the findings of Attia et al. (2013), Ashraf et al. (2015), Ozili and Outa (2018), Ashraf et al. (2019) and Galdi et al. (2021). In contrast, a reduction in the managerial discretionary use of LLPs by Nigerian DMBs in solvency crisis during IFRS found in this study given the significantly negative coefficient of IFRS*SVR*MDI in relevant models can be compared to the findings of Leventis et al. (2011, 2012).

4.4.3. Further analysis

Although the influence of index of managerial discretionary decisions (MDI) on LLPs is the focus of this study, the continued test of use of LLPs for each of the components of MDI in the literature (Muriu, Josea 2020; Galdi et al. 2021; Le et al. 2021) necessitated separate test of the use of LLPs for earnings smoothing, capital management and earnings signalling in addition to MDI. The results of regression analyses are presented in Table 9 for earnings smoothing, Tables 10 and 11 for capital management and Table 12 for earnings signalling.

For use of LLPs to smooth earnings, Table 9 shows, on the whole, that Nigerian DMBs do not use LLPs to smoothing earnings based on significantly negative coefficient of EBTL except in the TLLP model without interaction terms.

Like in Table 8, the behaviour of dummy IFRS significantly negative coefficient in Table 9 indicates that provisioning level including discretionary provisioning was on downward trend during IFRS. However, during IFRS, Nigerian DMBs are found to use both TLLP and DLLP to smoothing earnings as the coefficient of IFRS*EBTL in both models in Table 9 is significantly positive. The results further show that Nigerian DMBs threatened by risk of insolvency recorded low TLLP but higher DLLP during the sampled period based on negative and positive coefficient of SVR in TLLP and ADLLP models respectively except that the coefficient is not significant in the ADLLP model. As further revealed, Nigerian DMBs in solvency crisis used TLLP rather than DLLP to smooth earnings during sampled period with significantly positive and insignificantly negative coefficient of SVR*EBTL.

The same practice was also observable in the provisioning practices of troubled Nigerian DMBs during IFRS given similar behaviour of IFRS*SVR*EBTL. This evidence of no improvement in the use of LLPs to smooth/manage earnings during IFRS found in this study is consistent with the findings of Eneje et al. (2016), Atoyebi and Simon (2018), Ozili and Outa (2018) and Galdi et al. (2021). However, this study's findings invalidate the conclusion of Ozili and Outa (2019) on reduction in the use of LLPs to smooth earnings subsequent to the adoption of IFRSs in Nigeria. The use of LLPs to smooth earnings by banks threatened by solvency risk as evident in the coefficient of SVR*EBTL in the TLLP model is a relative confirmation of previous findings of Alali and Jaggi (2011), Leventis et al. (2011)

and Ma and Song (2016). However, similar use of LLPs to smooth earnings which was found to be peculiar to troubled Nigerian DMBs during IFRS is contrary to the findings of Leventis et al. (2011).

Table 9. Earnings management (EBTL) and LLPs

Variables	Dependent Variable: TLLP		Dependent Variable: ADLLP	
	Without Interaction	With Interaction	Without Interaction	With Interaction
EBTL	1.890(4.65)*	-2.1793(-2.91)*	-0.5443(-2.25)$^{\lambda}$	-0.5956(-2.10)$^{\lambda}$
IFRS		-0.1477(-3.93)*		-0.039(-3.46)*
IFRS*EBTL		5.2368(5.74)*		1.0295(3.31)*
SVR		-0.1118(-3.43)*		0.0151(1.62)
SVR*EBTL		2.008(2.64)*		-0.0479(-0.13)
IFRS*SVR*EBTL		4.3805(5.16)*		-0.0832(-0.26)
ΔNPL	0.0016(0.53)	0.0082(2.14)$^{\lambda}$		
LTA			-0.0061(-0.19)	0.0014(0.05)
LEV	-0.0011(-1.62)	0.0005(1.74)$^{\theta}$	-0.0002(-1.21)	-0.00002(-0.1)
LgTA	-0.1562(-5.61)*	-0.0792(-6.15)*	-0.0092(-1.96)$^{\theta}$	-0.0041(-0.89)
LST	0.0515(2.43)$^{\lambda}$	0.0053(0.28)	0.0032914(0.62)	-0.0040(-0.71)
_cons	3.2621(5.76)*	1.7256(6.47)*	0.2347(2.29)$^{\lambda}$	0.1241(1.30)
HUS	0.87(0.9724)	15.25(0.0844)$^{\theta}$	0.90(0.9703)	5.43(0.8606)
LM	0.01(0.4664)	0.00(1.0000)	0.00(1.0000)	0.00(1.0000)
BPCW-H1	12.14(0.0005)*	50.13(0.0000)*	24.88(0.0000)*	38.19(0.0000)*
BPCW-H2	13.02(0.0232)$^{\lambda}$	51.39(0.0000)*	25.68(0.0001)*	40.35(0.0000)*
W-AR(1)	41.208(0.0000)*	30.833(0.0001)*	3.343(0.0875)$^{\theta}$	2.776(0.1164)
R^2	0.1626	0.4717	0.2122	0.2956
Adj_R^2			0.1881	0.2510
RMSE			0.03948	0.03792
F-test/Wald	46.50(0.0000)*	146.18(0.0000)*	8.78(0.0000)*	2.15(0.0239)$^{\lambda}$
Observation	169	169	169	169
Model Type	PW-PCSE	PW-PCSE	P_OLS with RSE	P_OLS with

Source:authors' computation (2020) based on STATA 14 outputs. Regression coefficients are reported with z-statistics (for PW-PCSE) and t-statistics (for P_OLS) in brackets; P_OLS with RSE stands for pooled ordinary least squared regression with robust standard errors while PW-PCSE represents Prais-Winsten Regression with correlated Panel Corrected Standard Errors.Breusch-Pagan / Cook-Weisberg test for heteroscedasticity with fitted values of dependent variable-TLLP/ADLLP (BPCW-H1) and independent variables (BPCW-H2), Random-Effects Breusch-Pagan Langrange Multiplier test (LM), Hausman statistics (HUS) and Wald Statistics (Wald) reported chi-square statistics with p-values in parentheses. Wooldridge panel data first-order autocorrelation test: W-AR(1) and F-test reported F-statistics with p-value in parenthesis.$^{\theta}$, $^{\lambda}$, and *indicate significance at 90%, 95% and 99% confidence levels respectively.

For the use of LLPs to manage capital, results are presented in Tables 10 and 11.As evident in Tables 10 and 11, negative coefficients of CCAR and TRCAR

except in the TLLP model with interaction terms revealed that Nigerian DMBs use TLLP and DLLP for management of bank core capital and total regulatory capital during the sampled period. This was also the case during IFRS but restricted to only reported LLPs (TLLP) since the coefficients of IFRS*CCAR and IFRS*TRCAR are significantly positive in the ADLLP models.

The increase in the provisioning level by Nigerian DMBs threatened by the risk of insolvency as evident in the significantly positive coefficient of SVR could not discourage the act of management of regulatory capital via LLPs in all models in Tables 10 and 11 except in the ADLLP model in Table 11 where TRCAR is dependent variable.This is an indication of management of capital via both TLLP and DLLP.

The scenario of management of capital through LLPs peculiar to Nigerian DMBs in solvency crisis does not know bounds as the reforms embedded in IFRS reporting could not lead to reversal in the negative coefficient of measure capital management given the significantly negative coefficients of IFRS*SVR*CCAR and IFRS*SVR*TRCAR. This is an indication that practice of capital management is well-pronounced among Nigerian banks and remains a central tool used in managerial discretionary decisions of loan loss reporting. The fact that adoption of IFRS was not found to improve the use of LLPs to manage capital is not a standalone finding having been in consistent with findings of Leventis et al. (2011) despite reporting lower coefficient of CCAR. The use of LLPs to manage capital was also reported by Ozili (2015) despite IFRS reporting. However, contrary evidence to the findings of the study were reported by Attia et al. (2013) and Atoyebi and Simon (2018).

For use of LLPs to signal financial strength, results are presented in Table 12.If the positive sign of coefficient of one-year-ahead changes in EBTL (SIGN) is considered as evident in Table 12, the case of the use of LLPs to signal financial strength by Nigerian DMBs can be established. However, considering insignificant positive coefficient of SIGN in TLLP and DLLP models with interaction terms as well as significantly negative coefficient of SIGN in TLLP model without interaction terms, no conclusive evidence could be inferred. Where conclusive evidence is palpable with significantly positive coefficient of SIGN, it was attained

via DLLP rather TLLP as evident in ADLLP model without interaction terms. Since DLLP is a product of managerial maneuverings, the decision of an investor with sufficient knowledge of activities of banks might be in contrary to the target of Nigerian DMBs which signal financial prospect. As equally obtainable in Tables 10 and 11, adoption of IFRSs in Nigeria based on coefficient of IFRS in Table 12 has led to the increase in reported LLPs (TLLP) but decrease in discretionary provisions (DLLP). Notwithstanding reduction in DLLP during IFRS, there was seemingly evidence of use of DLLP to signal based on insignificantly positive coefficient of IFRS*SIGN in ADLLP model. The provisioning level was found to be on high level for Nigerian DMBs threatened by risk of insolvency most especially in ADLLP model with SVR coefficient being significant at p-value<0.01. However, there was no any sign of use of LLPs to signal as coefficient of SVR*SIGN was found to be either significantly negative or insignificantly positive. The act of non-signal via LLPs by Nigerian DMBs threatened by risk of insolvency could not be reversed with reforms embedded in IFRS as coefficient of SIGN (IFRS*SVR*SIGN) was not only found to be negative, higher coefficient was also reported.

Evidence of no improvement in the use of LLPs to signal by Nigerian DMBs upon adoption of IFRSs found in this study is comparable to the findings of Attia et al. (2013) but contrary to the findings of Leventis et al. (2012) and Ozili (2015).

Table 10. Capital management (CCAR) and LLPs

Variables	Dependent Variable: TLLP		Dependent Variable: ADLLP	
	Without Interaction	With Interaction	Without Interaction	With Interaction
CCAR	-0.8830(-2.33)$^{\lambda}$	0.1442(2.38)$^{\lambda}$	-0.0354(-3.77)*	-0.0191(-0.90)
IFRS		0.1112(6.03)*		-0.0357(-5.27)*
IFRS*CCAR		-0.4872(-7.16)*		0.1587(7.27)*
SVR		0.0870(4.94)*		0.0359(6.92)*
SVR*CCAR		-0.1810(-2.40)$^{\lambda}$		-0.0466(-2.03)$^{\lambda}$
IFRS*SVR*CCAR		-0.8086(-8.81)*		-0.1177(-4.65)*
ΔNPL	0.0042(0.59)	0.0061(2.95)*		
LTA			0.0472(3.61)*	0.0421(3.11)*
LEV	0.0001(0.36)	-0.0018(-6.52)*	-0.0001(-2.22)$^{\lambda}$	-0.00003(-0.19)
LgTA	-0.0572(-1.14)	0.0117(1.77)$^{\theta}$	-0.0128(-5.52)*	-0.0005(-0.25)
LST	-0.0318(-1.12)	0.0076(0.64)	-0.0027(-0.99)	-0.0083(-4.13)*
cons	1.3676(1.25)	-0.2601(-1.94)$^{\theta}$	0.2802(5.84) *	.0190395(0.40)
HUS	49.55(0.0000)*	22.73(0.0118)$^{\lambda}$	8.38(0.1366)	11.56(0.3156)
W-HET	21175.9(0.0000)*	15381.8(0.0000)*		
LM			0.00(1.0000)	0.00(1.0000)
BPCW-H1			12.95(0.0003)*	32.35(0.0000)*
BPCW-H2			13.38(0.0200)$^{\lambda}$	35.78(0.0001)*
W-AR(1)	3.590(0.0776)$^{\theta}$	46.247(0.0000)*	9.149(0.0085)*	8.082(0.0123)$^{\lambda}$
R^2	0.6012	0.8790	0.2472	0.2106
F-test/Wald	6.47(0.0021)*	500.03(0.0000)*	141.93(0.0000)*	138.09(0.0000)*
Observation	169	169	169	169
Model Type	Panel FE with	PW-PCSE	PW-PCSE	PW-PCSE

Source:authors' computation (2020) based on STATA 14 outputs. Regression coefficients are reported with z-statistics (for PW-PCSE) and t-statistics (for Panel FE) in brackets; Panel FE with RSE stands for panel fixed-effects model with robust standard errors while PW-PCSE represents Prais-Winsten Regression with correlated Panel Corrected Standard Errors.Breusch-Pagan / Cook-Weisberg test for heteroscedasticity with fitted values of dependent variable-TLLP/ADLLP (BPCW-H1) and independent variables (BPCW-H2), Random-Effects Breusch-Pagan Langrange Multiplier test (LM),Hausman statistics (HUS), panel data Wooldridge test for heteroscedasticity (W-HET) and Wald Statistics (Wald) reported chi-square statistics with p-values in parentheses. Wooldridge panel data first-order autocorrelation test: W-AR(1) and F-test reported F-statistics with p-value in parenthesis.$^{\theta}$, $^{\lambda}$,and *indicate significance at 90%, 95% and 99% confidence levels respectively.

Table 11. Capital management (TRCAR) and LLPs

Variables	Dependent Variable: TLLP		Dependent Variable: ADLLP	
	Without Interaction	With Interaction	Without Interaction	With Interaction
TRCAR	-1.0104(-3.65)*	0.1337(2.28)$^{\lambda}$	-0.0267(-3.21)*	-0.0575(-2.17)$^{\lambda}$
IFRS		0.1223(7.93)*		-0.0471(-7.58)*
IFRS*TRCAR		-0.5372(-9.37)*		0.1925(9.48)*
SVR		0.1116(5.84)*		0.0323(4.14)*
SVR*TRCAR		-0.4052(-5.14)*		0.0198(0.62)
IFRS*SVR*TRCAR		-0.4860(-6.30)*		-0.1729(-5.33)*
ΔNPL	-0.0006(-0.08)	0.0037(1.73)$^{\varnothing}$		
LTA			0.0326(2.90)*	0.0623(2.81)*
LEV	-0.0012(-2.70)$^{\lambda}$	-0.0015(-3.57)*	-0.0001(-1.47)	-0.0001(-0.46)
LgTA	-0.0664(-1.78)$^{\varnothing}$	0.0175(2.20)$^{\lambda}$	-0.0122(-5.12)*	-0.0047(-1.96)$^{\lambda}$
LST	-0.0242(-0.96)	0.0104(0.80)	-0.0004(-0.17)	-0.0109(-3.28)*
_cons	1.6192(1.99)$^{\varnothing}$	-0.3767(-2.33)$^{\lambda}$	0.2709(5.39)*	0.1114(2.19)$^{\lambda}$
HUS	39.56(0.0000)*	27.44(0.0022)*	15.01(0.0103)$^{\lambda}$	21.72(0.0166)$^{\lambda}$
W-HET	6802.6(0.0000)*	9535.6(0.0000)*	26847.9(0.0000)*	10460.4(0.0000)*
W-AR(1)	0.133(0.7204)	28.303(0.0001)*	7.217(0.0169)$^{\lambda}$	5.923(0.0267)$^{\lambda}$
R^2	0.7145	0.8744	0.0980	0.3856
F-test/Wald	10.11(0.0002)*	540.23(0.0000)*	81.80(0.0000)*	978.92(0.0000)*
Observation	169	169	169	169
Model Type	Panel FE with RSE	PW-PCSE	PW-PCSE	PW-PCSE

Source:authors' computation (2020) based on STATA 14 outputs. Regression coefficients are reported with z-statistics (for PW-PCSE) and t-statistics (for Panel FE) in brackets; Panel FE with RSE stands for panel fixed-effects model with robust standard errors while PW-PCSE represents Prais-Winsten Regression with correlated Panel Corrected Standard Errors. Hausman statistics (HUS), panel data Wooldridge test for heteroscedasticity (W-HET) and Wald Statistics (Wald) reported chi-square statistics with p-values in parentheses. Wooldridge panel data first-order autocorrelation test: W-AR(1) and F-test reported F-statistics with p-value in parenthesis.$^{\varnothing}$, $^{\lambda}$,and *indicate significance at 90%, 95% and 99% confidence levels respectively.

5. Concluding remarks

Managerial discretionary use of LLPs by banks has become a critical subject in loan loss reporting. Overall with negative coefficient of MDI, it appears Nigerian banks are not guilty of the managerial discretionary use of LLPs. However, during IFRS when improvement or reduction in the act is expected the act becomes pronounced. . A similar situation exists regarding Nigerian DMBs threatened by risk of insolvency. Scenarios of all Nigerian DMBs in loan loss decisions during IFRS as

related to the use of managerial discretions (promoting manipulative loan loss provisioning practices) are comparable to the circumstance of all Nigerian troubled DMBs found culpable of use of DLLP for managerial discretionary decisions. Nevertheless, evidence of improvement in Nigerian DMBs' financial reporting quality embedded in the negative coefficient of IFRS could only be spotted in the discretionary use of LLPs for managerial discretions by Nigerian DMBs threatened by risk of insolvency during IFRS. This is an indication that adoption of IAS 39 for loan loss reporting improves the financial reporting quality of Nigerian DMBs threatened by solvency risk rather than less risky DMBs. The managerial discretionary use of LLPs evident in the Nigerian banking sector, despite reforms embedded in the adoption of IFRSs, is reinforced by the use of LLPs for capital and earnings management rather than earnings signalling.

The evidence of managerial discretionary use of LLPs found in this study gives credence to the recent regulatory decision for advancement in loan loss accounting in Nigeria. The advancement which came in the form of regulatory directives for banks in Nigeria to switch from IAS 39 to IFRS 9 was not done on full disclosure basis for the first four years of application starting from 1 January 2018. The discretionary tendencies inherent in IFRS 9 may serve as a setback given the level of discretionary use of LLPs by Nigerian DMBs in the IAS 39 regime. Therefore, higher level of surveillance and oversights is required for a compliance level not imbued with managerial maneuverings to be realistic. This will prevent similitude of managerial discretionary use of LLPs found for banks in OIC where national GAAPs were found to be superior to IFRSs (Ashraf et al. 2015) and evidence of no improvement in the use of LLPs for managerial discretionary decisions typical of Chinese banks subsequent to switch to Basel III (Chen et al. 2021). It will also prevent the South-African scenario with evidence that banks reporting in IFRSs are identifiable with smoothing of earnings via LLPs (Ozili, Outa 2018). The findings of this study also reinforce the need for review of Prudential Guidelines in Nigeria. Though done by CBN recently, the revised Prudential Guidelines are still in "exposure draft" (CBN 2019) two years after their publication. Better still, CBN can use the window for call for more reforms necessitated by findings of this study to have a second look at the guidelines to ensure rules that guarantee improvement in

managerial discretionary use of LLPs are incorporated into the relevant sections of the guidelines.

Table 12. Earnings signalling (SIGN) and LLPs

Variables	Dependent variable: TLLP		Dependent variable: ADLLP	
	Without Interaction	With Interaction	Without Interaction	With Interaction
SIGN	-2.7225(-5.91)*	0.7926(0.83)	0.1230(2.63)*	0.1086(0.79)
IFRS		0.1320(2.36)$^{\lambda}$		-0.0179(-3.17)*
IFRS*SIGN		-1.6645(-1.03)		0.2318(0.75)
SVR		0.0327(1.48)		0.0202(4.32)*
SVR*SIGN		-0.9161(-0.77)		0.0089(0.07)
IFRS*SVR*SIGN		-9.366(-3.19)*		-0.5619(-1.45)
ΔNPL	-0.0019(-0.42)	0.0183(2.47)$^{\lambda}$		
LTA			0.0510(3.76)*	0.0537(3.18)*
LEV	-0.0010(-1.45)	-0.0007(-0.87)	-0.0002(-2.51)$^{\lambda}$	-0.0001(-1.92)$^{\varnothing}$
LgTA	-0.1128(-3.97)*	-0.109(-2.63)*	-0.0171(-7.44)*	-0.0080(-3.43)*
LST	0.0344(1.78)$^{\varnothing}$	0.0432(1.74)$^{\varnothing}$	-0.0027(-0.92)	-0.0081(-2.40)$^{\lambda}$
_cons	2.4066(4.09)*	2.1998(2.62)*	0.3637(7.17)*	0.1750(3.50)*
HUS	4.40(0.4930)	10.01(0.4399)	4.34(0.5011)	6.13(0.8045)
LM	0.00(0.4781)	0.00(1.0000)	0.94(0.1667)	0.10(0.3743)
BPCW-H1	13.00(0.0003)*	41.05(0.0000)*	7.99(0.0047)*	15.28(0.0001)*
BPCW-H2	13.79(0.0170)$^{\lambda}$	42.19(0.0000)*	8.34(0.1382)	16.64(0.0828)
W-AR(1)	23.877(0.0002)$^{\lambda}$	5.509(0.0331)$^{\lambda}$	6.163(0.0254)$^{\lambda}$	5.913(0.0280)$^{\lambda}$
R^2	0.2719	0.6093	0.2414	0.2741
Wald	54.14(0.0000)*	43.40(0.0000)*	112.44(0.0000)*	125.84(0.0000)*
Observation	169	169	169	169
Model type	PW-PCSE	PW-PCSE	PW-PCSE	PW-PCSE

Source: authors' computation (2020) based on STATA 14 outputs. Regression coefficients are reported with z-statistics in brackets. PW-PCSE represents Prais-Winsten Regression with correlated Panel Corrected Standard Errors.Breusch-Pagan / Cook-Weisberg test for heteroscedasticity with fitted values of dependent variable-TLLP/ADLLP (BPCW-H1) and independent variables (BPCW-H2), Random-Effects Breusch-Pagan Langrange Multiplier test (LM), Hausman statistics (HUS) and Wald Statistics (Wald) reported chi-square statistics with p-values in parentheses. Wooldridge panel data first-order autocorrelation test: W-AR(1) reported F-statistics with p-value in parenthesis.$^{\varnothing}$, $^{\lambda}$,and *indicate significance at 90%, 95% and 99% confidence levels respectively.

Despite the contribution of this study to the literature in terms of construction of novel MDI, tests of use of both TLLP and DLLP for managerial discretionary decisions and joint test of moderating influence of IFRS and bank riskiness, supplementary robust findings are envisaged from future studies. These are achievable if comparison is made between discretionary use of LLPs during IAS 39 and IFRS 9 regimes though only feasible a couple of years or more after the

expiration of non-full disclosure regime of IFRS 9. Future Nigerian studies can also use datasets of other banks in addition to those of DMBs used in this study to complement the present evidence.

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Appendix
Measurement and definitions of components of MDI

S/N	Notation	Variable Name	Description	Sources
1	$CCAR_{it}$	Core capital	Ratio of core capital to total risk-weighted assets	Curcio and Hasan (2015)
2	$TRCAR_{it}$	Total regulatory capital	Ratio of sum of Tier 1 & Tier 2 capitals to total risk-weighted assets	Salami (2021)
3	$EBTL_{it}$	earnings before LLP and tax	Pre-LLP and Pre-tax earnings scaled by total assets	Leventis et al. (2011)
4	$SIGN_{it}$	one-year-ahead changes in earnings	(Pre-LLP and Pre-tax earnings of year t+1 less Pre-LLP and Pre-tax earnings of year t) scaled by total assets	Ozili (2015)

Source:author'scompilation (2020) based on deductions from related literature and conceptual framework.