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What explains provisioning behaviour in the banking industry? Evidence from an emerging economy

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Abstract

Existing literature shows that several factors drive loan loss provisioning among banks. However, there is a relative paucity of research regarding this topic in the African banking contextand specifically Kenya's banking industry. Using hand-collected annual bank-level data for the period 2000 to 2018, we investigate whether provisioning behaviour depends on banks' idiosyncratic or systematic factors. We also investigate whether provisioning is pro-or counter-cyclical through the business and credit cycles. We also seek to establish whether provisioning behaviour is heterogeneous for different bank groups. The estimation results reveals that banks use loan loss provisions for capital management,but which is more pronounced among small banks. We establish that provisions are used for capital management purposes but the findings are sensitive to bank size and ownership status. We also find evidence in support of the earnings management hypothesis, which is also sensitive to bank size. Further, the evidence suggests that provisions reflect changes in the quality of the banks' loan portfolio and are counter-cyclical to the business cycle.

***Keywords**:* Capital Management, Loan Provisioning, Income-Smoothing, Procyclicality, Signaling.

JEL Classification: G21; G28; M41.

1. Introduction

Through intermediation, banks mobilize savings and channel funds to finance consumption and investment. In the process of liquidity and maturity transformation, they bear the burden of credit risk, which is mitigated by setting aside provisions. Whereas provision ensure stability, on the downside, it erodes capital and earnings (Quagliariello, 2007). Moreover, its discretionary use; to smooth incomes, to signal future performance prospects, for capital management and for taxes purposes (Ozili& Outa, 2017) is inconsistent with the role of mitigating credit impairment.

Loan loss provisions (LLPs) are either forward-looking if based on expected losses or backward-looking if based on incurred losses. Forward-looking provisions are counter-cyclical, acting as buffers during downturns, thus minimizing its use for discretionary purposes such as income smoothing (Leventis, Dimitropoulos, &Anandarajan 2011). Despite the Basel Committee advocating for the adoption of the forward-looking framework, several countries including Kenya, still use the backwards-looking framework hence underestimating loan losses during economic expansions[1]. As a result, this exacerbates bank lending procyclicality with potential adverse macroeconomic effects[2](Berger & Udell, 2004) as provisions during a downturn are usually very thin and hardly sufficient to cover for credit impairments (Bushman and Williams, 2012).

Buttressed by the destabilizing effects of the 2007-2009 global financial crises, the adoption of a forward-looking provisioning framework is vital given that the backward-looking framework adopted by financial institutions meant that the provisions were insufficient. During this period, many banks increased their LLPs, significantly depleting their capital which necessitated financial bailouts[3] for institutions in breach of the minimum capital requirements. Perhaps this explains regulators emphasis on the adoption of counter-cyclical macro-prudential policies (Boar *et al.,* 2017) to cool the economy during a boom and to stimulate it during a downturn without substantially affecting liquidity and maturity transformation (Drehmann*et al.,* 2011).

Being a significant accrual item, LLPs are used for different reasons among them income smoothing (Laeven and Majnoni 2003; Leventis et al., 2011), signalling (Liu *et al.,* 1997; Kanagaretnam*et al.,* 2005), capital management (Ahmed et al., 1999; Kilic et al., 2012; Guidara et al. 2013), risk-management (Foos*et al.,* 2010; Amador et al., 2013) and for tax purposes. As such, given the informativeness of LLPs in accounting disclosures, they are often linked to regulatory authorities' micro-prudential surveillance policies given its direct impact on bank interest margin and consequently earnings.

Provisioning across banks is not uniform. Existing literature suggests that the heterogeneity arises from differences in market structure, bank characteristics and the operating environment. Large banks are more diversified and in a better position to withstand shocks as diversification reduces the exposure to risk (Huizinga & Laeven, 2019). Therefore LLPs are more likely to be higher in large bank's due to the scale of the intermediation (Anandarajan, Hasan &Lozano-Vivas, 2003). Also, large banks are more sensitive to general market movements than small banks with a more in-depth understanding of their clientele and hence able to overcome problems of adverse selection (Domikowsky et al., 2014). Hence, bank size is expected to positively influence LLPs. Bank ownership, domestic or foreign-owned influences LLPs differently. Domestic-owned banks, for instance, have incentives to use LLPs for signalling and income-smoothing more than foreign-owned banks because they are under immense scrutiny from the shareholders and thus pressured to report increased returns. Similarly, recognition of losses and incomes among domestic-oriented banks

[1] Different reasons in the extant literature has been put forth but important among them are; (i) disaster myopia (Guttentag*et al.,* 1986), (ii) herding behaviour (Rajan, 1994) and, (iii) signalling the quality of a bank's portfolio (Ahmed *et al.,* 1999).

[2]During economic expansion, banks to underestimate their exposures to credit risk as screening and monitoring is relaxed leading to lower provisioning.

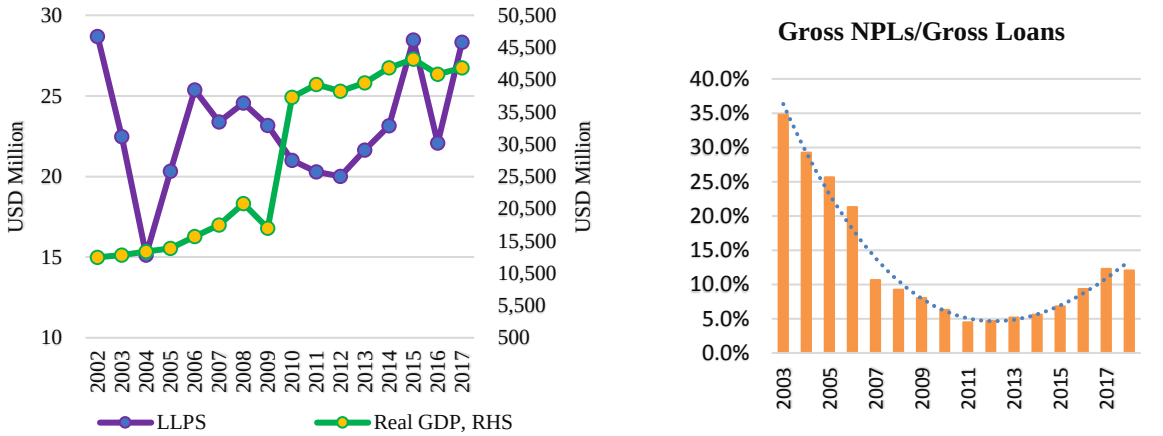
[3] While examining provisioning policies during the 2007–2009 financial crisis, Curcio and Hasan (2015) found a change in banks' behaviour where LLPs are not used to smooth bank income but rather become pro-cyclical.

probably tend to be asymmetric and conservative; thus, LLPs tend to be procyclical (Nichols, Wahlen, & Wieland, 2009). Further, the role of bank-structure, whether a bank is pan-African, has not been formally tested so far yet the business model may influence its response to macroeconomic conditions differently compared non-pan-African banks.

Two studies closely related to this paper are by Murcia and Kohlscheen (2016) and Hessou, et al (2019) who examine loan loss provisioning among banks in emerging market economies and microfinance banks worldwide respectively. Using a sample of 554 banks from emerging economies, Murcia and Kohlscheen (2016) found that provisions are procyclical. Hessou, et al (2019) also established that provisions are negatively associated with the business cycles among microfinance institutions therefore procyclical. We extend this strand of literature several ways. First, unlike these studies, using a country-specific investigation, we explicitly model how differences in market structure, bank characteristics and ownership structure affect LLPs. We extend the foreign and domestic-oriented bank dichotomy of LLPs by examining the differences between pan-African and non-Pan-African banks. Thus, the empirical strategy exploits the heterogeneity in LLPs arising from the divergent operations and structure in the Kenyan banking industry.

Several reasons justify the relevance of this study on the Kenyan banking sector. First, the examination of provisioning is critical for monitoring the health of a financial system not ony because it represents the most significant accounting expense but also because it erodes both the bank's ability to lend, reduces capital and profitability. More importantly and from a regulatory perspective, provisioning requires close monitoring to ensure adequacy which guarantees a stable and sound financial system. Second, the banking system's LLPs are cyclical to the business cycles (**Figure 1**), which is undesirable from a financial stability perspective[4]. The period 2013-2018 is characterized by a persistent rise in NPLs, thus amplifying the need for more LLPs.

Figure 1: Loan Loss Provisioning, Asset Quality and Business Cycles



Panel A: LLPs& Real GDP Prices **Panel B: Kenya's Asset Quality Evolution**

Third, being a bank-oriented economy (Mwega, 2014), any disruption to the banking system is associated with severe macroeconomic effects. Given its critical role for East and Central Africa cross-border banking its stability is paramount to mitigate against possible contagion and domino effects to other countries.

This paper, therefore, attempts to understand three fundamental questions on LLPs in the Kenyan banking industry; (i) even though banks are subject to the same prudential guidelines, accounting standards and aggregate risk, what explains the difference in LLPs? Is LLPs sensitive to different

[4]This implies that bank capitalizations are more negatively affected at the trough of the business cycle and consequently banks' supply of credit to the economy thus amplifying the procyclicality of loan loss provisions (Bernanke &Lown, 1991).

banks idiosyncratic factors in addition to systematic factors? This question highlights an influential but relatively under-examined research agenda in an emerging market context. While relying on theories of banking structure and risk-taking, this paper seeks to achieve three objectives. First, we investigate whether provisioning behaviour depends on banks idiosyncratic and systematic factors. Second, we investigate whether provisioning is pro-or counter-cyclical through the business and credit cycles. Third, we investigate whether provisioning behaviour is sensitive to bank type given that existing literature shows that LLPs are heterogeneous among banks.

Using a sample of 38 banks for the period 2000–2018 and applying the generalized methods of moments (GMM) estimator by Blundell and Bond (1998), our results show that; (i) banks use provisions for capital management purposes but which is sensitive to bank size and ownership status. (ii) earnings management is an essential factor affecting provisioning decisions among Kenyan banks but which is also sensitive to bank size; (iii) LLPs reflect changes in the quality of the banks' loan portfolio; (iv) Provision among banks are counter-cyclical.

This study contributes to a growing literature on financial stability three-fold; using a dynamic panel data framework to examine provisioning behaviour we document bank-level and macroeconomic drivers of LLPs while exploring heterogeneity in Kenya's banking system which is critical in the formulation of financial policies that ensures a sound and resilient financial system. Second, the study's inference informs financial reporting policies, especially during the transition period to the expected loss model under IFRS 9. More importantly, our results have important policy implications for the supervision of Kenyan banks going forward. First, considerable heterogeneity in the discretionary use of provisions by bank managers in the application of the incurred loss model of IAS 39 implies that even post-transition to the expected credit loss model of provisioning as envisaged by IFRS 9, a significant deal of discretionary use of LLPs exist and calls for considerable efforts to ensure uniformity in the application of the provisioning frameworks. Lastly, we contribute to the policy debate on the design of macro-prudential regulation, especially counter-cyclical provisioning policies to alleviate the risks of amplified macroeconomic imbalances arising from bank lending practices along the business cycle.

The remainder of this paper is structured as follows. The next section presents the stylized facts/institutional context. A brief review of the literature and hypothesis development is presented in section 3. In section 4, we present and discuss methodology and the data employed. The estimation and discussion of the results are presented in section 5, while the final section concludes.

2. Stylized Facts

2.1 The Banking Industry in Kenya

Kenya's banking system is aptly described as being resilient and transformative and comprises of 43 institutions[5]; 42 licenced commercial banks, one mortgage refinance company, nine representative offices of foreign banks and 13 Microfinance Banks (*see Table 1 in the appendix of ownership structure details*). Between the year 2000 and 2017, banking system deposits to gross domestic product (GDP) has grown to stand at 31.41 percent in 2017. Asset quality, albeit small, has been growing. Bankdomestic credit to the private sector as a percentage of GDP averaged 27.90 percent over the same period. With a total asset base of USD 36.5 million, it contributes 7 percent of the gross domestic product (GDP) and hence the most extensive banking system within the East African region.

A look at the banking system in Kenya would not be complete without looking at the trends in profitability. The sector's rate of growth of profit has been on a decline attributed to a confluence of both the rise in non-performing assets and market shocks. However, while capital remains adequate,

[5]Charter House is under statutory management. Imperial Bank and Chase Bank are under receivership while Fidelity Commercial bank is under acquisition.

the high and persistent NPLs it not only feeding into the industry's risk-taking behaviourbut leading to higher high provisioning and thus depressed earnings.

Other transformative developments have occurred in the last ten years. Noticeably among them has been the transformations ofnon-bank financial institutions (NBFI's) to banks. The industry has also witnessed an introduction of new products and the extension of banking hours. More importantly, nine banks are engaged in cross-banking in seven jurisdictions (CBK, 2016). The industry has also adopted borderless banking where customers having accounts in a bank in one country can transact in other countries in the subsidiary bank (see appendix for Kenyan banks operating in East and Central Africa).Cross-listing of bank shares is also evident in East Africa[6].

Among other policy developments within the sector include agency banking introduced in 2011 and has fundamentally changed the way banks operate and their appetite towards risk. On the regulatory front, the banking industry has experienced numerous changes in its capital adequacy requirements. For instance, in 2013, the ratio of core capital to total assets stood at 8% while that of total capital to total risk-weighted assets was 12%. In 2016, the minimum capital requirements increased by approximately 5% with the ratio of core capital to total assets and the ratio of total capital to total risk-weighted assets standing at 10.5 % and 14.5% respectively (CBK, 2013 & 2016).

2.2 Institutional and Regulatory Monitoring of Loan Loss Provisioning

Before the adoption of expected loss model for credit impairment, as required under the International Financial Reporting Standard (IFRS) 9, banks in Kenya adopted the incurred loss model under the International Accounting Standard (IAS) 39. This framework is operationalized by the Central Bank of Kenya's Prudential Guidelines that derives it prerogative under Section 20 of the Banking Act mandating institutions to regularly monitor its assets portfolio and ensure provisions for impaired credit is adequate[7]. Under this framework, a bank's provisions can take two forms: specific or general provision. A specific provision is set aside for a loss that has already materialized, however, if the loss is latent and cannot yet be ascribed to any individual loan a bank can set aside a general provision.

As part of monitoring its asset portfolio, the guideline mandates the board of directors of financial institutions to develop an asset review system for the identification of risk, establishment of credit policies and ensuring that expected losses are adequately provisioned. Whereas institutional policies guiding credit and losses developed by the board are based on internal risk rating systems, the guidelines require that be aligned with the Prudential Guidelines. As such, based on the borrower's repayment capacity loans are classified under five categories for provisioning purposes: normal, watch, sub-standard, doubtful and loss[8].

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[6]For example, Equity Bank which is also listed at Uganda Securities Exchange (USE), Kenya Commercial Bank (KCB) is also listed at the Uganda Stock Exchange, Rwanda Stock Exchange (RSE) and Dar es Salaam Stock Exchange (DSE).

[7] Under the guidelines, classification of credit impairment is assessed based on the borrower’s repayment capacity and is treated as impaired if either the principal or interest is unpaid after 90 days of more or when the interest payments that has been due for 90 days or more is refinanced or rolled over into a new loan.

[8] Normal Loans are loans exhibiting no signs of stress and that the laid down contractual plans (i.e. repayments) are still maintained. Watchful loans are loans that exhibit signs of distress and if not addressed they have the potential to weaken an institutions asset quality at some future date. Among the metrics pointing to a loan considered as watchful is its deteriorating condition or control of collateral, weakening economic conditions, and a deterioration of the borrower’s financial position. Loans that fall under the sub-standard category are those whose primary sources of repayment are insufficient to fully service the principal and interest payments and therefore an institution must consider secondary sources for repayment. Doubtful loans are those that have exhibited inherent weaknesses under the substandard category and that the loan is not well secured. The last category is a loss where the loan is uncollectible or its continued recognition as a bankable asset is minimal. A loan that falls under the sub-standard and doubtful categories are considered non-performing loans. Once an asset is classified as a loss at the mutual agreement of the parties (the bank and the borrower) it can be renegotiated and reclassified under the normal or watchful category.

Under these different categories, different rules apply. For instance, provisions for loans falling under normal category is set at 1% of the portfolio, watchful loans at 3%, substandard loans at 20% while loans under the doubtful and loss category require full provisioning (i.e. 100%). However, if reliable information exists, then higher provisions are set aside based on the information set available. More importantly, the minimum provisions are guided by multiple factors among them an institution's historical loan loss experience, prevailing economic conditions, non-performing asset trends, the effectiveness of the institution's lending and remedial policies among others.

Despite the loan classification for provisioning purposes being aligned with the prudential guidelines, the Central Bank also plays an oversight role through on-site inspections. Furthermore, in instances where the bank's classification and the classification of the Central Bank based on on-site inspections are divergent, tripartite meetings are held between the bank, CBK and the external auditors to harmonize the mismatch and consequently allow banks to reclassify its accounts appropriately. To ensure compliance with the guidelines, institutions submit detailed monthly returns of the provisions to the Central Bank.

2.3 Basel Regulations in Kenya

The Basel I standards, first introduced in 1998, focused on capital adequacy and credit risk and required banks to maintain a minimum capital risk-weighted capital adequacy ratio of 8%. While its compliance was set to 1992, in Kenya its adoption was staggered by two years with the implantation year being 1994 through the amendment of sector four of the Banking Amendment Act of 1989[9]. Further, a wave of bank failures in 1998triggered an increase in the minimum capital risk-weightedto USD 2.7 millionwith compliance of the requirement set by December 1999[10]. In October 2000, the minimum capital was increased further to USD 3.2 million. Banks were therefore expected to maintain a minimum core capital to total risk-weighted assets ratio of 8 percent as well as that of core capital to total deposits ratio. The minimum ratio of total capital to total risk-weighted assets was set at 12%.

In 2004, Basel II was introduced; however, its adoption, especially among emerging and frontier economies, was selective (Beck, Jones & Knaack, 2019). The non-adoption of the Basel II standards anchored on the fact that it was a non-priority for non-members (Mwega, 2014). Even despite the selective adoption, in 2006, prudential guidelines were amended[11] to strengthen Kenya's regulations in its readiness for the adoption of Basel II standards (Upadhyaya, 2017). In 2007, a supervisory infrastructure roadmap for the adoption of Basel II[12] was issued by the Central Bank of Kenya.

In the wake of the global financial crisis of 2008, new requirements for core capital were imposed. The adoption of the amendments was to be progressively adjusted. By 2009, banks were required to have a minimum capital of USD 1.3 million, a minimum capital of USD 1.9 million by 2010[13], USD 2.3 million by December 2011 and USD 3.0 million by 2012[14].The Banking Act amended in 2012

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[9] Among the amendments to Section 7 of the Banking Act 1989 (Cap 488) included the harmonization of the accounting financial year, approval of the bank auditors by the Central Bank of Kenya and the reduction of the extent of exposure of a single borrower limit to core capital from 100% to 25%.

10 The conversion to dollar equivalent is based on the prevailing exchange rate of 1 USD = KES. 72.931 in 1999 and 1 USD = KSH. 78.036 in 2000.

[11] Among the changes introduced in the guidelines were differences between core capital (tier 1), and supplementary capital; defining four risk weights for classifying balance sheet assets; and conversion factors for interest rate and exchange rate contracts based on residual maturity periods.

[12] Among these preparations were (i) the full adoption of Basel I in particular the risk amendment that requires banks to set capital for market risk in addition to credit risk; implementation of risk-based supervision; full compliance with the Basel Core principles for effective banking supervision through comprehensive review of the banking act that is under consideration by the attorney general.

[13] Several other changes were introduced. In 2010, the Banking Act Section 33A and 34 were amended to include measures to be taken to counter bank undercapitalization.

[14] The The conversion to dollar equivalent is based on the prevailing exchange rate of 1 USD = KES. 77.4 in 2009KES. 79.2 in 2010, KES. 88.8 in 2011, andKES.84.5 in 2012.

introduced a provision allowing for the prescription of the minimum capital adequacy ratios and aligned the bank's financial reporting to the international financial reporting standards (IFRS)

The prudential guidelines were further amended in 2013[15], and the new guidelines contained a combination of both Basel II and Basel II capital adequacy standards[16]. In 2013, the Banking Act was amended to ensure the independence of the CBK, thus strengthening her supervisory framework by allowing her to develop and implement additional regulations. Further, risk management guidelines were introduced in 2013 but are yet to consider the adoption of counter-cyclical macro-prudential regulations.

With Basel I and II standards not fully implemented, the Basel III standards on contingency capital ratios, net stable funding ratio (NSFR) and guidelines on systemically important banks (SIB) are yet to be adopted. Even so, Kenyan banks adopted a capital conservation buffer of 2.5 percent. Institutions meeting the minimum capital adequacy ratios but with low conservation buffers needed to put in place prudent retention policies on earnings with a view of the minimum conservation buffers ratios by 2016.

3. Literature Review and Hypothesis Development

3.1 Earnings Management and Loss Loan Provisions

The first strand is related to the literature that examines the association between loan loss provisions and earnings management. This strand is commonly referred to as the income-smoothing hypothesis. The nexus between the use of loan loss provisions for earnings management arise because regulators monitor banks on based on earnings and given that it is an item in the income statement bank managers have an incentive to manage it. Whereas a bank's taxable income can be increased by raising interest incomesfrom trading of securities and foreign exchange trading, among others, it is often difficult to manipulate. On the other hand, incomes can be reduced by interest expenses, operating costs and loan loss provisions the former can be varied as it is a matter of judgement based on loan classification as discussed in section 2.2[17].

The theoretical framework underpinning the use of LLPs for income smoothing is limited. Nonetheless, we infer from the extensive literature that suggests that bank managers smooth incomes in an attempt to reduce perceived risk as income volatility is a key risk indicator that attracts considerable investor attention (Beaver, Kettler, and Scholes 1970). The market microstructure theory, also, provides an alternative explanation for income smoothing. Moreover, according to the microstructure theory,income volatility amplifies information asymmetry between the managers and investors as well as between market makers and privately informed investor. To mitigate against the asymmetry, the bid-ask spread by market markers edges up, especially when incomes are volatile (Affleck-Graves, Callahan, and Chipalkatti 2002) and because of adverse selection the cost of capital increases. Aware of this, bank managers smooth incomes to ensure predictability of earnings.

[15] In 2013, Section 55 of the Banking Act was further amended, allowing for penalties to be levied on non-compliance with the prudential guidelines.

[16] For instance, (1) it required a standardized approach in the treatment of government securities as non-risky even when not AAA rated; (2) it required that the operational risk-weighted assets equivalent is calculated as 15 percent of three years average gross incomes multiplied by a factor of 1.25 (being the inverse of 8 percent) and was to be effective January 1, 2014; (3) it also called for a standardized approach in the treatment of both interest rate and foreign exchange risk while requiring banks to undertake quarterly stress testing in accordance with the Internal Capital Adequacy Assessment Process (ICAAP) reporting. Even such, the implementation of ICAAP reporting became enforced in 2017; (3) on market discipline, it required banks to publicly disclose its financial statements.

[17]Adjustment of the loan loss provisions upwards decreases the taxable income by increasing the expenses. Thus, by exercising its discretion on the magnitude and timing of loan loss provisions bank managers can use it to smooth incomes.

Extensive literature supports the view that bank managers use LLPs for income smoothing purposes. (Laeven and Majnoni 2003; Leventis et al., 2011; El Sood, 2012; Curcio and Hasan, 2015; Skala, 2015).In this case, when the bank's actual losses exceed the expected, they draw down on loan loss reserves when the actual losses hence reducing the volatility of incomes. Zoubi and Al-Khazali (2007) find that under different regulatory regimes and accounting frameworks bank in the Gulf Cooperation Council banks smooth LLPs. In the Netherlands, Norden and Stoian (2013) also provide evidence suggesting the LLPs are used to smooth income, and more importantly banks increase it when income is high and scale down when regulatory capital is low.

In the US, El Sood (2012) established that between 2001 and 2009, banks used LLPs to smooth income after fulfilling the minimum regulatory capital requirements, especially during non-recessionary periods. In the Asian economies, Packer et al. (2014) also found evidence of income smoothing. Similar finds have been established by Dadoukis, Hall Nguyen and Simper (2015) in Vietnam. In contrast, in Italy for the period, 2001-2015 Caporaleetal. (2013) finds no evidence of income smoothing. We thus hypothesize that a bank's incomes affect loan loss provisioning behaviour. That is higher bank earnings are likely to be associated with higher LLPs,and lower earnings among banks tend to be associated with lower LLPs.

3.2 Capital Management and Loss Loan Provisions

The second strand of literature thus relates to the use of LLPs for capital management purposes. The current Basel Bank Capital Accord (Basel III) regulation requires banks to increase capital adequacy ratio to contain their risk-taking behaviour by providing a buffer against expected and unexpected losses while allowing banks to lend. Increased adequacy ratios thus ensuring a stable and resilient banking system. According to this strand of literature, LLPs are linked to capital management given that managers can use it to achieve minimum regulatory capital requirements and thus avoid the cost of non-compliance[18]. As such provisions tend to be higher when a bank's capital is low. Thus, LLPs and capital are considered substitutes for potential losses (Bikker&Metzemakers, 2005). In line with the pecking order theory raising additional capital is difficult; thus, bank managers have an incentive to manipulate LLPs to achieve desired levels of capital that supports temporary future shocks.

Existing empirical studies tend to support the view that LLPs are increased when equity capital is inadequate (Kilic et al., 2012) or to meet minimum regulatory capital requirements (Ahmed et al., 1999). Competing studies have arrived at dichotomous conclusions.Although some studies have established a positive relationship between capital and risk (see for example Lee and Hsieh 2013)), others have documented a negative relationship where banks tend to increase their risk positions as capital declines and vice versa (Guidara et al. 2013). We thus hypothesize that a bank's level of capital affects loan loss provisioning behaviour. In particular, the low capital position of a bank is likely to be associated with higher LLPs,and higher capital base is likely to be associated with lower LLPs.

3.3 Cyclicality of Loan Loss Provisions

The third strand of literature is related to the pro-or counter-cyclical nature of LLPs. That is, if LLPs are procyclical bank capital are negatively affected during periods of economic contraction, which is the period during which conditions in the capital market are weak. Similarly, if LLPs are counter-cyclical, this implies that LLPs are higher during periods of economic boom and thus act as a cushion during periods of economic contraction. Procyclicality of bank's LLPs is undesirable as it is a

[18]Since Central banks require banks to maintain a certain minimum capital as a cushion against individual risk-taking decisions of banks on lending, bank managers, therefore, have the incentive to influence its level (Ahmed et al., 1990; Moyer, 1990).

harbinger for an unstable financial system. Besides, higher LLPs is associated with cyclicality and constrained bank lending arising from the cyclicality of bank capital.

Under Basel II, a bank's capital should be set commensurate to its client's probability of default;thus, capital requirements and output growth move in opposite directions (Ayuso et al., 2004). LLPs are procyclical if it is negatively associated with economic growth. Support of this view suggests that an economic boom leads to an upswing in the credit given that quality of risk assessments by banks is relaxed, which may amplify credit risk. Conversely, during economic contractions, bank lending standards tend to be relaxed, yet if during periods of expansion provisions are under-provisioned,leading to a further reduction in lending and thus exacerbating economic downturns.

Ozili and Outa (2017) provide an excellent survey of the literature on pro-or counter-cyclical of loan provisioning and concludes that the evidence remains mixed. An extensive literature has provided convincing evidence to support a negative relationship between economic activity and loan loss provisions (see for instanceBorio et al., 2001; Bikker and Hu 2002; Cavallo and Majnoni 2002; Laeven and Majnoni 2003). On the contrary, Bikker and Metztemakers (2005), Bouvatier and Lepetit (2012), Frait and Komarkova (2013) establish a positive relationship. Murcia and Kohlscheen (2016) using a sample of 554 banks from emerging market economies, established that provisions are also procyclical. In the microfinance literature, Hessou,Lensink,Soumaré, and Tchuigoua(2019) examined the drivers of provisioning behaviour among 1474 microfinance worldwide for the period 2001 to 2014 and established that provisions are negatively associated with the business cycles thus offering support to the observation that provisions are procyclical.We thus hypothesize that the economic cycle affects a bank's loan loss provisioning behaviour.

3.4 Risk-taking and Loan Loss Provisions

The fourth strand of the literature evaluates how a bank's financial performance is affected by its risk-taking decisions; however, the empirical evidence remains inconclusive. On the one hand, credit growth does not necessarily lead to higher non-performing loans in the future, especially if the credit extended is to solvent firms with viable projects with a positive net present value. However, if during periods of economic expansion, banks relax their lending standards such otherwise insolvent firms receive credit, this would trigger higher defaults in its portfolio when the economic cycle is in a trough. In this respect, understanding the nexus between a bank's risk-taking and loan loss provisions remains critical.

Among Colombian Banks, Amador et al. (2013) established that highercredit growth is positively associated with rising non-performing loans and negatively related to bank solvency. Among a sample of developed economies,Foos*et al.*(2010) find that loan growth leads, in the following three years, to an increase in loan loss provisions, to a decrease in relative interest income, and to lower capital ratios. Another emerging theme in the LLP literature is the conflict between prudential regulatory objectives and accounting standard-setting objectives (Gaston & Song, 2014). Post the 2008 financial crisis bank regulators globally required banks to adopt counter-cyclical loan loss provisions approach as buffers against loan losses that materialize during bad times (Adrian & Shin, 2010).

3.5 Signaling and Loss Loan Provisions

The fifth strand of literature test the signalling hypothesis. According to this strand, managers use LLPs to signal the bank's future growth trajectory to outsides. Therefore,bank managers may report higher LLPs when they anticipate high future earnings or high non-performing loans (Liu *et al.*, 1997; Kanagaretnam*et al.*(2005).Anchored on the signalling theory, the hypothesis that LLPs are used to signal is motivated by the need to address adverse selection problems and cost related to a signal's credibility. That is, to be credible, the cost of a wrong signal must be sufficiently higher if a bank's prospects are low,which is the case if current bank earnings are low. Thus, higher LLPs signal a bank's lower future earnings.

4. Data and Methodology

4.1. Model Specification

We assume that banks set their LLPs target *apriori* and gradually adjust towards it based on the previous period realized loan loss. Thus, following the approach of Packer and Zhu (2012); Murcia and Kohlscheen (2016) and Dushku (2016) we assume that a bank's provisioning behaviour of banks follows a dynamic adjustment framework of the form;

$$\Delta LLP_{i,t} = \lambda\left(LLP^*_{i,t} - LLP_{i,t-1}\right) + \eta_{i,t} \quad (1)$$

Where i and t indexes banks and time (year) respectively. From equation (1), during period t a bank adjusts its loan loss provisions by λ of the target LLPs ($LLP^*_{i,t}$) and the previous period$\left(LLP_{i,t-1}\right)$. The inclusion of $LLP_{i,t-1}$capture the adjustment costs towards the target $LLP^*_{i,t}$. In adjusting to the$LLP^*_{i,t}$, we assume that $LLP^*_{i,t}$, is a function of bank's idiosyncratic characteristics and the business cycles. We, therefore, adopt the following specification.

$$LLP_{i,t} = \alpha_0 + \alpha_1 LLP_{i,t-1} + \alpha_2 CAP_{i,t} + \alpha_3 Sign_{i,t} + \alpha_3 EBTP_{i,t} + \alpha_4 Size_{i,t} + \alpha_5 LIQ_{i,t} + \alpha_6 LG_{i,t} + \alpha_7 AQ_{i,t} + \alpha_8 GR\_AQ_{i,t} + \alpha_9 rGDP_t + \alpha_{10} Ownership_{i,t} + \varepsilon_{i,t} (2)$$

$LLP_{i,t}$are loan loss provisions at time t, $LLP_{i,t-1}$ is a one-period lag of $LLP_{i,t}$. $CAP_{i,t}$is capital to risk-weighted asset ratio and tests the capital management hypothesis. $EBTP_{i,t}$represents earnings before interest, taxes and tests for the income smoothing hypothesis.$Sign_{i,t}$ is the one-year ahead percentage change in $EBTP_{i,t}$. $Size_{i,t}$ captures the size of the bank, $LIQ_{i,t}$ is a measure of bank liquidity, $LG_{i,t}$is a loan growth measure. $AQ_{i,t}$ is an asset quality measure and $GR\_AQ_{i,t}$ represent the percentage change in asset quality. $rGDP$ is real GDP growth, $Ownership_i$is a measure of a bank's ownership[19].The explanatory variables chosen are established in the literature.

4.2. Definition, Measurement of Variables and Data Sources

Loan loss provisionis measured as the ratio of loan loss provisions to lagged total assets. The lagged loan loss provisionover lagged total assets is an autoregressive term capturing the adjustment costs[20].*Ownership*captures a bank's ownership structure which is measured in percentage terms (i.e. the proportion of foreign shareholding to the total shares of the bank). $EBTP_{i,t}$is the ratio of earnings before interest, taxes and loan loss provision to total assets. It is used to test the income smoothing hypothesis. If the $\alpha_3$coefficient is positive;this supports the hypothesis that LLPs are used for income smoothing purposes.

For the regulatory capital management hypothesis, we use the capital-asset ratio,which is computed as the ratio of total capital to risk-weighted assets. We expect an indeterminate relationship between LLP and $CAP_{i,t}$. To test the signallinghypothesis, we use the one-year ahead percentage change in $EBTP_{i,t}$. We expect a positive sign for the coefficient of this variable. The one-year ahead percentage change in $EBTP_{i,t}$ is proxied by $Sign_{i,t}$ which is computed as;

[19]For robustness, we also use a dummy variable that captures a bank's ownership status and takes a value one if the bank is foreign-owned and zero otherwise

[20]While LLPs could either be discretionary or non-discretionary however, the dataset the dataset we are using does not allow us to disentangle LLPs into their respective components. Previous studies have proxied the non-discretionary component through variables representing the current level and the dynamics of losses within the loan portfolio (see, for example Anandarajan, et al., 2007; Bouvatier and Lepetit 2008; Fonseca and Gonzàles 2008). Further, whereas the provisioning is ideally against the total loans there is no consensus in the literature on the appropriate deflator. In this paper we use the lagged assets deflator is appropriate as it takes into account a bank's actual size with reference to future investments in assets (Ozili, 2017) however, we also experimented with other deflators such as logarithm of LLPs and the results remained qualitatively unchanged.

$$Sign_{i,t} = \frac{(EBTP_{i,t} - EBTP_{i,t-1})}{EBTP_{i,t}} \quad (3)$$

To test the procyclicality of loan loss provisions, we include annual growth in the gross domestic product ($rGDP_t$) at constant prices (Laeven and Majnoni,2003; Fonseca and Gonzàlez, 2008; Fillat and Montoriol-Garriga, 2010; Abdul et al., 2016). A negative coefficient supports the procyclicality of loan loss provisions while a positive coefficient supports the counter-cyclicality of provisions. We also control for bank size and liquidity. To capture the relationship between LLP and size (Size), we use the logarithm of the book value of assets for each bank and is expected to be positively correlated with LLP.We measure liquidity (LIQ) by the ratio of a bank's liquid assets to total assets.

For the bank-level data, our analysis is based onhand-collected annualaudited data of 38 banks (out of 43 banks-see section 2.1) that spans from 2000 to 2018. The choice of annual data is predicated on the availability of bank-specific annual data. The data is obtained from the published bank-level balance sheet and income statement while macro-economic was obtained from the Central Bank of Kenya. A summary of the definition and description of the variables used in the study are presented in the appendix.

5. Empirical Findings and Discussions

Table 1 presents the summary statistics. The mean of loan loss provision stands at 9.1%, implying that banks put aside 9.1 percent of their gross loan portfolio to cover for the incurred losses. The average capital to risk-weighted assets ratio stands at 28.3%. The industry average for the one-year ahead growth in earnings before interest and taxes is 12.2% with the average earnings before interest and taxes being 6.9%. The natural logarithm of total assets is 9.66, and the liquidity ratio is 38.4% while the average loan growth is 12.8% with a non-performing portfolio of 17.2%.

For the study period, the average economic growth is 4.9% while the shareholding structure reveals that 26.5 percent of shares are held by foreigners. When we further disaggregate the LLP provision by bank size and bank ownership, the descriptive statistics reveal that the provisioning is heterogeneous with smaller banks' provision being 6.7% higher than large banks. Provisions among local banks are 8% higher than those of foreign banks while non-pan African banks provisions are 2.5% higher than of pan-African banks (*See Table A1 in the appendix*).

Table 1. Descriptive Statistics

Variable Name	Obs	Mean	Std. Dev.	Min	Max
Loan Loss Provision	567	0.091	0.167	0.001	1.677
Capital ratio	567	0.283	0.149	0.000	1.072
One-year ahead growth rate in	567	0.122	2.582	-54.333	13.277
Earnings before interest and taxes	567	0.069	0.070	-0.119	1.020
Bank Size	567	9.666	1.451	6.672	13.158
Liquidity ratio	567	0.384	0.136	0.033	0.777
Loan growth	567	0.128	0.227	-3.694	0.616
Asset Quality	567	0.172	0.180	0.000	0.872
Lagged Asset Quality	528	0.174	0.181	0.000	0.872
Ownership (% foreign ownership)	567	0.265	0.441	0.000	1.000
Real GDP Annual Growth Rate	567	4.893	2.175	0.232	8.406
Output Gap	567	4.947	0.772	2.900	5.628
Credit Gap	567	0.246	1.603	-3.219	2.494

The bivariate correlations (*results reported in the appendix*) are not high to warrant a series of separate regressions. Our analysis mainly focuses on the relation between the LLP and the explanatory variables. First, we observe that LLPs and the lag are positively and significantly correlated, implying that banks adjust their provisions slowly to recognize the past default history. Provisions are also negatively and significantly correlated with earnings before interest and taxes,

which is an indication that banks do not use it for income-smoothing purposes. On the other hand, provisions are negatively correlated with capital ratio suggesting that when capital is lower banks raise provisions which points to capital management.

Further, provisions and loan growth are negatively and significantly correlated. The same is observed for bank size; the smaller the bank, the higher the provisions. Taken together, the significant negative correlation of bank size and loan growth with provisions implies that large banks have higher loan growth rates and lower non-performing assets and thus provision is less compared to small banks. Also, asset quality and asset quality lag are positive and significantly associated with provisions. Finally, economic growth is negatively and significantly correlated with loan loss provisioning an indication of the procyclical nature of provisioning behaviour. Overall, the correlations between all the other variables are low, hence no risk of multicollinearity.

5.1. Estimation results

We adopt a dynamic panel analysis framework, mainly the Arellano and Bond (1991) Generalized Methods of Moments (GMM) Estimator[21]. This estimator addresses three relevant econometric issues among them unobserved bank-specific effects; the autoregressive data generating process exhibited by provisions, and explanatory variables endogeneity which it addresses it using the instrumental variable approach.

5.1.1 Testing for the choice of GMM estimator

The persistence of the lagged LLP estimation of equation (2) by OLS yields an inconsistent and an upward biased estimate (Hsiao, 2014). Also, the within-group (i.e. random effects) short-panel estimator is biased downwards (Nickell, 1981). Moreover, in panels with a small *T*, the first difference GMM estimator is poorly behaved and problematic as it is subject to a significant downward finite-sample bias (Blundell & Bond, 2000; Bond, Hoeffler and Temple, 2001). To determine the suitability of standard or system GMM estimator, we compare the coefficient of the lagged dependent variable obtained from the four different estimators. The results reveal that the coefficient of the lagged dependent variable under the standard GMM is 0.554 which is lower than the coefficient of the within-group panel estimator whose coefficient is 0.598 and that of the OLS estimator whose coefficient is 0.646.

Similarly, the coefficient of the lagged dependent variable obtained under the standard GMM estimator is lower than that of the within-group panel estimator, suggesting that the estimator is biased downwards. We, therefore, adopt a system GMM estimator of Blundell and Bond (2000) to overcome this inconsistency. To determine the suitability of the system GMM estimator, we compare the coefficients between the standard and the System GMM estimator. The system GMM estimator yields a coefficient of 0.747,which is higher than that obtained under the standard GMM estimator. We estimate equation (2) using the one-step system GMM panel estimator[22]. In estimating our equation of interest, we treat the lagged dependent variable as endogenous but restrict the maximum lag to three to avoid instrument proliferation (Roodman, 2006) while considering one lag for the other bank-level characteristics.

Two critical assumptions underpin the implementation of GMM estimators. First is the exogeneity of instruments and second the absence of second-order correlation. To ensure that these conditions are fulfilled we adopt the Hansen's and Sargan test of over-identifying restrictions, which is

[21]The Arellano Bond, first difference GMM is considered an efficient estimator especially in the presence of heteroscedasticity and helps overcomes the problems of autocorrelation.

[22] Unlike previous studies that includes time dummies, we do not include them in the estimation of equation (2) as their inclusion would net out the cyclical properties that the macroeconomic indicators adopted in the study are meant to test. In addition, the bank and macroeconomic factors are treated as strictly exogenous. This is motivated by the inconclusive evidence in the literature as to whether they should be treated as exogenous or endogenous factors (Skala, 2015). Similarly, we adopt the “collapse option” and the finite sample correction approach of Windmeijer (2005). The system-GMM method employed fits well with the data.

asymptotically distributed as $\chi^2(k)$where k denotes the number of over-identifying restrictions. The Hansen J-test and the Sargan p-value obtained is 0.401 and 0.697 respectively, and the instruments satisfy the exogeneity test. We also test for autocorrelation. The AR (1) test confirms the presence of autocorrelation (p-value equals 0.05), whereas the AR (2) test strongly rejects the presence of autocorrelation of higher-order in the residuals (*see table 2*).

5.1.2. Multivariate Analysis

Table 2 reports the estimation results. First, the bank's provisions adjust partially with the degree of inertia being 25.3 percent, suggesting that the speed of provisions adjustments to the optimal target is fast. Capital is estimated to have a negative and significant coefficient of -0.087, implying that when provisions are lower capital tends to be higher and vice versa. Thus, a one percentage increase in a bank's capital is associated with 8.7 percent decrease in its provisions and supports the view that bank managers use provisions for capital management.

The coefficient for earnings before interest and tax is positive and statistically significant which implies that bank managers use their discretion for income smoothing, either because they want to portray stability of the bank's income or because it is prudent to provision higher when earnings are high. At a micro-level, this supports the view that provisions are counter-cyclical to incomes. The use of provisions for capital management purposes is more pronounced given that the magnitude of its coefficient is higher compared to that of earnings before interest and tax. The one-year ahead forecast of earnings before interest and tax is negative and insignificant, suggesting that managers do not use provisions to signal their future financial strength.

In terms of bank size, we established that the effect on provisions is negative and significant with a coefficient of -0.019, implying that larger banks tend to provision lower than smaller banks. A one percent increase in the total assets of a bank is therefore associated with a 1.9 percent reduction in provisions. Also, banks with higher loan growth set aside higher provisions given its positive significant coefficient of 0.143. Whereas bank size and loan growth are positively correlated, this finding seems counter intuitive. The interaction terms between bank size and loan growth (in column 2) yield the same signs as the uninteracted variables.

The hypothesis that banks with higher liquidity tend to have lower provisions is not supported here. We also find that a higher non-performing loan to the total loan ratio is associated with higher provisions, clearly pointing to prudent risk management among bank managers and consistent with accounting requirements for higher provisions as asset quality deteriorates.

The results further reveal that higher foreign shareholding of banks is positively and significantly associated with higher provisions such that a one percentage increase in a bank's foreign shareholding is associated with a 2.6 percent increase in provisions. The estimated coefficient for GDP growth rate variable is positive and significant at 0.027, suggesting counter-cyclicality in provisioning. The regression estimates thus imply that a one percent increase in GDP growth rate is associated with a 2.7 percent increase in provisions.

Table 2. Estimation Results for Loan Loss Provisions

Variable Name	Notation	(1) System GMM	(2) System GMM
Constant	Con	-0.245***	-0.234***
		(-4.10)	(-3.42)
Lagged Loan Loss Provision	$LLP_{i,t-1}$	0.747***	0.737***
		(3.48)	(3.44)
Capital ratio	$CAP_{i,t}$	-0.087***	-0.085***
		(-3.04)	(-3.08)
1-year ahead growth rate in $EBIT_{i,t}$	$SIGN_{i,t}$	-0.001	0.001
		(-0.08)	(0.02)
Earnings before interest and taxes	$EBIT_{i,t}$	0.033***	0.032***
		(3.12)	(2.95)
Bank Size	$SIZE_{i,t}$	-0.019**	-0.019***
		(-2.71)	(-2.82)
Liquidity ratio	$LIQ_{i,t}$	-0.008	-0.010
		(-0.14)	(-0.18)
Loan growth	$LG_{i,t}$	0.143***	0.054
		(3.48)	(0.29)
Asset Quality	$AQ_{i,t}$	0.244**	0.249**
		(2.19)	(2.25)
Asset Quality Growth Rate	$GR\_AQ_{i,t}$	-0.002	-0.002
		(-0.85)	(-0.87)
Real GDP Growth Rate	$RGDP_t$	0.027**	0.027**
		(2.58)	(2.61)
Foreign Shareholding (%)	$Ownership_{i,t}$	0.026**	0.026**
		(2.34)	(2.36)
Loan growth X Bank size	$LG_{i,t}.\ SIZE_{i,t}$		0.009
			(0.49)
Number of Observations		513	513
Number of Banks		38	38
Number of Instruments		13	14
AR (1) (P-values)		0.000	0.000
AR (2) (P-values)		0.041	0.037
Sargan Test		0.401	0.413
Hansen Test		0.697	0.704

*T-Statistics are in parentheses and significance at the 10%, 5%, and 1% level is noted by *, ** and *** respectively.The estimator adopted is the one-step system GMM with the Windmeijer's (2005) finite sample correction.*

5.2. Robustness checks

For robustness, we implement a battery of models which allows us to test for the existence of heterogeneity among the banks thus reflecting the differences in their characteristics such as bank size and ownership type and the sensitivity of the estimates to different business cycle indicators and model specifications. We therefore examined provisioning behaviour among large versus small banks, foreign versus locally owned banks, pan-African versus non-pan-African banks.

5.2.1. Sensitivity of LLP to Bank Size and Ownership Status

For the purpose of estimation, we categorized banks into two subgroups: small and large banks[23]. The results are reported in Table 3. Overall, the results are qualitatively similar to those reported in Table

[23] The large small bank dichotomy is constructed based on the median bank size (with size being measured as the total assets of the bank). A bank whose total assets is below the median size is considered a small bank while those whose total assets is greater than the median is considered big banks.

2. However, several novel findings emerge. Small-sized banks, do not use provisions for capital management. Also, unlike small banks, large banks use loan loss provisions for income smoothing purposes, and neither small nor large banks use provisions for signalling purposes. Of utmost importance is the fact that the coefficient on loan growth is higher among large than small banks which suggests that higher loan growth rate among the large banks is associated with higher provisioning than among small banks.

A higher proportion of distressed assets (i.e. high non-performing loans) is associated with higher provisions among smaller banks than in large banks. Small foreign-owned banks also provision higher than large foreign-owned banks. More importantly, we establish that non-pan-African banks provision more than pan-African banks as their share of foreign shareholding increases. A one percentage increase in foreign shareholding of non-pan-African Banks is associated with a significant 3.8 percentage increase in provisions, but for pan-African banks, we observe a non-significant 1.2 percent increase. Finally, we find support for the provision's counter-cyclicality, which is more pronounced among small banks and non-pan-African banks. Procyclicality among pan-African banks is not supported by the study findings.

Table 3. The sensitivity of Loan Loss Provisioning Behaviour to Bank Size and Ownership Status

Variable Name	Notation	(1) Small Banks	(2) Large Banks	(3) Pan-African Banks	(4) Non-Pan-African Banks
Constant	Con	-0.250	-0.092***	-0.033	-0.254***
		(-0.77)	(-2.81)	(-0.24)	(-3.64)
Lagged Loan Loss Provision	$LLP_{i,t-1}$	0.576	0.919***	0.401	0.722***
		(1.52)	(9.48)	(2.23)	(3.33)
Capital ratio	$CAP_{i,t}$	-0.073	-0.069***	-0.023	-0.085**
		(-1.19)	(-3.11)	(-0.65)	(-2.62)
1-year ahead growth rate in $EBIT_{i,t}$	$SIGN_{i,t}$	0.001	0.001	-0.000	0.003
		(0.34)	(0.18)	(-1.88)	(1.22)
Earnings before interest and taxes	$EBIT_{i,t}$	0.058	0.019**	-0.013	0.035***
		(1.19)	(2.05)	(-0.94)	(2.74)
Bank Size	$SIZE_{i,t}$	-0.042**	-0.013*	0.015	-0.019**
		(-2.47)	(-1.89)	(1.25)	(-2.31)
Liquidity ratio	$LIQ_{i,t}$	-0.048	0.019	0.037	-0.024
		(-0.54)	(0.86)	(0.61)	(-0.36)
Loan growth	$LG_{i,t}$	0.089	0.148***	0.055	0.138***
		(1.10)	(4.36)	(0.76)	(3.17)
Asset Quality	$AQ_{i,t}$	0.288*	0.136*	0.225**	0.268**
		(1.90)	(1.77)	(5.01)	(2.24)
Asset Quality Growth Rate	$GR\_AQ_{i,t}$	-0.001	-0.015*	-0.006***	-0.001
		(-0.97)	(-1.93)	(-8.56)	(-0.81)
Real GDP Growth Rate	$RGDP_t$	0.033***	0.009***	-0.008	0.026**
		(2.96)	(3.86)	(-0.98)	(2.49)
Foreign Shareholding (%)	$Ownership_{i,t}$	0.046**	0.015**	0.012	0.038**
		(2.14)	(2.23)	(1.13)	(2.41)
Number of Observations		238	275	56	457
Number of Banks		30	31	4	34
Number of Instruments		13	13	13	13
AR (1) (P-values)		0.010	0.102	0.118	0.000
AR (2) (P-values)		0.031	0.297	0.243	0.055
Sargan Test		0.061	0.004	0.311	0.388
Hansen Test		0.252	0.363	1.000	0.694

*T-Statistics are in parentheses and significance at the 10%, 5%, and 1% level is noted by *, ** and *** respectively.The estimator adopted is the one-step system GMM with the Windmeijer's (2005) finite sample correction.*

5.2.2. Sensitivity of LLP to Different Model Specifications

To ensure the results are robust to different model specifications, we report the estimates obtained from pooled OLS and fixed effects panel estimator and the two-step system GMM in Table 4 Columns 1-4. In column 5, the model includes a dummy variable to examine the effect of the 2008 global financial crisis; clearly, we do not find evidence of a difference in provisioning behaviour in the pre and post-global financial crisis in contrast with others that finds evidence that the global financial crisis may have triggered higher provisions. The results of the other models (presented in column 1-4) and those in column 5 show that the results obtained are qualitatively similar with no changes in signs for all the variables.

Table 4. Sensitivity of LLP to Different Model Specifications

Variable Name	**Notation**	(1) **Pooled OLS**	(2) **Fixed Effects**	(3) **Random Effects**	(4) **Two-Step system GMM**	(5) **Two-Step system GMM**
Constant	Con	-0.096***	0.063	-0.096***	-0.250***	-0.122***
		(-3.45)	(0.05)	(-3.45)	(-3.97)	(-2.78)
Lagged Loan Loss Provision	$LLP_{i,t-1}$	0.646***	0.598***	0.646***	0.719***	0.956***
		(31.12)	(25.61)	(31.12)	(3.10)	(4.05)
Capital ratio	$CAP_{i,t}$	-0.049***	-0.045**	-0.049***	-0.083***	-0.172***
		(-3.09)	(-2.18)	(-3.09)	(-2.96)	(-2.89)
1-year ahead growth rate in $EBIT_{i,t}$	$SIGN_{i,t}$	0.000	-0.000	0.000	-0.000	0.001
		(0.01)	(-0.17)	(0.01)	(-0.07)	(0.08)
Earnings before interest and taxes	$EBIT_{i,t}$	0.014**	0.013*	0.014**	0.035***	0.030***
		(2.39)	(1.96)	(2.39)	(3.38)	(2.94)
Bank Size	$SIZE_{i,t}$	-0.005	-0.004	-0.005	-0.020***	-0.020**
		(-1.43)	(-0.77)	(-1.43)	(-2.92)	(-2.32)
Liquidity ratio	$LIQ_{i,t}$	-0.004	-0.099***	-0.004	-0.017	0.136**
		(-0.20)	(-3.27)	(-0.20)	(-0.32)	(2.13)
Loan growth	$LG_{i,t}$	0.099***	0.094***	0.099***	0.134***	0.187***
		(10.64)	(9.61)	(10.64)	(3.68)	(4.61)
Asset Quality	$AQ_{i,t}$	0.262***	0.308***	0.262***	0.252**	0.136
		(14.69)	(15.23)	(14.69)	(2.10)	(1.16)
Lagged Asset Quality	$AQ_{i,t-1}$	-0.001	-0.001	-0.001	-0.002	0.022
		(-0.57)	(-0.75)	(-0.57)	(-0.79)	(1.61)
Real GDP Growth Rate	$RGDP_t$	0.001	0.002	0.001	0.028**	0.001
		(1.13)	(1.64)	(1.13)	(2.41)	(1.12)
Foreign Shareholding (%)	$Ownership_{i,t}$	0.012**	-0.465	0.012**	0.027**	0.002
		(2.07)	(-0.11)	(2.07)	(2.42)	(0.37)
GFC Crisis (=1 post-2008, 0 otherwise)	$Crisis_t$					0.017**
						(2.50)
Number of observations		513	513	513	513	513
Number of Banks		38	38	38	38	38
Number of Instruments					14	14
AR (1) (P-values)					0.038	0.043
AR (2) (P-values)					0.450	0.450
Sargan Test					0.310	0.381
Hansen Test					0.888	0.882

*The t-statistics are presented in parentheses and are clustered at the bank-level to account for heteroscedasticity. Significance at the 10%, 5%, and 1% level is noted by *, ** and *** respectively.*

6. Conclusions

Existing literature shows that excessive credit growth is particularly prevalent in emerging economies. The way banks provision for impaired loans has a strategic impact on their reported earnings and capital and has been investigated by previous literature. That notwithstanding, empirical results on these issues are not consistent and are mainly focused on US banks. In this paper, we investigated the determinants of LLP in Kenya for a sample of 38 banks over the period 2000–2018. We also did a comparative analysis between large and small banks and domestic versus foreign institutions to investigate differences in the overall provisioning policies. To explore these issues, we applied the dynamic models of panel data and implemented a system method of moments (GMM) estimator.

Overall, we find evidence that; (i) banks use provisions for capital management purposes but this finding is sentitive to bank size and ownership status. (ii) earnings management influences provisioning decisions but this is sensitive to bank size. Unlike small banks, large banks use loan loss provisions for income smoothing purposes; (iii) Higher foreign shareholding of banks is positively associated with higher provisions with small foreign-owned banks provisioning higher than large foreign-owned banks. More importantly, non-pan-African banks provisions are higher than pan-African banks as foreign shareholding increases. (iv) LLPs reflect changes in the quality of the banks' loan portfolio, measured by the amount of non-performing loans; (v) Provisioning among banks are counter-cyclical and is more pronounced among small banks and non-pan-African banks but procyclical among pan-African banks.

These study findings have important policy implications for the supervision of Kenyan banks going forward. First, considerable heterogeneity in the discretionary use of provisions by bank managers in the application of the incurred loss model of IAS 39 implies that even post-transition to the expected credit loss model of provisioning as envisaged by IFRS 9, a significant deal of discretionary may exist. This calls for considerable efforts to ensure uniformity in the application of the provisioning frameworks. Further, these findings ignite new directions for future research on earnings and capital management. For instance, the current debate is about whether the benefits of earnings management outweigh costs (Goel and Thakor, 2003), but no one points to the fact that earnings management lowers the quality of accounting data. The empirical evidence uncovered in this paper points to the need for a sound accounting framework. A well-thought design of an earnings management that improves the quality of accounting data disentangles the debate around the costs and benefits of earnings management

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Appendix

Table A1: Ownership and Asset Base of Commercial Banks (USD' 000')

Ownership	Number	% of Total	Total Net Assets	% of the Total
Domestic Public Commercial Banks	3	7.5%	1,379	3.5%
Domestic Private Commercial Banks	22	55.0%	25,593	64.8%
Foreign Banks	15	37.5%	12,545	31.7%
Total	**40**	**100%**	**36,489**	**100%**

Source: Central Bank of Kenya (CBK) Annual Bank Supervision Report (2017).

Table A2: Cross-border banking

Bank	Country of Operations	Year of establishment.
Kenya Commercial Bank	Tanzania South Sudan Uganda Rwanda Burundi	1997 2006 2008 2009 2012
Co-operative Bank	Tanzania Uganda	2004 2012
Equity Bank	Uganda South Sudan Rwanda Tanzania DRC Congo	2008 2008 2011 2012 2015
NIC Bank	Tanzania Uganda	2004 2012
CFC-Stanbic Bank	South Sudan	2013
Commercial Bank of Africa	Tanzania Uganda	2007 2013
Family Bank	South Sudan	2013

Source: *Various banks' websites.*

Table A3: Variable Description and Hypothesis

Variable Name	Notation	Description and Measurement	Hypothesis Tested	Apriori Sign
Loan Loss Provision	$LLP_{i,t}$	Ratio of Loan Loss provision to lagged total assets	-	
Lagged Loan Loss Provisions	$LLP_{i,t-1}$	Lagged ratio of Loan Loss provision to lagged total assets	-	+
Capital ratio	$CAP_{i,t}$	Ratio of capital to risk-weighted assets	Capital management	+/-
One-year ahead growth rate in $EBIT_{i,t}$	$SIGN_{i,t}$	One-year ahead growth rate in $EBIT_{i,t}$	Signalling	-
Earnings before interest and taxes	$EBIT_{i,t}$	Ratio of Earnings before interest and taxes to total assets	Income smoothing	+
Bank Size	$SIZE_{i,t}$	Natural Logarithm of total assets	-	+
Liquidity ratio	$LIQ_{i,t}$	The ratio of liquid assets to total assets	-	+
Loan growth	$LG_{i,t}$	Growth in the total loans of a bank	-	+
Asset Quality	$AQ_{i,t}$	The ratio of non-performing loans to lagged total loans	-	+
Lagged Asset Quality	$AQ_{i,t-1}$	Lagged ratio of non-performing loans to lagged total loans	-	+
Bank Ownership	$Ownership_{i,t}$	Foreign shareholding of a bank as a share of the total outstanding shares	-	-/+
Real GDP Annual Growth Rate	$RGDP_t$	Real Gross Domestic Product Annual Growth rate	Cyclicality of LLPs	-
Output gap	$GDP\ gap_t$	Deviation of GDP from its long-term trend	Cyclicality of LLPs	-
Credit-to-GDP growth	$C.GDP_t$	Credit to the private sector as a % of GDP	Cyclicality of LLPs	-
Credit-to-GDP growth gap	$C.GDP\ gap_t$	Deviation of the Credit to the private sector as a % of GDP from its long-term trend	Cyclicality of LLPs	-

Table A4. Descriptive Statistics bybank size and ownership

Panel A. Summary Statistics of Small banks

Variable Name	N	Mean	Std. Dev.	Min	Max
Loan Loss Provision	281	0.124	0.184	0.001	1.677
Capital ratio	281	0.329	0.174	0.000	0.942
One-year ahead growth rate in	281	-0.039	3.471	-54.333	9.489
Earnings before interest and taxes	281	0.070	0.095	-0.119	1.020
Bank Size	281	8.451	0.628	6.672	9.406
Liquidity ratio	281	0.394	0.147	0.099	0.777
Loan growth	281	0.117	0.180	-0.892	0.572
Asset Quality	281	0.234	0.200	0.000	0.872
Lagged Asset Quality	249	0.244	0.205	0.000	0.872
Real GDP Annual Growth Rate	281	4.554	2.406	0.232	8.406
Output Gap	281	4.670	0.845	2.900	5.628
Credit Gap	281	0.211	1.794	-3.219	2.494

Panel B. Summary Statistics of Large Banks

Variable Name	N	Mean	Std. Dev.	Min	Max
Loan Loss Provision	286	0.058	0.140	0.002	1.123
Capital ratio	286	0.238	0.101	0.003	1.072
One-year ahead growth rate in	286	0.279	1.161	-3.208	13.277
Earnings before interest and taxes	286	0.067	0.026	-0.046	0.129
Bank Size	286	10.860	0.951	9.415	13.158
Liquidity ratio	286	0.374	0.124	0.033	0.717
Loan growth	286	0.139	0.266	-3.694	0.616
Asset Quality	286	0.111	0.131	0.000	0.807
Lagged Asset Quality	279	0.112	0.129	0.000	0.790
Real GDP Annual Growth Rate	286	5.227	1.867	0.232	8.406
Output Gap	286	5.220	0.577	2.900	5.628
Credit Gap	286	0.280	1.392	-3.219	2.470

Panel C. Summary Statistics of Foreign banks

Variable Name	N	Mean	Std. Dev.	Min	Max
Loan Loss Provision	150	0.032	0.040	0.002	0.200
Capital ratio	150	0.296	0.127	0.132	0.689
One-year ahead growth rate in	150	-0.186	4.483	-54.333	1.931
Earnings before interest and taxes	150	0.064	0.024	-0.024	0.129
Bank Size	150	10.215	1.258	7.975	12.494
Liquidity ratio	150	0.497	0.154	0.256	0.777
Loan growth	150	0.131	0.148	-0.463	0.572
Asset Quality	150	0.099	0.124	0.007	0.618
Lagged Asset Quality	140	0.100	0.127	0.007	0.618
Real GDP Annual Growth Rate	150	4.884	2.185	0.232	8.406
Output Gap	150	4.948	0.773	2.900	5.628
Credit Gap	150	0.244	1.605	-3.219	2.470

Panel D. Summary Statistics of Local banks

Variable Name	N	Mean	Std. Dev.	Min	Max
Loan Loss Provision	417	0.112	0.189	0.001	1.677
Capital ratio	417	0.279	0.156	0.000	1.072
One-year ahead growth rate in	417	0.232	1.351	-9.250	13.277
Earnings before interest and taxes	417	0.070	0.080	-0.119	1.020
Bank Size	417	9.469	1.466	6.672	13.158
Liquidity ratio	417	0.343	0.102	0.033	0.717
Loan growth	417	0.127	0.250	-3.694	0.616
Asset Quality	417	0.199	0.189	0.000	0.872
Lagged Asset Quality	388	0.201	0.190	0.000	0.872
Real GDP Annual Growth Rate	417	4.897	2.174	0.232	8.406
Output Gap	417	4.947	0.773	2.900	5.628
Credit Gap	417	0.247	1.604	-3.219	2.494

Panel C. Summary Statistics of Pan-African Banks

Variable Name	N	Mean	Std. Dev.	Min	Max
Loan Loss Provision	60	0.069	0.063	0.003	0.214
Capital ratio	60	0.257	0.148	0.107	1.072
One-year ahead growth rate in	60	-0.749	7.075	-54.333	1.290
Earnings before interest and taxes	60	0.051	0.026	-0.027	0.104
Bank Size	60	10.655	1.458	7.872	13.158
Liquidity ratio	60	0.354	0.062	0.240	0.502
Loan growth	60	0.165	0.175	-0.463	0.497
Asset Quality	60	0.195	0.183	0.015	0.618
Lagged Asset Quality	56	0.200	0.188	0.015	0.618
Real GDP Annual Growth Rate	60	4.884	2.196	0.232	8.406
Output Gap	60	4.948	0.777	2.900	5.628
Credit Gap	60	0.244	1.613	-3.219	2.470

Panel D. Summary Statistics of Non-Pan African Banks

Variable Name	N	Mean	Std. Dev.	Min	Max
Loan Loss Provision	507	0.093	0.175	0.001	1.677
Capital ratio	507	0.286	0.149	0.000	0.942
One-year ahead growth rate in	507	0.225	1.232	-9.250	13.277
Earnings before interest and taxes	507	0.071	0.073	-0.119	1.020
Bank Size	507	9.549	1.406	6.672	12.775
Liquidity ratio	507	0.387	0.142	0.033	0.777
Loan growth	507	0.123	0.232	-3.694	0.616
Asset Quality	507	0.170	0.179	0.000	0.872
Lagged Asset Quality	472	0.171	0.180	0.000	0.872
Real GDP Annual Growth Rate	507	4.895	2.175	0.232	8.406
Output Gap	507	4.947	0.773	2.900	5.628
Credit Gap	507	0.246	1.603	-3.219	2.494

Table a5. Pearson Correlation Matrix

Variables	*LLP*	*lag LLP*	*CAP*	*SIGN*	*EBIT*	*SIZE*	*LIQ*	*LG*	*AS*	*lag AS*	*Own*	*RGDP*	*RGDP Gap*	*Credit Gap*
LLP	1													
Lag LLP	0.9010*	1												
CAP	-0.1060*	-0.05	1											
SIGN	-0.05	-0.05	0.0086	1										
EBIT	-0.0965*	-0.0923*	-0.0004	0.0132	1									
SIZE	-0.2656*	-0.2820*	-0.3274*	0.057	-0.0564	1								
LIQ	-0.2664*	-0.2390*	0.3239*	0.0317	-0.0238	-0.0331	1							
LG	-0.1089*	-0.3159*	0.1311*	0.0746	0.0315	0.0589	-0.0775	1						
AS	0.6301*	0.6200*	0.0574	-0.032	-0.1031*	-0.4134*	-0.2913*	-0.1255*	1					
GR_AS	0.5828*	0.7121*	0.0997*	-0.0055	-0.1077*	-0.4416*	-0.2489*	-0.2369*	0.8743*	1				
Ownership	-0.2186*	-0.2292*	0.0868*	-0.0843*	-0.0634	0.1899*	0.5562*	-0.0052	-0.2359*	-0.2361*	1			
RGDP	-0.0859*	-0.04	-0.0391	0.0405	-0.0041	0.1972*	0.0414	0.0288	-0.1931*	-0.0981*	-0.003	1		
RGDP Gap	-0.2020*	-0.2239*	-0.0694	0.0688	0.0055	0.4327*	-0.0034	0.0915*	-0.4064*	-0.4113*	0.0004	0.6616*	1	
Credit Gap	0.03	-0.03	0.0358	-0.0615	0.0255	0.0166	-0.0083	0.0683	0.0682	0.002	-0.0009	0.0685	-0.1274*	1

Note: * Coefficients are statistically significant at the 5% level