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, little is known on this topic in the African banking context and specifically Kenya's banking industry. Using hand-collected annual bank-level data for the period 2002-2018, this paper investigates whether provisioning behaviour depends on banks' idiosyncratic or systematic factors. The study also investigates whether provisioning is pro or counter-cyclical through business and credit cycles and whether provisioning behaviour is heterogeneous for different bank groups. Estimation results reveal that provisions are used for capital and earnings management, but the findings are sensitive to bank size and ownership status. Further, the evidence suggests that provisioning reflects changes in asset quality and is counter-cyclical to the business cycle.

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

JEL Classification: G21; G28; M41.

1. Introduction

Banks play a significant role in financial intermediation. They mobilize savings and channel funds to finance consumption and investment. In the process, they bear the burden of credit risk when borrowers default. To address this risk, banks keep aside provisions that act as a revenue buffer against anticipated loan losses, also known as loan loss provisions (Laeven and Majnoni, 2003). On the downside, loan loss provisions (LLPs) affect a bank's profitability and capital negatively as they are treated as cost items that reduce a bank's asset position (Quagliariello, 2007).

Provisioning may be exacerbated by business cycles, thereby generating negative macroeconomic shocks. This may lead to increased systemic risk since credit risk tends to rise in economic downturns (Berger and Udell, 2004). During economic expansion, banks' profit tends to rise, which triggers demand for loanable funds. Banks tend to underestimate their exposures to credit risk as they often relax screening and monitoring of borrowers. As a result, LLPs tend to be lower. As the economy cools, borrowers' profitability declines and the effect is two-fold. First, asset quality deteriorates and, second, the bank's equity position declines (Murcia and Kohlscheen, 2016). To address asset deterioration, banks increase provisions but may also cut lending, which amplifies economic downturn (Betancourt and Baril, 2009).

This paper seeks to achieve three objectives. First, we investigate whether provisioning behaviour depends on idiosyncratic or systematic factors. Second, we investigate whether provisioning is pro or counter-cyclical through business and credit cycles. Third, we investigate whether provisioning behaviour is sensitive to bank type (i.e. foreign vs domestic) and size (large vs small).

The 2007-2009 global financial crisis demonstrates the importance of countercyclical regulation since the financial shocks witnessed in banks and financial markets was very destabilizing. Thus, keeping aside sufficient reserves to cover for potential impairment of loans should be countercyclical to enable banks with less access to liquidity facilities to stay solvent during bursts (Drehmann et al, 2010). The impact of the crisis has, however, brought to the fore concerns regarding International Financial Reporting Standards (IFRS). LLPs can be forward-looking, contingent on expected losses also known as dynamic provisioning or backward looking, contingent on losses incurred during operations (Bouvatier and Lepetit, 2012). Forward-looking provisioning is countercyclical and hence earnings' management is significantly reduced (Leventis et al, 2011). Despite the Basel Committee advocating for adoption of forward-looking framework, several countries including Kenya still use the backward-looking framework, hence underestimating loan losses during economic expansions.

Despite provisioning being important in mitigating credit risk, LLPs are not necessarily driven by credit risk (Murcia and Kohlscheen, 2016). First, banks have a discretion in the determination of the amount of LLPs, which can lead to opportunistic financial reporting. Second, banks may influence or manipulate LLPs to signal loan quality, manage capital and reduce variability of income. Third, banks' high leverage implies that their assets are vulnerable to volatility, prompting sufficient LLPs, which becomes banks' main accrual. The expectation is that high leverage and provisions should insulate the industry from contagion in the event of a bank collapse. But very high LLPs reduce the reported earnings. On the contrary, low provisions boost profit but banks must deplete capital to ameliorate losses (Laeven and Majnoni, 2003). This translates to a trade-off where LLPs simultaneously influence both profitability and risk.

There are two studies that are closely related to this paper. Murcia and Kohlscheen (2016) and Hessou et al (2019) found that provisions are procyclical among banks and microfinance institutions, respectively. We extend these studies several ways. First, using a country-specific investigation, we explicitly model how differences in 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.

There are several reasons that justify research on the Kenyan banking industry. First, provisioning policies have implications on banks' stability and overall financial stability. Kenya is the main financial hub for East and Central Africa. Further, the country is the source of cross-border banking within East and Central Africa, which exposes the entire region to possible systemic/contagion effects in the event of a bank collapse. Even though cross-border banking may boost access to finance in the host nation (Beck et al, 2014), enhance competition and financial stability (Léon, 2016; Bremus, 2015), the converse is also true. Provisions should therefore insulate the banking sector from contagion effect. Second, the financial system is more bank-oriented and deeply entrenched within the economy, so that developments within the banking industry may have severe macroeconomic effects (Mwega, 2014). Third, although a vast literature exists at the global level (see Ozili and Outa, 2017), less attention has been paid to the banking industry in developing countries, especially those in Africa.

Existing literature points to four drivers of managerial discretionary behaviour concerning LLPs: income smoothing, signaling, capital regulation and taxes (Ozili and Outa, 2017). Yet, with the exception of tax motivation, which has mainly focused on US banks, empirical evidence finds contrasting results (see for example Caporale et al, 2018; Ozili, 2017; Bryce et al, 2015; Lee and Hsieh, 2013; Guidara et al, 2013; Acar and Ipci 2015; Pérez et al, 2008). Motivated by these concerns, this paper sought to understand three fundamental questions on LLPs in the Kenyan banking industry: (i) does the provisioning behaviour depend on banks idiosyncratic factors in addition to

systematic factors? (ii) Does provisioning run pro- or counter-cyclical through business and credit cycles? (iii) How sensitive is provisioning to bank size and ownership? These questions highlight an important but relatively under-examined research agenda in the context of a developing economy.

This study has established that banks in Kenya use provisions for earnings and capital management. Foreign shareholding is associated with higher provisions, provisioning is counter-cyclical and reflects variations in the quality of assets. More importantly, pan-African banks do not use LLPs for capital or earnings management.

This paper responds to an existing gap in the empirical literature linking systematic and banks idiosyncratic factors to provisioning behaviour three-fold. First, non-performing loans (NPLs) and LLPs are the main channels of transmission of macroeconomic shocks to bank's revenue. Therefore, uncovering the determinants and behaviour of LLPs is important for designing provisioning policies. Second, the study findings will shed more light on the policy debate regarding IFRS provisioning, whose drawback is the procyclical pattern and more so with the coming into force of IFRS 9. Third, we contribute to the policy debate on how to design appropriate macro-prudential regulation for the whole financial system. For example, should the study findings reveal that business cycles influence provisioning behaviour, bank supervision may need to be enhanced during economic downturn when banks become fragile. However, should the bank's reaction to macroeconomic shocks worsen the effects of the recession, the Central Bank of Kenya (CBK) may have to establish regulations that reduce the procyclicality of the bank's operations. Thus, this study translates the empirical findings into instruments for policy reform and decision-making.

The remainder of this paper is structured as follows. The next section presents stylized facts. Section 3 presents a brief review of the literature and hypothesis development. Section 4 presents the methodology and data employed. Estimation and discussion of the results is presented in section 5. Section 6 concludes. Throughout the paper, the terms "earnings' management" and "income smoothing" are used interchangeably.

2. Stylized facts

Structure of the Kenyan banking sector

The banking industry in Kenya comprises 41 institutions: 40 banks, one mortgage finance company, nine foreign banks' representative offices and 14 deposit-taking microfinance institutions (Table 1). With a total asset base of US$ 36.5 million, the banking industry contributes 7% of the Gross Domestic Product (GDP).

Table 1: Asset base and ownership structure of banks (US$ '000)

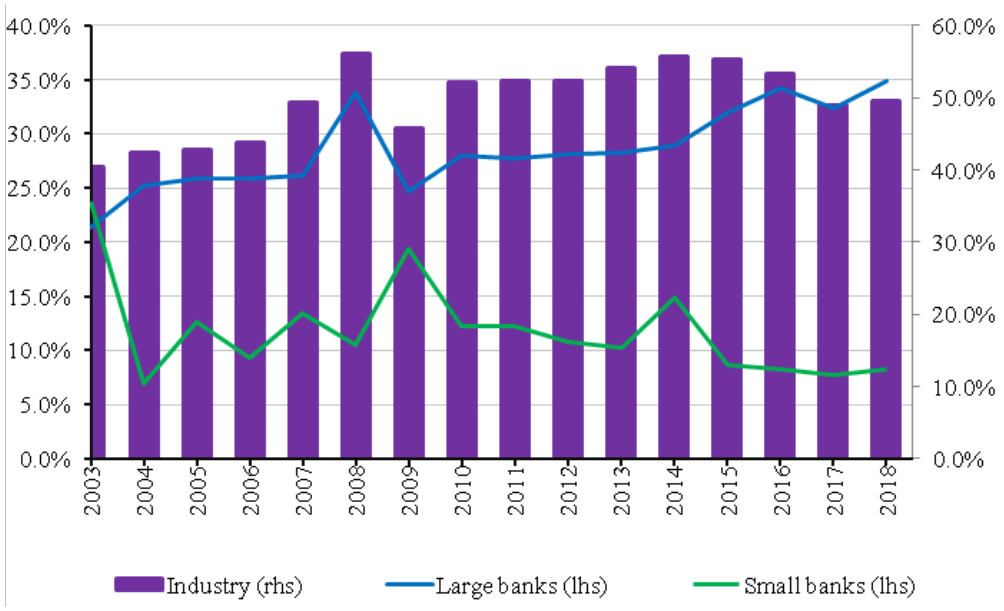
Ownership	Number	% of Total	Total Net Assets	% of the Total
Domestic Public Commercial Banks	3	7.5%	1,379	3.5%
Domestic Private Commercial Banks	22	55.0%	25,593	64.8%
Foreign Banks	15	37.5%	12,545	31.7%
Total	**40**	**100%**	**36,489**	**100%**

Source: Central Bank of Kenya - CBK (2020), Annual Bank Supervision Report

Although asset growth has been on upward trajectory, the growth is not homogenous, with large banks recording the fastest growth (Figure 1).

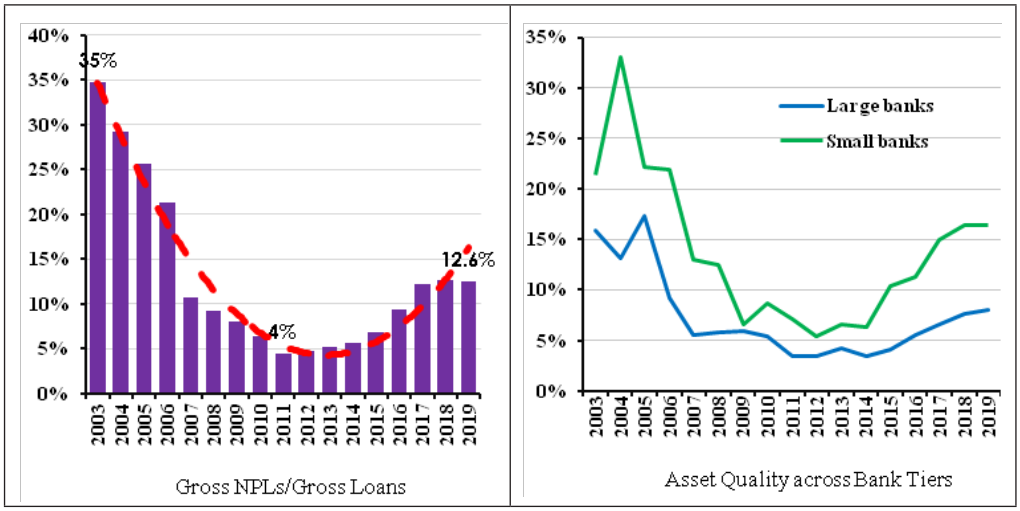
Confronted by policy uncertainty, banks convey information to the investors about the loan portfolios (Ng et al, 2020). The trends in Figure 2 reflect differences in asset quality as banks adopt forward-looking provisioning standard under IFRS 9. Figure 2 shows a significant reduction in non-performing loans from 35% to 4% for the period 2003-2011. This may be attributed to policy reforms under strict regulatory regime, resulting in improved credit appraisal standards and reduction of information asymmetry between lenders and borrowers. These reforms include the introduction of credit information sharing in 2010. The gains were, however, short-lived since NPLs have been on an upward trajectory since 2012. Further, NPLs remain high at double-digits among small banks. It may be the case that poor economic growth, which has implications on the banks' risk attitude could have ignited the adjustments regarding loan portfolio growth, compliance to regulatory capital and shareholder expectations.

Figure 1: Banking industry's assets as % of nominal GDP



Source: Central Bank of Kenya (Various years), Annual Bank Supervision Reports

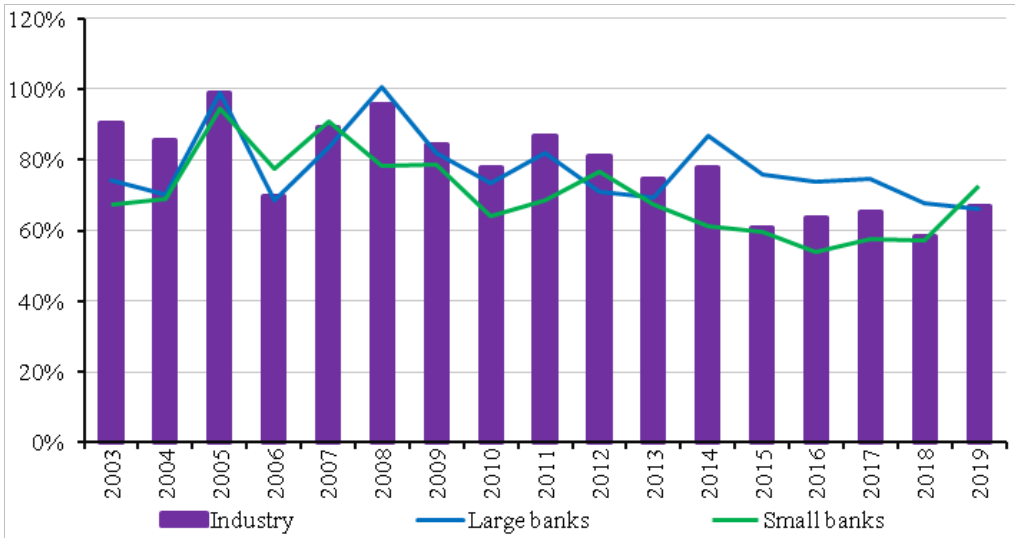
Figure 2: Asset quality



Source: Central Bank of Kenya (Various years)

Although large banks have, on average, recorded lower levels of NPLs, provisioning nevertheless remains high (Figure 3). This lends credence to Anandarajan et al (2003), who documents that provisions are higher in large banks due to the scale of the intermediation.

Figure 3: Loan loss provisions



Source: Central Bank of Kenya (Various Years), Annual Bank Supervision reports

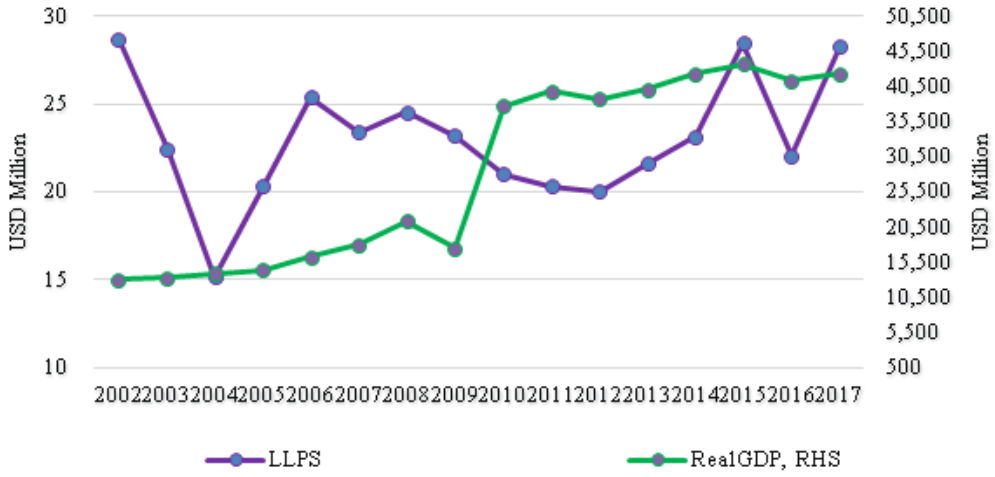
Regulatory and institutional monitoring of LLPs

The examination of provisioning is critical for monitoring the health of a financial system not only because it represents the most significant accounting expense but also because it both erodes the bank's ability to lend, and 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. Figure 4 shows that LLPs are cyclical to the business cycles. This implies that bank capitalization declines at the trough of the business cycle, which amplifies the procyclicality of LLPs (Murcia and Kohlscheen, 2016). The period 2013-2017 is characterized by a persistent rise in NPLs, necessitating more LLPs.

Before the adoption of expected loan loss model for credit impairment as required under IFRS 9, banks in Kenya used the incurred loss model under the International Accounting Standard (IAS) 39. This framework, which is operationalized by CBK Prudential Guidelines, requires banks to regularly monitor their assets portfolio and ensure provisions for impaired credit is adequate. Under this framework, a bank's provision can take two forms: specific or general. A specific provision is set aside for a loss that has already materialized. However, if the loss is latent and cannot be ascribed to any individual loan, a bank can set aside a general provision.

The guideline mandates banks board of directors 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 are based on internal risk rating systems, the guidelines are aligned to the Prudential Guidelines. Based on the borrower's repayment capacity, loans are classified under five categories for provisioning purposes: normal, watch, sub-standard, doubtful and loss.

Figure 4: Loan loss provisioning and business cycles



Under these categories, different rules apply. For example, 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. However, if reliable information exists, then higher provisions are set aside based on the information available. More importantly, the minimum provisions are guided by multiple factors, among them an institution's past loan loss record, prevailing economic environment, non-performing asset trends and remedial policies.

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

Basel regulations

Atellu, Muriu and Sule (2021) show that prudential regulations are significant drivers of banking stability in Kenya. 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 this compliance was set to 1992, its adoption was staggered by two years with the implementation year being 1994 through the amendment of sector four of the Banking Amendment Act of 1989. Further, a wave of bank failures in 1998 triggered an increase in the minimum capital risk-weighted to US$ 2.7 million, which was to be achieved by December 1999. In the year 2000, the minimum capital was further raised to US$ 3.2 million. In 2004, Basel

II was introduced; however, its adoption, especially among emerging and frontier economies, was voluntary (Mwega, 2014). Despite selective adoption, prudential guidelines were amended in 2006 to strengthen banking regulations (Upadhyaya, 2017). In 2007, a supervisory infrastructure roadmap for the adoption of Basel II was issued by the CBK.

With the onset of global financial crisis, new requirements for core capital were imposed. The adoption of the amendments was to be progressively adjusted. By 2009, the CBK required banks to have a minimum capital of US$ 1.3 million, a minimum capital of US$ 1.9 million by 2010[1], US$ 2.3 million by 2011 and US$ 3.0 million by 2012. The Banking Act that was amended in 2012 introduced a provision allowing for the prescription of the minimum capital adequacy ratio and aligned the bank's financial reporting to the IFRS.

The prudential guidelines were further amended in 2013[2], where the new guidelines combined Basel II and III capital adequacy standards. In 2013, the Banking Act was amended to ensure the independence of the CBK, thus strengthening the supervisory framework by allowing it to develop and implement additional regulations. Further, risk management guidelines were introduced in 2013 but were yet to consider the adoption of counter-cyclical macro-prudential regulations.

With Basel I and II standards not fully implemented, Basel III standards on contingency capital ratios, net stable funding ratio and guidelines on systemically important banks are yet to be adopted, but banks have nevertheless implemented a capital buffer of 2.5%. Banks that met the minimum capital adequacy ratio but with low conservation buffers should have put in place prudent retention policies on earnings and minimum conservation buffer ratios by 2016.

3. Literature review

Income smoothing

This strand examines the earnings-provisioning nexus. The focus is on whether banks understate or overstate provisions so that the earnings are neither too high nor too low. Managers can manipulate the reported earnings to influence the external investors' information set (Amihud and Lev, 1981). Banks therefore use provisions to smoothen earnings and to meet prudential regulatory objectives (Andries et al, 2017).

Theoretical underpinning on the use of provisions for earnings' management is limited. The market microstructure theory provides an explanation for income smoothing where income volatility amplifies information asymmetry between banks and investors, and between market makers and privately informed investors. When labour and financial markets are strong-form efficient and central banks rely on timely market-value information, bank managers will not have an incentive to manage reported earnings. Published accounting statements will therefore not influence regulators or markets in their evaluation of banks. Theoretically, this is a realistic point of departure for assessing income smoothing behaviour based on the available banks' incentives to manage earnings. For strong-form efficient to hold in labour and financial markets, the marginal cost of sourcing and analysing information must be zero. But when costly, investors weigh the costs vis a vis the gains. Dye (1988) for example provides a framework in which income smoothing can enhance shareholder wealth when: (i) the cost-minimizing contract provides the managers with an incentive to maximize firm value but which could also encourage income smoothing; (ii) the bank may as well enhance the contractual terms with outsiders through earnings management.

Further theoretical proposition has been provided by Degeorge and Richard (1999). In their two-period model, managers report earnings in a way that ensures they maximize their own compensation. They begin their analysis with latent earnings. Ideally, this is revenue that the bank would realize if the provisions were set at the correct value. In this case, the bank's latent earnings reflect either of the following outcomes: (i) the banks operating beyond the target reduce reported earnings to report higher earnings in the next period; (ii) bank's targeted income could be far below the threshold that managing earnings to achieve the targeted values would be too costly. The bank therefore reports income, which is less than the latent earnings; (iii) if the

targeted income is lower than the target but reaching the target is not too costly, banks enhance reported earnings to achieve the target. Along the same vein, Koch and Wall (2000) develop a two-period model of the use of loan loss provisioning in which banks maximize expected earnings, but this is subject to constraints imposed by auditors with four different outcomes, namely: (i) banks move away from their earnings target; (ii) banks minimize loan losses to report the highest possible income; (iii) in the first period, banks move towards their reported earnings target; (iv) the occasional big bath.

Existing empirical literature suggests that banks use LLPs for earnings' management. In Africa, banks use provisions to manage earnings, but this is more pronounced among listed banks (Ozili, 2017), and this declines after the use of IAS 19 (Abdul et al, 2016). Similar findings have been documented by Bryce et al (2015) in Vietnam, Packer et al (2014) in the Asian economies and El Sood (2012) in the US. Leventis et al (2012; 2011) show that earnings' management is more common among banks with high-risk appetite, but this behaviour declines after implementation of IFRS. In Netherlands, Norden and Stoian (2013) find that banks raise LLPs when revenue is high and scale down when regulatory capital is low. These studies, therefore, suggest that when bank's actual losses exceed the expected, they draw from loan loss reserves, hence reducing the volatility of incomes. On the contrary, Caporale et al (2018) do not find significant evidence of earnings' management in Italy. These studies, therefore, suggest that when the bank's actual losses exceed the expected, they draw from loan loss reserves, hence reducing the volatility of incomes. We, therefore, hypothesize that higher bank earnings are associated with higher LLPs.

Capital management

The second strand of literature examines the effect of capital management in influencing LLPs. Theoretical literature on capital management is scant. Nonetheless, this study infers from existing literature suggesting that banks manage capital to minimize perceived risk, as revenue volatility is a key risk indicator that attracts considerable investor attention (Beaver et al, 1970). Capital management hypothesis shows that to mitigate against asymmetry, the bid-ask spread by market markers edges up, especially when incomes are volatile (Affleck-Graves et al, 2002). Because of adverse selection, the cost of capital increases. Banks can also manipulate provisions to ensure compliance with minimum regulatory capital requirements. Managers reduce provisioning levels when regulatory capital levels are relatively low. This reduces provisioning procyclicality, as capitalization may decline during economic downturns (Ahmed et al, 1999). Put differently, since central banks require banks to maintain a certain minimum capital as a cushion against risk-taking behaviour, managers have an incentive to influence its level (Leventis et al, 2011). As such, provisions tend to be higher when a bank's capital is low. Thus, LLPs and capital are substitutes for potential losses. That notwithstanding, capital requirements are procyclical because a rise in non-performing loans during economic slowdown raises banks' risk exposure. An alternative proposition is provided by Kilic et al (2012) who

assert that in the absence of regulatory capital requirement, managers view provisions as bank capital. Thus, when capital is low, managers tend to overstate provisions to compensate for the inadequate capital.

Existing empirical literature remains inconclusive. Although some studies have established a positive impact of capital on risk (Lee and Hsieh, 2013), others have documented a negative relationship where banks raise their risk profile with a decline in capital (Guidara et al, 2013). The converse has also been established where banks increase LLPs when capital is inadequate (Kilic et al, 2012) or for the purpose of regulatory requirements (Leventis et al, 2011). The impact of capital on provisioning is therefore indeterminate.

Cyclicality of LLPs

The third strand of the literature is on the pro- or counter-cyclical nature of LLPs. If LLPs are procyclical, capital is negatively affected during periods of economic contraction. Counter-cyclical LLPs are higher during periods of economic boom. Procyclicality of LLPs is undesirable as it reflects an unstable financial system. Economic prosperity is characterized by improved conditions for borrowers due to lower credit risk premium. This may in turn enhance demand for loans since borrowers report more profit and are, therefore, more likely to repay their loans. However, due to increased competition for loans' market share among banks (new market entrants and existing banks), the likely outcome is relaxed credit screening and monitoring (Berger and Udell, 2004). Consequently, during economic downturn, the quality of loan portfolio deteriorates while at the same time credit risk rises (Ogura, 2006). An increase in LLPs during this period, therefore, reduces bank overall profit. It, therefore, becomes difficult to account for credit risk in the loan portfolio if provisions are enhanced due to incurred losses. Forward-looking provisions enable banks to build a buffer to mitigate cyclical peaks and troughs.

Empirical evidence remains mixed. For a panel of Italian banks, Caporale et al (2018) find that provisioning is less cyclical among domestic banks, since they are strongly affected by banking supervision. Ozili and Outa (2017) provide an excellent survey of literature on the pro- or counter-cyclicality of LLPs. They conclude that the evidence remains mixed. Using a sample of 554 banks from developing countries, Murcia and Kohlscheen (2016) conclude that provisions are procyclical. Olszak et al (2017) analyse the drivers of LLPs and find that provisions among large banks are procyclical with the business cycle. In the microfinance literature, Hessou et al (2019) show that LLPs and business cycles are negatively related. Bouvatier and Lepetit (2012) reveal that backward-looking LLPs tend to enhance the procyclicality of credit growth. Previous studies are, however, based on a single bank's performance indicator and small datasets. Although several cross-country studies have been documented, country-specific investigations are scant. We therefore predict an indeterminate relationship between loan loss provisioning and economic growth.

Risk-taking behaviour

The fourth strand in the literature evaluates how a bank's financial performance is affected by its risk-taking decisions. An efficient financial intermediation system channels surplus funds into investments through the creation of loan assets. In the process, credit risk is inevitable due to the borrower's inability to repay the principal and/or interest on loan due to unfavourable economic conditions. Microeconomics of banking theories show that credit risk and loan asset quality are closely linked. The financial intermediation framework in Diamond and Dybvig (1983) and industrial organization theories of banking, such as Monti-Klein framework, show that loan assets and credit risk are closely related. Credit expansion does not necessarily translate into higher NPLs, especially if the credit is extended to solvent firms with viable projects and a positive net present value. However, if during economic expansion, managers relax their lending standards so that insolvent firms receive credit, this would trigger higher defaults in the loans when the economic cycle is in a trough. The empirical evidence, however, remains inconclusive. Among Colombian banks, Amador et al (2013) established that higher credit expansion is positively associated with rising NPLs but negatively related to bank solvency. On a sample of developed economies, Foos et al (2010) established that credit expansion leads to higher LLPs in the subsequent three years.

Ownership structure

Whether a bank engages in earnings' management through LLPs largely depends on ownership concentration (Bouvatier et al, 2014). In Jordan, AlQudah et al (2020) examine the role played by different types of owners in constraining earnings' management. They conclude that foreign ownership concentration deters income smoothing behaviour. This is consistent with Alrabba et al (2018). In a study of Chinese banks, Meng et al (2018) established that foreign investors are more skilful in the appointment of board members, which constrains income smoothing behaviour. But on the contrary, Wu et al (2015) find that banks with higher concentration of foreign investors use LLPs for earnings' management in China. In the Malaysian context, foreign owners are very effective in obstructing income smoothing behaviour (Shayan-Nia et al, 2017; Al-Jaifi, 2017). The reviewed studies show that ownership concentration may increase or decrease the incentive to manipulate earnings.

These previous findings suggest that provisioning is used to achieve different objectives, which range from income smoothing, as compensation policy, a capital management technique and whether LLP is pro- or counter-cyclical. The evidence is however mixed. Provisioning behaviour of banks in some regional contexts such as the Kenyan banking industry remain unexplored. This study seeks to fill this gap.

4. Data and methodology

Model specification

We assume that banks set their LLPs target a priori and gradually adjust it based on the previous period realized loan loss. The empirical model follows closely Murcia and Kohlscheen (2016) and Dushku (2016). Provisioning behaviour follows a dynamic adjustment framework specified as follows:

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

Where $LLP_{i,t}$ is loan loss provision 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. $EBIT_{i,t}$ represents earnings before interest and taxes. $Size_{i,t}$ captures the size of the bank, $LIQ_{i,t}$ is the bank liquidity, and $LG_{i,t}$ is the loan growth. $AQ_{i,t}$ is asset quality and $AQ_{i,t-1}$ is the lagged asset quality. $rGDP$ is real GDP growth, and $Ownership_i$ is the structure of bank's ownership.

Adequate capital ensures a stable and resilient banking system. Banks use provisions to achieve regulatory capital requirements and to avoid the cost of non-compliance. As such, provisions tend to be higher when a bank's capital is low. Therefore, LLPs and capital are considered substitutes for potential losses (Bouvatier and Lepetit, 2012). Although some studies have established a positive association between capital and risk (Lee and Hsieh, 2013), others have documented a negative association (Guidara et al, 2013). The relationship between capital and LLPs is therefore indeterminate.

To test earnings management, we use $EBIT_{i,t}$. The hypothesis holds if the coefficient is positive, suggesting that banks with lower income than targeted reduce LLPs (Pool et al, 2015; Dushku, 2016). When losses exceed the targeted values, banks draw from LLPs, thereby reducing the volatility of incomes. We predict a positive relationship between bank earnings and LLPs.

Credit expansion $(LG_{i,t})$ does not necessarily translate into higher future NPLs. Loan expansion should be positively associated with LLPs if credit growth prompts banks to set aside LLPs (Leventis et al, 2011). Existing literature shows that higher

credit expansion is positively associated with rising non-performing loans, which has implications on LLPs (Amador et al, 2013; Foos et al, 2010). We expect a positive association between LLPs and loan growth.

Bank size controls for economies and diseconomies of scale. Due to the benefit that may accrue to the managers, large banks have more incentives to raise earnings (Lobo and Zhou, 2006). Moreover, large banks are under more pressure to meet analysts' expectations (Barton and Simko, 2002). Similarly, large banks have higher discretionary accruals (Chen et al, 2007) and diversified business activities and therefore can afford larger LLPs (Alves, 2012; Anandarajan et al, 2007). We therefore predict a positive relationship between size and LLPs.

Illiquid banks may turn to credit risk management tools to manipulate LLPs. Yang et al (2008) and Chen et al (2007) show that a bank's liquidity negatively influences discretionary accruals, which implies that liquid banks are less likely to manipulate LLPs. We therefore expect a negative relationship between LLPs and bank liquidity.

NPLs represent banks' risk profile and therefore controls for credit risk (Radivojevic and Jovovic, 2017). The variable accounts for non-discretionary component of the LLPs and build up LLPs during economic prosperity to be drawn during downturn. This is due to the fact that when banks issue more loans, the risk of loan default increases, which prompts banks to increase their LLPs (Othman and Mersni, 2014). We predict a positive association between changes in NPLs and LLPs.

Banks with local ownership concentration could use discretionary provisions for income smoothing to conceal private benefits (Bouvatier, 2014). Empirical evidence shows that the ability of managers to manipulate earnings through LLPs is constrained when the bank has more foreign investors (AlQudah et al, 2020; Meng et al, 2018). We therefore predict less LLPs manipulation in banks with higher foreign shareholding.

To test the pro- or counter-cyclicality of loan loss provisions, we include real GDP growth at constant prices. Loan loss provision is countercyclical if a bank's LLP is positively related to GDP growth (Frait and Komarkova, 2013; Bouvatier and Lepetit, 2012) or procyclical when negatively related (Hessou et al, 2019; Olszak et al, 2017). We therefore predict an indeterminate relationship. For robustness, we use credit-to-GDP growth (credit gap), which is expected to provide an early warning signal for an upcoming crisis. In this regard, loan loss provision will be countercyclical if positively related to the credit-to-GDP gap. Credit gap variable is robust and points to a build-up of financial vulnerabilities (Borio and Lowe, 2002). We also use output gap as a proxy for business cycle. The study also considers business climate variable to examine the role of business environment on LLPs.

Definition and measurement of variables

LLP is measured as the ratio of loan loss provisions to lagged total assets. The lagged LLP over lagged total assets is an autoregressive term capturing the adjustment costs. While LLPs could either be discretionary or non-discretionary, our dataset does not

allow us to disentangle LLPs into their respective components. Existing literature has proxied the non-discretionary component using indicators that represent current and previous losses in the loan portfolio (e.g. Bouvatier and Lepetit, 2008; Fonseca and Gonzàles, 2008). Further, whereas provisioning is ideally against the total loans, there is no consensus in the literature on the appropriate deflator. This study used the lagged assets deflator, which is appropriate as it takes into account the size of the bank pegged on future investments in assets (Ozili, 2017).

Asset quality (AQ) is the ratio of NPL to lagged total loans and captures a bank's overall credit risk exposure in its intermediation activities. Ownership, which is a bank's ownership structure, is measured in percentage terms; i.e. the proportion of foreign shareholding to the total shares of the bank. 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. $EBIT_{i,t}$ is the ratio of earnings before interest and taxes to total assets. If the α_3 coefficient is positive, this supports the proposition that LLPs are used for earnings' management.

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. Bank size is the natural logarithm of total assets for each bank. Bank liquidity (LIQ) is computed as the ratio of liquid assets to total assets.

Annual growth of GDP $(rGDP_t)$ at constant prices captures pro- or counter-cyclicality of LLPs. A negative coefficient supports procyclicality while a positive coefficient supports counter-cyclicality of loan loss provisions. Output gap (OUTGAP) is the cyclical component of real GDP growth, which is obtained by applying the Hodrick-Prescott (1997) filter. Cyclical output gap is more appropriate relative to real GDP growth, since it removes the time series trend. Credit gap is the deviation of credit to the private sector as a percentage of GDP from its long-term trend, which is also calculated using the time series filter suggested by Hodrick and Prescott (1997). There are, however, measurement problems associated with these two variables. First is the stability of the filter's outcome as more recent data becomes available. Second is the structural breaks associated with the underlying series. The estimated results should therefore be interpreted in light of this caveat. The business freedom score ranges from 0 to 100, with 100 indicating the most free business climate.

Data source

The analysis is based on hand-collected annual audited data of 38 banks (out of 43 banks - see Chapter 2) that spans the period 2002-2018. The data is obtained from the published balance sheet and income statement while macroeconomic data was obtained from the CBK. The choice of the study period was informed by data availability at the bank level. Table 2 presents definition and measurement of the variables, the predicted effects a priori based on theory and empirical literature, and sources of data.

Table 2: 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	-	
Capital ratio	$CAP_{i,t}$	Ratio of capital to risk-weighted assets	Capital management	+/-
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	-	+
Bank ownership	$Ownership_{i,t}$	Foreign shareholding of a bank as a share of the total outstanding shares	-	-/+
Real GDP annual growth rate	GDP_t	Real Gross Domestic Product annual growth rate	Cyclicality of LLPs	-/+
Output gap	$OUTGAP_t$	Deviation of GDP from its long-term trend	Cyclicality of LLPs	-/+
Credit-to-GDP growth gap	$Credit_t$	Deviation of credit to the private sector as a % of GDP from its long-term trend	Cyclicality of LLPs	-/+
Business freedom	BF	Ranges from 0 to 100 with 100 indicating the most free business climate.	Cyclicality of LLPs	-/+

Estimation and testing

The dynamic nature of Equation 2 makes OLS estimation inconsistent and biased upwards. This is because lagged LLP is correlated with the error term (Hsiao, 2014). The within-group (i.e. random effects) short-panel estimator is biased downwards (Nickell, 1981). We therefore turn to Generalized Methods of Moments (GMM) estimators. GMM estimation is designed to circumvent several econometric issues: (1) the autoregressive behaviour of loan loss provisions; (2) the unobserved bank-specific effects; and (3) the potential endogeneity of the regressors, which we control using lagged values as instruments. The standard Arellano and Bond (1991) estimator is poorly behaved as it suffers from downward finite-sample bias (Blundell and Bond, 2000). When applied to small T panels, this estimator has been criticized since it is inefficient if the instruments are weak (Baltagi, 2021). System GMM by Blundell and Bond (1998) enables us to use lagged differences and lagged levels. The extra

instruments and equations in levels renders system GMM more efficient, since it is able to overcome the weak instrument problem associated with the first-differenced GMM estimator. To determine the most appropriate estimator, we compare the coefficient of the lagged LLP obtained from the different estimators. We performed Hansen's or Sargan test of over-identifying restrictions to establish the validity of the instruments. We also confirm if Arellano-Bond orthogonality conditions hold.

5. Empirical findings and discussion

Table 3 presents summary statistics. The mean of loan loss provision stands at 9.1%, implying that banks set aside 9.1% 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 earnings before interest and taxes is 6.9%. The natural logarithm of total assets is 9.66 and the liquidity ratio is 38.4% while the average loan growth stands at 12.8%. The average non-performing portfolio is 17.2%.

For the study period, the average economic growth is 4.9%. The ownership structure reveals that 26.5% of shares are held by foreigners. When we further disaggregate LLPs by bank size and ownership, the summary statistics reveal that provisioning is heterogeneous, with large banks provisioning more than small banks by 6.7%. This is consistent with Figure 3 in the stylized facts section. Provisioning among pan-African banks is 2.5% lower than the rest of the banks (see Table A1 in the appendix).

Table 3: Descriptive statistics

Variable Name	Obs	Mean	Std. Dev.	Min	Max
Loan loss provision	646	0.091	0.167	0.001	1.677
Capital ratio	646	0.283	0.149	0.000	1.072
Earnings before interest and taxes	646	0.069	0.070	-0.119	1.020
Bank size	646	9.666	1.451	6.672	13.158
Liquidity ratio	646	0.384	0.136	0.033	0.777
Loan growth	646	0.128	0.227	-3.694	0.616
Asset quality	646	0.172	0.180	0.000	0.872
Ownership (% foreign ownership)	646	0.265	0.441	0.000	1.000
Real GDP annual growth	646	4.893	2.175	0.232	8.406
Output gap	646	4.947	0.772	2.900	5.628
Credit gap	646	0.246	1.603	-3.219	2.494
Business freedom	646	67.46	3.002	60.5	70.4

Table 3 presents summary statistics of both the systematic and idiosyncratic factors. A detailed description and measurement of the variables is provided in Table 2.

Table 4 presents the correlation matrix. Except for asset quality and lagged asset quality, the bivariate correlations are not high to warrant a series of separate regressions. The analysis has focused mainly on the relationship between LLP and explanatory variables. First, we observe that LLPs and the lag are positively and significantly correlated, implying that banks adjust their provisions slowly, consistent with the past default history. Provisions are positively correlated with earnings before interest and taxes. This implies that banks that are unable to meet their projected revenue reduce provisions, which supports income-smoothing hypothesis. Provisions are negatively correlated with capital ratio, suggesting that when capital is low banks raise provisions, which points to capital management hypothesis.

Provisions and loan growth are positively correlated, which suggests that loan expansions trigger banks to raise provisions. The significant positive correlation between bank size and provisions suggests that large banks have higher loan growth rates and, therefore, set aside higher provision. Asset quality and asset quality lag are positive and significantly associated with provisions. Intuitively, higher NPLs prompt banks to set aside higher LLPs. Finally, economic growth is positively and significantly correlated with provisioning, an indication of the countercyclical nature of provisioning behaviour. Overall, the correlations between all the other variables are low, hence no risk of multicollinearity.

To determine the suitability of the standard or system GMM estimator, we compared the coefficient of the lagged LLP obtained from the different estimators. System GMM yields a higher coefficient than the standard GMM estimator. We therefore estimate Equation 1 using the one-step system GMM. To control for time effects, we do not use time dummies, as their inclusion would net out the cyclical properties that the macroeconomic variables are meant to test. In addition, the bank and macroeconomic factors are treated as strictly exogenous. Whether they should be treated as exogenous or endogenous factors remains inconclusive in the literature (Skala, 2015). The study adopts the "collapse option" and the finite sample correction approach of Windmeijer (2005). The system GMM method employed fits well with the data. The lagged LLP is restricted to a maximum lag of three to avoid instrument proliferation (Roodman, 2009) and one lag for the other bank-level characteristics.

Table 5 presents estimation results. Study findings reveal that provisions adjust partially with the degree of inertia at 25.3%. Thus, the speed of adjustment to the optimal target is fast. Study findings further reveal that provisions are higher when capital is low and vice versa, which supports the view that managers use provisions for capital management. This finding is contrary to Lee and Hsieh (2013).

Table 4: Pearson correlation matrix

Variables	LLP	lag LLP	CAP	EBIT	SIZE	LIQ	LG	AQ	lag AQ	Ownership	GDP	OUTGap	Credit	BF
LLP	1													
Lag LLP	0.9010*	1												
CAP	-0.1060*	-0.05	1											
EBIT	0.0960*	0.0923*	-0.0004	1										
SIZE	0.2656*	0.2820*	-0.3274*	-0.0564	1									
LIQ	-0.2664*	-0.2390*	0.3239*	-0.0238	-0.0331	1								
LG	0.1101*	0.3159*	0.1311*	0.0315	0.0589	-0.0775	1							
AQ	0.6301*	0.6200*	0.0574	-0.1031*	-0.4134*	-0.2913*	-0.1255*	1						
lag AQ	0.5828*	0.7121*	0.0997*	-0.1077*	-0.4416*	-0.2489*	-0.2369*	0.8743*	1					
Ownership	-0.2186*	-0.2292*	0.0868*	-0.0634	0.1899*	0.5562*	-0.0052	-0.2359*	-0.2361*	1				
GDP	0.0859*	-0.04	-0.0391	-0.0041	0.1972*	0.0414	0.0288	-0.1931*	-0.0981*	-0.003	1			
OUTGap	0.2020*	-0.2239*	-0.0694	0.0055	0.4327*	-0.0034	0.0915*	-0.4064*	-0.4113*	0.0004	0.6616*	1		
Credit	0.03	-0.03	0.0358	0.0255	0.0166	-0.0083	0.0683	0.0682	0.002	-0.0009	0.0685	-0.1274*	1	
BF	0.0070	0.0370	0.0330	0.1670	0.0500	0.0990	0.1200	0.0190	0.0270	0.0320	0.1490*	0.1680*	0.0340	1

A detailed description and measurement of the variables is provided in Table 2. * Coefficients are statistically significant at the 5% level.

The coefficient for earnings before interest and tax is positive and statistically significant, which suggests that 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. This lends support to Dushku (2016). Estimation results shows that large banks set aside higher LLPs than smaller banks, which is consistent with correlation matrix and the stylized facts (see Figure 3) where on average large banks set aside higher provisions. Therefore, LLPs are higher in large banks due to the scale of intermediation (Anandarajan et al, 2003). Study findings further reveal a positive association between loan growth and LLPs, suggesting that credit expansion may prompt banks to raise LLPs (Leventis et al, 2011). The interaction term between bank size and loan growth is positive. Thus, an extra unit of loan growth translates to higher provisioning in large banks relative to small banks. This suggests that large banks grow their loan portfolios better than small banks, which necessitates higher provisioning.

Higher NPLs are associated with higher provisions, which points to prudent risk management by bank managers. This is also consistent with accounting requirements for higher provisions as asset quality deteriorates. This finding lends credence to Othman and Mersni (2014). However, the previous levels of non-performing loans are not significant in influencing the level of provisioning. The hypothesis that banks with higher liquidity are associated with lower provisions is not supported here.

Contrary to AlQudah et al (2020) and Meng et al (2018), estimation results reveal that higher foreign shareholding translates into higher provisions. Therefore, foreign ownership concentration is not effective in constraining income smoothing behaviour. This finding is, however, consistent with Wu et al (2015) in China. Higher economic growth enhances LLPs, suggesting a counter-cyclicality in provisioning. LLPs are therefore higher during periods of economic boom, which later acts as a cushion during periods of economic contraction (Frait and Komarkova, 2013).

This study also analysed the sensitivity of the estimates to the inclusion of alternative indicators of economic cycle, namely credit gap, output gap, business climate and the 2008-2009 global financial crisis. Estimation results reveal significant variation in the provisioning behaviour during financial crisis. Thus, the crisis may have triggered higher LLPs where banks provisioned more during the crisis. Study findings further reveal that output gap significantly influences bank provisioning. This suggests that banks raise provisions during economic expansion and reduce during economic contraction. Credit gap is, however, not significant. Estimation results further reveal that business climate does not matter for provisioning, perhaps due to low variability of data.

Table 5. Estimation results for loan loss provisions

Variable Name	Notation	(1)	(2)
		System GMM	System GMM
Constant	*Con*	-0.241***	-0.237***
		(-4.08)	(-3.44)
Lagged loan loss provision	$LLP_{i,t-1}$	0.749***	0.735***
		(3.44)	(3.41)
Capital	$CAP_{i,t}$	-0.089***	-0.084***
		(-3.01)	(-3.06)
Earnings before interest and taxes	$EBIT_{i,t}$	0.036***	0.034***
		(3.10)	(2.99)
Size	$SIZE_{i,t}$	0.019**	0.018***
		(2.74)	(2.81)
Liquidity	$LIQ_{i,t}$	-0.008	-0.010
		(-0.19)	(-0.18)
Loan growth	$LG_{i,t}$	0.147***	0.051
		(3.48)	(0.29)
Asset quality	$AQ_{i,t}$	0.244**	0.249**
		(2.19)	(2.25)
Lagged asset quality	$AQ_{i,t-1}$	-0.002	-0.002
		(-0.85)	(-0.87)
Foreign shareholding (%)	$Ownership_{i,t}$	0.026**	0.029**
		(2.34)	(2.38)
Loan growth X bank size	$LG_{i,t}.\ SIZE_{i,t}$		0.019**
			(2.21)
Real GDP growth	GDP_t	0.029**	0.027**
		(2.63)	(2.61)
Output gap	OUTGAP	0.049**	0.029**
		(2.50)	(2.40)
Credit gap	CREDIT	0.001	0.003
		(0.86)	(0.94)
Business freedom	BF	-0.001	-0.003
		(-0.39	(-0.43
GFC Crisis (=1 2008-2009, 0 otherwise)	$Crisis_t$		0.017**
			(2.50)

continued next page

Table 5 Continnued

Variable Name	Notation	(1)	(2)
		System GMM	System GMM
Number of banks		38	38
Number of Instruments		15	16
AR (1) (P-values)		0.000	0.000
AR (2) (P-values)		0.410	0.370
Sargan Test		0.401	0.413
Hansen Test		0.697	0.704

Table 5 presents one-step system GMM estimation using Windmeijer's (2005) finite sample correction regression. T-Statistics are in parentheses and the level of significance at 10%, 5%, and 1% is denoted by *, ** and *** respectively. A detailed description and measurement of the variables is provided in Table 2.

Robustness checks

For robustness, we implement a battery of models to test for heterogeneity among the banks as reflected by bank size and ownership status. We, therefore, examined provisioning behaviour on large versus small banks, pan-African versus the rest of the banks. For estimation, bank size is split into two subgroups: small and large banks. The large-small bank dichotomy is constructed based on the median bank size (with size measured as the total assets of the bank). A bank whose total assets is below the median size is considered small. The estimation results are reported in Table 6. Overall, the study findings are similar to those reported in Table 5. However, several novel findings emerge. Unlike large banks, small banks do not use LLPs for capital or earnings' management. Loan growth is significant and positive but only in large banks. This suggests that higher loan growth is associated with higher provisioning among large banks, which confirms the results in Table 5.

Higher NPLs is associated with higher provisions, but the magnitude is higher among smaller banks. This finding is consistent with Figure 2 (stylized facts). It is the same narrative with ownership. Pan-African banks do not use LLPs for capital or earnings' management. Although bank size significantly influences provisioning behaviour among domestic banks, it does not matter for pan-Africa banks. Descriptive statistics (Table A1 in the Appendix) show that pan-Africa banks are, on average, small with less credit expansion and lower LLPs. Contrary to most countries in Africa, the banking sector in Kenya is dominated by indigenous banks, some of which have extended into several countries. This perhaps explains the insignificant loan growth coefficient. Finally, we find support for the provision's counter-cyclicality, which is more pronounced among the small and non-pan-African banks. This is contrary to Caporale et al (2018) who finds provisioning to be less cyclical among domestic banks. Procyclicality among pan-African banks is not supported by the study findings.

Table 6: The sensitivity of loan loss provisioning behaviour to bank size and ownership status

Variable Name	Notation	(1)	(2)	(3)	(4)
		Small Banks	Large Banks	Pan-African Banks	Non-Pan-African Banks
Constant	*Con*	-0.252	-0.112***	-0.033	-0.254***
		(-0.77)	(-2.84)	(-0.24)	(-3.64)
Lagged loan loss provision	$LLP_{i,t-1}$	0.574	0.921***	0.401	0.722***
		(1.51)	(9.49)	(2.23)	(3.33)
Capital	$CAP_{i,t}$	-0.070	-0.071***	-0.023	-0.085**
		(-1.16)	(-3.15)	(-0.65)	(-2.62)
Earnings before interest and taxes	$EBIT_{i,t}$	0.055	0.021**	0.013	0.035***
		(1.16)	(2.10)	(0.94)	(2.74)
Bank size	$SIZE_{i,t}$			0.015	0.019**
				(1.25)	(2.31)
Liquidity ratio	$LIQ_{i,t}$	-0.044	0.017	0.037	-0.024
		(-0.51)	(0.81)	(0.61)	(-0.36)
Loan growth	$LG_{i,t}$	0.087	0.150***	0.055	0.138***
		(1.10)	(4.38)	(0.76)	(3.17)
Asset quality	$AQ_{i,t}$	0.288*	0.135*	0.225**	0.268**
		(1.92)	(1.76)	(5.01)	(2.24)
Lagged asset quality	$AQ_{i,t-1}$	-0.001	-0.015	-0.006	-0.001
		(-0.97)	(-1.63)	(-1.56)	(-0.81)
Real GDP growth rate	GDP_t	0.035***	0.010***	-0.008	0.026**
		(2.98)	(3.90)	(-0.98)	(2.49)
Foreign shareholding (%)	$Ownership_{i,t}$	0.049**	0.019**		
		(2.16)	(2.25)		
Number of observations		510	136	68	578
Number of banks		30	8	4	34
Number of instruments		11	11	11	11
AR (1) (P-values)		0.010	0.010	0.012	0.000
AR (2) (P-values)		0.310	0.297	0.243	0.550
Sargan Test		0.610	0.410	0.311	0.388
Hansen Test		0.252	0.363	1.000	0.694

Table 6 presents one-step system GMM estimation using Windmeijer's (2005) finite sample correction regression. T-Statistics are in parentheses and the level of significance at 10%, 5%, and 1% is denoted by *, ** and *** respectively. A detailed description and measurement of the variables is provided in Table 2.

6. Conclusions

Existing literature shows that excessive credit growth is particularly prevalent in developing countries. At the onset, this study sought to uncover the determinants of LLPs in Kenya for the period 2002–2018. To achieve this objective, the study used the system GMM estimator. Overall, we find evidence that; (i) banks use provisions for capital management purposes, but this finding is sensitive to bank size and ownership status; (ii) earnings management influences provisioning decisions but this is also sensitive to bank size. Unlike small banks, large banks use provisions to smoothen income; (iii) higher foreign shareholding of banks is positively associated with higher provisions; (iv) provisions reflect variations in the quality of assets; (v) provisioning is counter-cyclical, but this is more pronounced among small and domestic banks; (vi) more importantly, pan-African banks do not use LLPs for capital or earnings' management.

These study findings have important policy implications for banks supervision in Kenya. First, considerable heterogeneity in the discretionary use of provisions by banks in the application of the incurred loss model of IAS 39 implies that even post-transition to the expected loan loss model as envisaged by IFRS 9, a significant deal of discretion exists. 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 income smoothing and capital management. For example, the policy debate is about whether the benefits of income smoothing outweigh costs (Goel and Thakor, 2003). That notwithstanding, income smoothing lowers the quality of accounting data. The empirical evidence uncovered in this paper points to the need for a sound accounting framework.

Notes

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

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

References

Abdul A.A., D.W. Tripe, and P. Dunmore. 2016. “IAS 39, income smoothing, and procyclicality: Evidence from Hong Kong banks”. *Journal of Financial Economic Policy*, 8(1): 80–94.

Acar, M. and M.O. Ipci. 2015. “Loan loss provisions and income-smoothing hypothesis: Experience from the Turkish banking sector”. *Journal of Accounting*, 5(1): 118–135.

Affleck-Graves, J., C. Callahan and N. Chipalkatti. 2002. "Earnings predictability, information asymmetry, and market liquidity." *Journal of Accounting Research,* 40:561–83.

Ahmed, A., C. Takeda and S. Thomas. 1999. “Bank loan loss provisions: A re-examination of capital management, earnings management and signalling effects”. *Journal of Accounting and Economics,* 28:1–25.

Al-Jaifi, H.A. 2017. “Ownership concentration, earnings management and stock market liquidity: Evidence from Malaysia”. *Corporate Governance: The International Journal of Business in Society,* 17(3): 490–510.

AlQudah, A.M., M.J. Azzam, A.A. Haija and S.A. AlSmadi. 2020. "The role of ownership map in constraining discretionary loan loss-provisions decisions in Jordanian banks”. *Cogent Business and Management*, 7(1): 1752604.

Alrabba, H.M., A.A. Haija, A.M. AlQudah and M.J. Azzam. 2018. "The mediating role of foreign ownership in the relationship between board characteristics and voluntary disclosures of Jordanian banks”. *Academy of Accounting and Financial Studies Journal*, 22(16): 1–15.

Alves, S. 2012. “Ownership structure and earnings management: Evidence from Portugal”. *Australasian Accounting, Business and Finance Journal,* 6(1): 57–74.

Amador, J., J. Gómez-Gonzalez and A. Murcia. 2013. “Loan growth and bank risk: New evidence”. *Financial Markets and Portfolio Management*, 27, 365–79.

Amihud, Y., and B. Lev. 1981. “Risk reduction as a managerial motive for conglomerate mergers”. *Bell Journal of Economics*, 12: 605–617.

Anandarajan, A., I. Hasan and C. McCarthy. 2007. “Use of loan loss provisions for capital, earnings management and signalling by Australian banks”. *Accounting and Finance*, 47(3): 357–379.

Anandarajan, A., I. Hasan and A. Lozano-Vivas. 2003. “The role of loan loss provisions in earnings management, capital management, and signaling: The Spanish experience”. *Advances in International Accounting,* 16: 45–65.

Andries, K., J. Gallemore and M. Jacob. 2017. “The effect of corporate taxation on bank transparency: Evidence from loan loss provisions”. *Journal of Accounting and Economics*, 63(2-3): 307–328.

Arellano, M. and S. Bond. 1991. "Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations". *The Review of Economic Studies*, 58(2): 277–297.

Atellu, A.R., P. Muriu and O. Sule. 2021. "Do bank regulations matter for financial stability? Evidence from a developing economy". *Journal of Financial Regulation and Compliance*.

Baltagi, H. 2021. *Econometric analysis of panel data*, 6th Ed. London: John Wiley and Sons.

Barton, J. and P. Simko. 2002. "The balance sheet as an earnings management constraint". *The Accounting Review,* 77(Supplement): 1–27.

Beaver, W., P. Kettler and M. Scholes. 1970. "The association between market determined and accounting determined risk measures". *The Accounting Review*, 45(4): 654–682.

Beck, T., M. Fuchs, D. Singer and M. Witte. 2014. *Making cross-border banking work for Africa.* Technical report. Washington DC: World Bank.

Berger, A.N. and G.F. Udell. 2004. "The institutional memory hypothesis and the procyclicality of bank lending behaviour". *Journal of Financial Intermediation*, 13(4): 458–495.

Betancourt, L. and C.P. Baril. 2009. "Accounting for loan losses: Is dynamic provisioning the answer?" *Bank Accounting Finance*, 22(6): 9–16.

Blundell, R. and S. Bond. 1998. "Initial conditions and moment restrictions in dynamic panel data models". *Journal of Econometrics*, 87(1): 115–143.

Blundell, R. and S. Bond. 2000. "GMM estimation with persistent panel data: An application to production functions". *Econometric Reviews*, 19(3): 321–340.

Borio, C. and P. Lowe. 2002. "Assessing the risk of banking crises". *BIS Quarterly Review*, 43–54.

Bouvatier, V. and L. Lepetit. 2008. "Banks' procyclical behaviour: Does provisioning matter?" *Journal of International Financial Markets, Institutions and Money,* 18(5): 513–526.

Bouvatier, V. and L. Lepetit. 2012. "Provisioning rules and bank lending: A theoretical model". *Journal of Financial Stability*, 8(2): 25–31.

Bouvatier, V., L. Lepetit and F. Strobel. 2014. "Bank income smoothing, ownership concentration and the regulatory environment". *Journal of Banking and Finance*, 41: 253–270.

Bremus, F. M. 2015. "Cross-border banking, bank market structures and market power: Theory and cross-country evidence". *Journal of Banking and Finance*, 50: 242–259.

Bryce, C., A. Dadoukis, M. Hall, L. Nguyen and R. Simper. 2015. "An analysis of loan loss provisioning behaviour in Vietnamese banking". *Finance Research Letters,* 14: 69–75.

Caporale, G.M., M. Alessi, S. Di Colli and J.S. Lopez. 2018. "Loan loss provisions and macroeconomic shocks: Some empirical evidence for Italian banks during the crisis". *Finance Research Letters*, 25: 239–243.

Central Bank of Kenya (Various). *Annual Bank Supervision Reports.* Nairobi: Central Bank of Kenya.

Chen, K.Y., R.J Elder and Y.M. Hsieh. 2007. "Corporate governance and earnings management: The implications of corporate governance best-practice principles for Taiwanese listed companies". *Journal of Contemporary Accounting and Economics*, 3(2): 73–105.

Degeorge, F.J.P. and F.Z. Richard. 1999. "Earnings management to exceed thresholds". *Journal of Business*, 72: 1–34.

Diamond, D.W. and P.H. Dybvig. 1983. "Bank runs, deposit insurance, and liquidity". *Journal of Political Economy*, 91(3): 401–419.

Drehmann, M., S. Sorensen and M. Stringa. 2010. "The integrated impact of credit and interest rate risk on banks: A dynamic framework and stress testing application". *Journal of Banking and Finance,* 34(4): 713–729.

Dushku, E. 2016. "Some empirical evidence of loan loss provisions for Albanian banks". *Journal of Central Banking Theory and Practice*, 5(2): 157–173.

Dye, R.A. 1988. "Earnings management in an overlapping generations model". *Journal of Accounting Research*, 26: 195–235.

El Sood, H.A. 2012. "Loan loss provisioning and income smoothing in US banks pre- and post the financial crisis". *International Review of Financial Analysis*, 25: 64–72.

Fonseca, A.R. and F. Gonzàlez. 2008. "Cross-country determinants of bank income smoothing by managing loan-loss provisions". *Journal of Banking and Finance*, 32(2): 217–228.

Foos, D., L. Norden and M. Weber. 2010. "Loan growth and riskiness of banks". *Journal of Banking and Finance*, 34: 2929–40.

Frait, J. and Z. Komarkova. 2013. "Loan loss provisioning in selected European banking sectors: Do banks really behave in a procyclical way? *Finance a Uver,* 63(4): 308.

Goel, A. and A. Thakor. 2003. "Why do firms smooth earnings? *Journal of Business,* 76(1): 151–192.

Guidara, A., V.S. Lai, I. Soumaré and F.T. Tchana. 2013. "Banks' capital buffer, risk and performance in the Canadian banking system: Impact of business cycles and regulatory changes". *Journal of Banking and Finance*, 37(9): 3373–3387.

Hessou, H.T., R. Lensink, I. Soumaré and H.T. Tchuigoua. 2019. "What drives provisioning behaviour in microfinance institutions?" Working Paper, Kedge Business School.

Hodrick, R. and E. Prescott. 1997. "Post-war US business cycles: An empirical investigation". *Journal of Money, Credit and Banking*, 29 (1): 1–16.

Hsiao, C. 2014. *Analysis of panel data* (No. 54). Cambridge University Press.

Kilic, E., G.J. Lobo, T. Ranasinghe and K. Sivaramakrishnan. 2012. "The impact of SFAS 133 on income smoothing by banks through loan loss provisions". *The Accounting Review*, 88(1): 233–260.

Koch, T.W. and L.D. Wall. 2000. "The use of accruals to manage reported earnings: Theory and evidence." FRB Atlanta Working Paper 2000-23, Federal Reserve Bank of Atlanta.

Laeven, L. and G. Majnoni. 2003. "Loan loss provisioning and economic slowdowns: Too much, too late?" *Journal of Financial Intermediation*, 12(2): 178–197.

Lee, C.C. and M.F. Hsieh. 2013. "The impact of bank capital on profitability and risk in Asian banking". *Journal of International Money and Finance,* 32, 251–281.

Léon, F. 2016. "Does the expansion of regional cross-border banks affect competition in Africa? Indirect Evidence". *Research in International Business and Finance,* 37: 66–77.

Leventis, S., P.E. Dimitropoulos and A. Anandarajan. 2012. "Signalling by banks using loan loss provisions: The case of the European Union". *Journal of Economic Studies*, 39(5): 604–618.

Leventis, S., P.E. Dimitropoulos and A. Anandarajan. 2011. "Loan loss provisions, earnings management and capital management under IFRS: The case of EU commercial banks". *Journal of Financial Services Research*, 40: 103–122.

G. J. Lobo and J. Zhou, 2006. "Did Conservation Financial Reporting Increase after the Sarbanes-Oxley Act." *Accounting Horizons*, 20(1): 57-74. doi:10.2308/acch.2006.20.1.57.

Meng, Y., M.P. Clements, and C. Padgett. 2018. “Independent directors, information costs and foreign ownership in Chinese companies”. *Journal of International Financial Markets, Institutions and Money*, 53(1): 139–157.

Murcia, A. and E. Kohlscheen. 2016. "Moving in tandem: Bank provisioning in emerging market economies." Bank for International Settlements, Monetary and Economic Department.

Mwega, F.M. 2014. "Financial regulation in Kenya: Balancing inclusive growth with financial stability." Overseas Development Institute, Working Paper 407.

Ng, J., W. Saffar and J.J. Zhang. 2020. “Policy uncertainty and loan loss provisions in the banking industry”. *Review of Accounting Studies*, 25: 726–777.

Nickell, S. 1981. “Biases in dynamic models with fixed effects”. *Econometrica*, 49 (6): 1417–1426.

Norden, L. and A. Stoian. 2013. "Bank earnings management through loan loss provisions: A double-edged sword?" DNB Working Paper No. 404.

Ogura, Y. 2006. “Learning from a rival bank and lending boom”. *Journal of Financial Intermediation*, 15: 535–555.

Olszak, M., M. Pipien, I. Kowalska and S. Roszkowska. 2017. “What drives heterogeneity of cyclicality of loan loss provisions in the EU?” *Journal of Financial Services Research*, 51(1): 55–96.

Othman, B.K. and H. Mersni. 2014. “The use of discretionary loan loss provisions by Islamic banks and conventional banks in the Middle East region: A comparative study”. *Studies in Economics and Finance*, 31(1): 106–128.

Ozili, P.K. and E. Outa. 2017. “Bank loan loss provisions research: A review”. *Borsa Istanbul Review*, 17(3): 144–163.

Ozili, P.K. 2017. “Discretionary provisioning practices among Western European banks”. *Journal of Financial Economic Policy*, 9(1): 109–118.

Packer, F. and H. Zhu. 2012. "Loan loss provisioning practices of Asian banks." Bank for International Settlements, Monetary and Economic Department.

Packer, F., J. Shek and H. Zhu. 2014. “Counter-cyclical loan loss provisions in Asia." *SEACEN Financial Stability Journal*, 3: 25–58.

Pérez D., V. Salas-Fumás and J. Saurina. 2008. “Earnings and capital management in alternative loan loss provision regulatory regimes”. *European Accounting Review*, 17: 423–445.

Pool, S., L. De Haan and J.P. Jacobs. 2015. “Loan loss provisioning, bank credit and the real economy”. *Journal of Macroeconomics*, 45: 124–136.

Quagliariello, M. 2007. “Banks' riskiness over the business cycle: A panel analysis on Italian intermediaries”. *Applied Financial Economics*, 17, 119–138.

Radivojevic, N. and J. Jovovic. 2017. "Examining of Determinants of Non-Performing Loans." *Prague Economic Papers*, 26 (3), 300–316

Roodman, D. 2009. “How to do Xtabond2: An introduction to difference and system GMM in Stata”. *Stata Journal*, 9(1): 86–136.

Shayan-Nia, M., P. Sinnadurai, Z. Mohd-Sanusi, Z. and A.N.A. Hermawan. 2017. “How efficient ownership structure monitors income manipulation? Evidence of real earnings management among Malaysian firms”. *Research in International Business and Finance*, 41(1): 54–66.

Skała, D. 2015. “Saving on a rainy day? Income smoothing and procyclicality of loan-loss provisions in Central European banks”. *International Finance*, 18(1): 25–46.

Upadhyaya, R. 2017. "The political economy of Basel adoption in Kenya: A case of alignment of donor, government and banking sector interests." GEG Working Paper No. 131. University of Oxford.

Windmeijer, F. 2005. “A finite sample correction for the variance of linear efficient two-step GMM estimators”. *Journal of Econometrics,* 126(1): 25–51.

Wu, M.W., C.H. Shen and C.H. Lu. 2015. “Do more foreign strategic investors and more directors improve the earnings smoothing? The case of China”. *International Review of Economics and Finance*, 36: 3–16.

Yang, C.Y., H.N. Lai and B.L. Tan. 2008. “Managerial ownership structure and earnings management”. *Journal of Financial Reporting and Accounting,* 6(1): 35–53.

Appendix

Table A1: Descriptive statistics by bank size and ownership

Panel A: Summary statistics of small banks					
Variable name	**N**	**Mean**	**Std. Dev.**	**Min**	**Max**
Loan loss provision	510	0.058	0.140	0.002	1.123
Capital ratio	510	0.329	0.174	0.000	0.942
Earnings before interest and taxes	510	0.070	0.095	-0.119	1.020
Bank size	510	8.451	0.628	6.672	9.406
Liquidity ratio	510	0.394	0.147	0.099	0.777
Loan growth	510	0.117	0.180	-0.892	0.572
Asset quality	510	0.234	0.200	0.000	0.872
Notes: There are 30 small banks based on the median bank size					
Panel B: Summary statistics of large banks					
Variable name	**N**	**Mean**	**Std. Dev.**	**Min**	**Max**
Loan loss provision	136	0.124	0.184	0.001	1.677
Capital ratio	136	0.238	0.101	0.003	1.072
Earnings before interest and taxes	136	0.067	0.026	-0.046	0.129
Bank size	136	10.860	0.951	9.415	13.158
Liquidity ratio	136	0.374	0.124	0.033	0.717
Loan growth	136	0.139	0.266	-3.694	0.616
Asset quality	136	0.111	0.131	0.000	0.807
Notes: There are eight large banks based on the median bank size					
Panel C: Summary statistics of pan-African banks					
Variable name	**N**	**Mean**	**Std. Dev.**	**Min**	**Max**
Loan loss provision	68	0.069	0.063	0.003	0.214
Capital ratio	68	0.257	0.148	0.107	1.072
Earnings before interest and taxes	68	0.051	0.026	-0.027	0.104
Bank size	68	9.549	1.406	6.672	12.775
Liquidity ratio	68	0.354	0.062	0.240	0.502
Loan growth	68	0.140	0.175	-0.463	0.497
Asset quality	68	0.195	0.183	0.015	0.618
Notes: There are four pan-African banks based on the median bank size					

Table A1 Continued

Panel D: Summary statistics of non-pan African banks					
Variable name	**N**	**Mean**	**Std. Dev.**	**Min**	**Max**
Loan loss provision	578	0.093	0.175	0.001	1.677
Capital ratio	578	0.286	0.149	0.000	0.942
Earnings before interest and taxes	578	0.071	0.073	-0.119	1.020
Bank size	578	10.655	1.458	7.872	13.158
Liquidity ratio	578	0.387	0.142	0.033	0.777
Loan growth	578	0.161	0.232	-3.694	0.616
Asset quality	578	0.170	0.179	0.000	0.872
Notes: There are 34 non-pan African banks based on the median bank size					

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To strengthen local capacity for conducting independent, rigorous inquiry into the problems facing the management of economies in sub-Saharan Africa.

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