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Big 4 auditors, bank earnings management and financial crisis in Africa

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Abstract

This paper examines whether African banks audited by a Big 4 auditor use loan loss provisions for earnings management purposes before, during and after the global financial crisis. It focuses on income smoothing as a type of earnings management. Using bank data from 21 African countries from 2002 to 2014, the results show that African banks audited by a Big 4 auditor use loan loss provisions to smooth income and the incentive to smooth income is greater during recessionary periods. Also, African banks audited by a Big 4 auditor use income smoothing to lower high earnings during the financial crisis and in the pre-financial crisis period but not in the post-financial crisis period.

Keywords: Loan loss provision, banks, audit quality, Big 4 auditor, income smoothing, financial crisis, earnings management, economic cycles, recession, earnings smoothing

JEL: G21, G28, M41, M42

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1. Introduction

I examine whether African banks audited by a Big 4 auditor use loan loss provisions for earnings management purposes before, during and after the global financial crisis. The study focus on income smoothing as a type of earnings management.

Income smoothing involves reducing the variability of earnings so that reported earnings are never too high or too low (Liu and Ryan, 2006; Ozili and Outa, 2017). Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers (Schipper, 1989; Healy and Wahlen, 1999). Early studies show that firms manage reported earnings for several reasons. Firm can manage earnings to avoid debt covenant violation, to meet earnings forecast or for political cost reasons (Key, 1997; Jaggi and Lee, 2002; DeFond and Jiambalvo, 1994; Holthausen et al, 1995).

Income smoothing, which is a type of earnings management, generally has two effects. On one hand, income smoothing distorts the transparency of reported earnings and make earnings opaque. On the other hand, income smoothing helps firms to remain stable in bad times, and income smoothing has positive benefits for firms in heavily regulated industries such as banks (see Kanagaretnam et al, 2003; El Sood, 2012; Liu and Ryan, 2006; Ozili and Outa, 2018; Ozili, 2021).

Loan loss provision (LLP) is the most important accrual in banks (Ozili and Outa, 2017). LLPs are primarily used to mitigate expected loan losses but may be used for income smoothing, signaling and regulatory capital management purposes (see Bushman and William, 2012; Curcio and Hasan, 2015; Ozili and Arun, 2018). Understanding how bank income smoothing using LLP is influenced by auditor quality is important because bank managers can use their discretion in loan loss provisioning to alter the level of reported earnings to meet some desired outcome, and this behavior distorts the reliability of reported earnings, thereby misleading investors. Hiring the services of a Big 4 auditor may increase the quality of banks' earnings because, arguably, Big 4 auditors can provide additional monitoring to ensure that banks' reported earnings reflect the true underlying economic reality.

Big 4 auditors face two conflicting incentives. One, Big 4 auditors that want to penetrate the market for audit services will have incentives to lower their monitoring standards in order to penetrate the local market for audit services (Ozili, 2017b). On the other hand, Big 4 auditors that want to protect their reputation will increase their monitoring standards to discourage opportunistic manipulation of accounting numbers in the firms they audit (Lin and Hwang, 2010; Rusmin, 2010). However, the choice of whether the former or latter is the major concern of a Big 4 auditor at a particular time depends on other economic considerations such as audit fees, crisis

periods and other client-specific considerations such as client's profitability characteristics. So far, the direct impact of Big 4 auditors on earnings management in African banks has received little attention in the literature, and the impact of Big-4 auditors on bank income smoothing during financial crises particularly in Africa has not been studied.

The only existing study that is related to the present study is Ozili (2017b). The present study differs from Ozili (2017b) in the following ways. One, I test whether loan loss provisions are used to smooth high earnings, normal earnings or negative earnings in African banks. Ozili (2017b) did not perform this analysis. Secondly, I undertake a pre-crisis, during-crisis and post-crisis analyses in relation to the global financial crisis. Ozili (2017b) did not perform this analysis. Thirdly, the model used in the present study is specified differently from the model used in Ozili (2017b). The model used in the present study incorporates only the most commonly used theoretical LLP determinants in the literature to ensure that the model is properly specified.

Using a sample of 249 African banks audited by a Big 4 auditor from 2002 to 2014, the results show that African banks audited by a Big 4 auditor use loan loss provisions to smooth income and the incentive to smooth income is stronger during recessionary times. Also, income smoothing is used to lower high earnings during the financial crisis and in the pre-financial crisis period but not in the post-financial crisis period.

The present study makes two important contributions to the literature. First, it contributes to the audit quality literature. Prior studies showed that audit quality has a significant positive effect on earnings quality (Francis et al., 1999; Rusmin, 2010; Persakis and Iatridis, 2016; Alzoubi, 2016). The present study complements these studies by showing that audit quality reduces the extent of income smoothing under certain economic conditions. Secondly, this study contributes to the banking literature that investigate the determinants of income smoothing using LLPs among banks (see DeBoskey and Jiang, 2012; Kanagaretnam et al, 2010; Bouvatier et al, 2014; Ozili, 2017b; Ozili, 2020). These studies show that bank-specific incentives, institutional factors and economic factors are determinants of bank income smoothing. The present study adds to this literature by showing that audit quality is another determinant of bank income smoothing especially in the African context.

The remainder of the paper is organized as follows. Section 2 presents the literature review. Section 3 presents the empirical design including the data and methodology. Section 4 discusses the results. Finally, section 5 concludes and provides implications.

2. Literature review and hypotheses development

2.1. Theory

The theoretical literature show that auditing reduces the information asymmetry that exist between managers and firm stakeholders by allowing outsiders to verify the credibility and validity of financial statements (Becker et al, 1998; Lin and Hwang, 2010). Becker et al (1998) point out that the effectiveness of auditing, and its ability to constrain earnings management, will vary with the quality of the auditor. Becker et al (1998) further argue that high-quality external auditors are more likely to detect questionable accounting practices and, when detected, they can object to their use in the firm they audit. Also, Lin and Hwang (2010) argue that high quality external auditors act as agents responsible for verifying that the financial statement of an entity is fairly stated in conformity with generally accepted accounting principles (GAAP) and that financial statements reflect the true economic condition and operating results of the entity. External auditor's verification adds credibility to the financial statements of the entity. External auditors are considered to have high audit quality and their monitoring can constrain opportunistic earnings management and reduce the risk that the financial reports contain material misstatements or omissions (Lin and Hwang, 2010).

2.2. Literature review

In the literature, high accounting disclosure quality is commonly associated with the presence of Big 4 auditors. There is the expectation that the presence of a Big 4 auditor will lead to high audit quality (e.g. Blackwell et al, 1998; Francis et al., 1999, Huang and Li, 2009). Blackwell et al (1998) argue that a firm would prefer to choose the services of a Big 4 auditor because the reputation of Big 4 auditor reflects superior audit quality which in turn improves the quality of accounting information in audited financial reports. Kabir et al (2011) argue that Big 4 affiliate audit firms provide high-quality audits which manifest in observable differences in accruals quality between Big 4 audit firms and non-Big 4 (or local) audit firms.

The literature also shows that external auditors, such as Big 4 audit firms, provide additional monitoring and scrutiny of the financial accounting and reporting practices of firms, including banks, which helps to constrain distortions in reported accounting numbers and improve accounting disclosure quality (e.g. Ozili, 2017b; Huang et al, 2020; Che et al, 2020). DeBoskey and Jiang (2012) show that US banks audited by a Big 4 audit firm have reduced income smoothing. Alzoubi (2016) show that the level of earnings management is significantly reduced among firms that hire a Big 4 audit firm compared to firms utilising the service of a non-Big 4 audit firm.

A body of literature examine the influence of Big 4 auditors on earnings quality. For instance, Rusmin (2010) examines the association between the magnitude of earnings management and auditor quality among firms in Singapore, and find evidence of a negative association between

auditor quality and earnings management, which suggest that the magnitude of earnings management is reduced among firms engaging a Big 4 specialist audit firm compared to firms using the audit services of a non-Big 4 audit firm. Persakis and Iatridis (2016) investigate the joint effect of audit quality and investor protection on earnings quality during the 2008 financial crisis using a cross country sample. They find that higher audit quality leads to higher earnings quality in countries with strong investor protection. Rusmin et al (2014) investigate the effect of audit quality on income-increasing earnings management. Their univariate analysis show that the discretionary accruals in companies audited by Big 4 auditors are significantly smaller compared to that in non-Big 4 audited firms. Mokoaleli-Mokoteli and Iatridis (2017) investigate the relationship between Big 4 audit companies, earnings management and earnings conservatism among listed companies in South Africa. They find that companies audited by a Big 4 auditor have lower levels of earnings manipulation and higher conditional conservatism. Alzoubi (2016) examines the association between audit quality and earnings management among listed firms in Jordan from 2007 to 2010. The findings show a negative association between audit quality and earnings management. Earnings management is lower among companies hiring a Big 4 audit firm compared to companies hiring the services of a non-Big 4 audit firm. Orazalin and Akhmetzhanov (2019) investigate the effect of audit quality on earnings management and whether the relationship between earnings management and cost of debt is affected by audit quality. They show that higher audit quality (i.e., the presence of a Big 4 auditor) leads to a lower cost of debt but audit quality has no impact on earnings management.

Some studies focus on banks. For instance, Bouvatier et al (2014), focusing on European banks, examine whether bank income smoothing using loan loss provisions is influenced by external audit quality and other determinants. They find that banks audited by a Big 4 audit firm do not display a lower level of income smoothing using LLP than banks audited by a non-Big Four audit firm, which suggest that Big 4 auditors do not contribute to improving the quality of published financial statements of European banks. DeBoskey and Jiang (2012) examine the impact of auditor specialization on bank loan loss provisions for a large sample of US banks in the SOX period from 2002 to 2006. They find that bank managers use LLP to smooth earnings in the post-SOX period. However, this relationship was significantly reduced among banks audited by a Big 4 auditor. Kanagaretnam et al. (2010) investigate the influence of Big 4 auditor on bank earnings management. They investigate banks from 29 countries and find that both auditor type and auditor industry specialization moderates the extent of bank earnings management behaviour to beat a benchmark.

Few studies investigate earnings management among African banks. Amidu and Issahaku (2019) analyse the implications of IFRS adoption for earnings management by African banks, and find that the adoption of IFRS led to high-quality earnings among Africa banks. Salem et al (2020) examine the influence of voluntary disclosure quality on earnings management among banks in

the Middle East and North Africa (MENA) countries from 2006 to 2015. They find that high-quality voluntary disclosure reduces earnings management thereby improving the quality of financial reporting among MENA banks. Ozili (2017) examines the extent of income smoothing using loan loss provisions among listed banks and banks audited by Big 4 auditors. The study finds that listed African banks use loan loss provisions to smooth earnings. Income smoothing using LLP is not reduced among African banks audited by Big 4 auditors. Pinto et al (2019) investigate the role of corporate governance mechanisms and foreign direct investment in restraining or encouraging earnings management using loan loss provisions. They examine 112 listed and non-listed banks from 20 African countries during the 2011 to 2017 period. They find that banks use loan loss provisions to smooth income. They also find that ownership concentration increases income smoothing. Ozili and Outa (2018) examine the determinants of income smoothing using loan loss provisions among South African banks. They find that South African banks do not use loan loss provisions to smooth income when they are under-capitalised and have large non-performing loans. However, bank income smoothing is greater when South African banks are more profitable during economic boom periods, well-capitalised during boom periods and is greater among banks that adopt IFRS and among banks employing the services of a Big 4 auditor.

The present study adds to the literature by investigating income smoothing among African banks audited by Big 4 auditors and taking into account the effect of transient earnings, economic cycles and financial crisis. This study is different from Ozili (2017b) in several ways. Firstly, I test whether loan loss provisions are used to smooth high earnings, normal earnings or negative earnings of African banks. Ozili (2017b) did not do this analysis. Secondly, I undertook a pre-crisis, during-crisis and post-crisis analysis. Ozili (2017b) did not do this analysis. Finally, the model used in the present study is different from the model used in Ozili (2017b). In contrast to Ozili (2017b), the model used in the present study incorporates the most commonly used theoretical LLP determinants in the literature to ensure that the model is properly specified.

2.3. Hypotheses development

Certain economic factors or events such as financial crises, the need to avoid reporting a loss and other economic factors can compel banks to manage earnings more aggressively despite being audited by a Big-4 auditor. Prior research show that banks will smooth income to offset their declining earnings during a financial crisis (see El Sood 2012; Ozili and Arun, 2018). But their ability to smooth income depends on their opportunity and also depends on whether existing accounting disclosure and supervisory rules permit aggressive income smoothing in bad times. Ozili (2017b) show that African banks audited by Big 4 auditors engage in income smoothing using loan loss provisions. El Sood (2012), in a different context, show that U.S. banks use LLPs to smooth income in recessionary years despite the high quality accounting disclosure rules in the U.S. Generally, financial crises often have a devastating effect on African banks (Allen and Giovannetti, 2011), and bank managers will respond to mitigate the negative effects of the crisis.

Therefore, I predict that African banks will rely on income smoothing to offset their declining earnings. Therefore, consistent with El Sood (2012) and Ozili (2017b), I predict greater income smoothing during the financial crisis.

H1: African banks audited by Big 4 auditors use LLPs to smooth income during the global financial crisis

On the other hand, earnings management may decrease in crisis years due to a higher market tolerance for poor performance (Filip and Raffournier, 2014). This is because the markets are unlikely to punish banks or firms that perform poorly during a crisis. Moreover, firms may want to attract investors in crisis years because it is difficult for investors to assess which firms are good and bad during a crisis that affects all firms. Therefore, common incentives of entities to attract potential investors during a crisis could lead them to provide a high-quality financial reporting (Cimini, 2015), and this can be achieved through reduced income smoothing or lower earnings management. When this is the case, I do not expect banks to smooth income.

H2: African banks audited by Big 4 auditors do not use LLPs to smooth income during the global financial crisis

3. Data and Methodology

3.1. Data

The sample consists of banks from African countries. I restrict the sample to African banks that are clients of the major Big 4 audit firms: KPMG, Ernst and Young, PriceWaterhouseCoopers and Deloitte. The sample period covers the 2002 to 2014 period. The sample period is sufficient to cover at least a full economic cycle; in other words, the sample period is sufficient to capture economic downturns and booms in each African country.

Bank balance sheet and income statement information were collected from Bankscope database. Macroeconomic information was collected from the World Economic Forum archived in World Bank database. Data was collected for 21 African countries that have complete financial information for the variables of interest in the study. The countries are: South Africa, Ghana, Egypt, Tunisia, Morocco, Kenya, Uganda, Zambia, Tanzania, Ethiopia, Togo, Angola, Cameroun, Algeria, Mauritius, Namibia, Botswana, Senegal, Nigeria, Malawi and Mozambique. Table 1 report the African country and banks audited by a Big-4 auditor in the sample.

Table 1: Sample description			
S/N	Country	No of banks	Big 4 auditor banks
1	South Africa	30	27
2	Ghana	21	19
3	Egypt	21	15
4	Tunisia	27	3
5	Morocco	15	9
6	Kenya	31	25
7	Uganda	20	16
8	Zambia	17	17
9	Tanzania	28	21
10	Ethiopia	11	0
11	Togo	10	1
12	Angola	17	13
13	Cameroun	11	6
14	Algeria	17	0
15	Mauritius	14	9
16	Namibia	10	9
17	Botswana	14	14
18	Senegal	11	3
19	Nigeria	21	20
20	Malawi	10	8
21	Mozambique	14	14
	Total	370	249
Source: Author's computation from Bankscope data			

3.2. Methodology

3.2.1. Model

The baseline model to test for income smoothing using LLP among African banks was derived following the approach of Bushman and Williams (2012), Kilic et al. (2013), Curcio and Hasan (2015) and Ozili and Arun (2018), and is expressed below:

$$LLP_{i,t} = \beta_1 EBTP_{i,t} + \beta_2 NPL_{i,t} + \beta_3 LOTA_{i,t} + \beta_4 CAP_{i,t} + \beta_5 \Delta GDP_t + \epsilon_{i,t}. \text{ Equation (1)}$$

Where: 'i' = bank; 't' = year; LLP = ratio of total loan loss provisions to beginning total assets; EBTP = ratio of earnings before provisions and tax scaled to beginning total assets; NPL = ratio of non-performing loans to beginning total assets; CAP = ratio of total equity to beginning total assets; LOTA = ratio of total loan to beginning total assets; ΔGDP = real gross domestic product growth rate; ϵ = error term.

3.2.2. Variable justification

The LLP ratio is the dependent variable (Pool et al, 2015; Curcio and Hasan, 2015; Ozili, 2019). This variable is deflated by beginning total assets following the approach of Kilic et al. (2013) to take into account known values of each bank characteristic.

The EBTP ratio is the ratio of earnings before tax and loan loss provisions divided by beginning total assets. The earnings before tax and loan loss provisions variable is derived by adding-back loan loss provisions to the earnings before tax number (Ozili, 2017a). A positive (and significant) relationship between LLP and EBTP is evidence for smoothed earnings (see. Curcio and Hasan, 2015; Ozili, 2019; Pinto et al, 2019), and suggest that banks lower loan loss provisions to increase low earnings or increase loan loss provisions to decrease high earnings in the current period.

The NPL ratio is the ratio of nonperforming loans to beginning asset (Ozili, 2019). NPL captures specific loan loss provisions that banks must set aside for expected loan losses. Curcio and Hasan (2015) and Ozili (2019) predict and find a positive relationship between LLP and the NPL coefficient. Thus, a positive relationship between LLP and NPL is predicted.

The CAP ratio is the ratio of total equity to beginning total asset. The CAP variable controls for capital management incentives to manipulate loan loss provisions estimate. Ozili and Arun (2018) suggest that bank managers can increase loan loss provisions when they have low capital levels to compensate for their low capital levels, or reduce loan loss provisions when they have higher capital levels. Therefore, a negative relationship between LLP and CAP is predicted.

The LOTA ratio reflects the default risk of bank loan portfolio (e.g. El Sood, 2012; Bouvatier et al., 2014). Banks that have a high loan to asset ratio have high loan default risk and will keep more loan loss provisions to compensate for the increase in default risk on the loan portfolio, implying a positive relationship between LLP and LOTA (Ozili and Arun, 2018). Thus, a positive relationship between LLP and LOTA is predicted.

Δ GDP is the real gross domestic product growth rate. It captures macroeconomic fluctuations. The literature argue that banks keep higher loan loss provisions during economic downturns and keep fewer loan loss provisions during periods of economic prosperity (e.g. Skafa, 2015; Ozili and Outa, 2017; Pool et al, 2015), implying a negative relationship between LLP and Δ GDP. Table 2 reports the expected signs for the variables.

Variable	Expected/Predicted Sign
NPL	(+)
CAP	(-)
EBTP	(+)
LOTA	(+)
Δ GDP	(-)

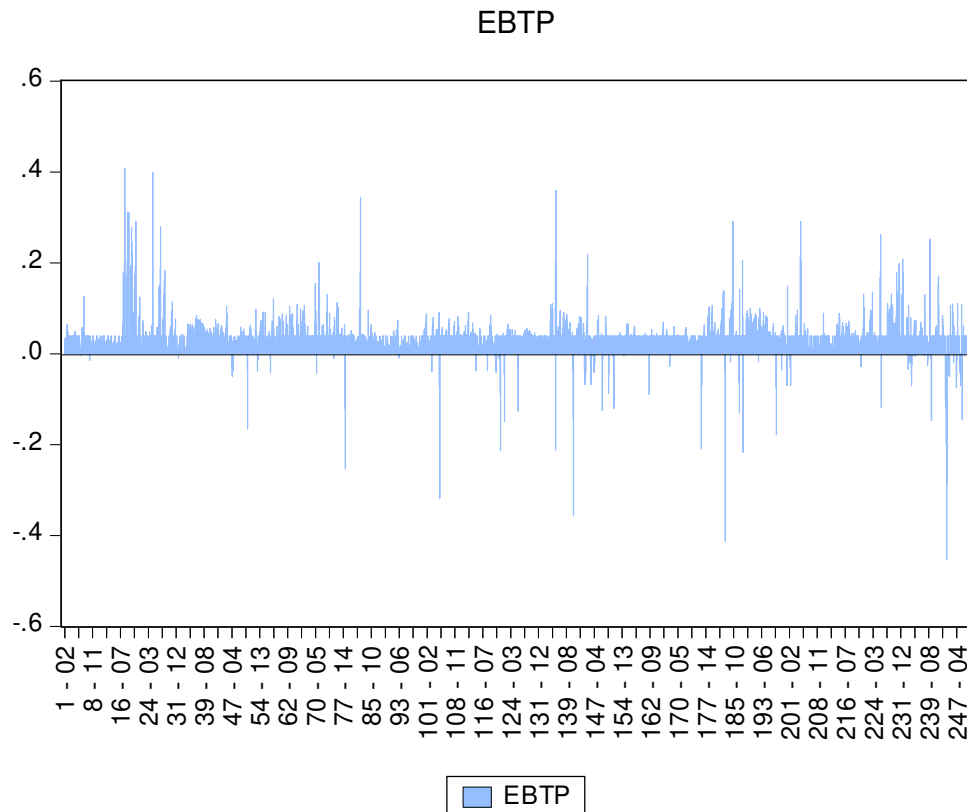
Source: Author's computation

3.3. Estimation methodology

The fixed effect regression estimation technique was used to test for income smoothing. Bank and year fixed effects were applied (Petersen, 2009). This approach is consistent with prior studies such as Bushman and William (2012), Bouvatier et al (2014) and Ozili and Arun (2018). Also, the hausman test was used to make a choice between fixed effect and random effect. The result of the hausman test showed that the fixed effect regression method is the appropriate approach to use. The fixed effect regression estimation controls for unobservable bank-specific and period differences that vary across banks in each year. Using fixed effect regression estimation also avoids over-stating the t-statistics which is a common problem associated with pooled OLS estimation.

3.4. Trend in earnings management

Figure 1 below shows the trend in earnings management by African banks audited by a Big-4 auditor. It shows that earnings management is stable across the period with only few extreme fluctuations at specific intervals.



3.5. Descriptive statistics and correlation

3.5.1. Descriptive statistics

The summary of the descriptive statistics result is reported in table 3. LLPs are on average 1.2%, which is lower than the average NPL ratio at 4.9%. This suggest that there is under-provisioning by African banks audited by a Big 4 auditor as the average LLPs are lower than average NPLs. Also, the CAP ratio is on average 18.5%, which is above the Basel 2 minimum Tier 1 capital requirement of 8%. This suggest that African banks audited by a Big 4 auditor are well-capitalized. The LOTA ratio is 61.2%, which suggest that loans make up a large portion of the total assets of African banks audited by a Big 4 auditor.

Statistic	LLP	EBTP	CAP	LOTA	NPL	Δ GDP
Mean	0.012	0.039	0.185	0.612	0.049	0.058
Median	0.006	0.034	0.139	0.594	0.026	0.055
Maximum	0.463	0.408	3.688	1.615	0.874	0.337
Minimum	-0.108	-0.453	-0.490	0.005	0.0002	-0.076
Std. Dev.	0.023	0.052	0.171	0.249	0.079	0.038
Skewness	6.429	-0.220	5.947	0.431	5.404	2.943
Observation	2061	2028	2092	2075	1523	3237

Source: Author's computation. LLP = total loan loss provisions scaled by beginning total assets. EBTP = earnings before provisions and tax scaled by beginning total assets. NPL = non-performing/impaired loans scaled by beginning total assets. CAP = total equity scaled by beginning total assets. LOTA = total loan scaled by beginning total assets. Δ GDP = real gross domestic product growth rate.

3.5.2. Correlation

The correlation results in table 4 show that LLP is significant and positively correlated with EBTP, CAP, LOTA and NPL, although the strength of the correlation is quite low. The positive correlation between LLP and EBTP suggest that high earnings are followed by high LLPs. On the other hand, LLP is negatively correlated with Δ GDP and the correlation coefficient is insignificant.

Table 4: Correlation analysis

Variables	LLP	EBTP	CAP	LOTA	NPL	ΔGDP
LLP	1.000 -----					
EBTP	0.287*** (11.51)	1.000 -----				
CAP	0.212*** (8.36)	0.195*** (7.67)	1.000 -----			
LOTA	0.234*** (9.26)	0.138*** (5.35)	0.235*** (9.29)	1.000 -----		
NPL	0.352*** (14.49)	0.052** (2.03)	0.174*** (6.79)	0.255*** (10.13)	1.000 -----	
ΔGDP	-0.015 (-0.58)	0.021 (0.81)	0.017 (0.65)	-0.055** (-2.12)	-0.038 (-1.49)	1.000 -----

Source: Author's computation. LLP = ratio of total loan loss provisions scaled to beginning total assets. EBTP = ratio of earnings before provisions and tax scaled to beginning total assets. NPL = ratio of non-performing loans to beginning total assets. CAP = ratio of total equity scaled to beginning total assets. LOTA = ratio of total loan to beginning total assets. ΔGDP = real gross domestic product growth rate. T-statistic is reported in parenthesis. ***, **, * denote statistical significance at 1%, 5% and 10%.

4. Regression Result

4.1. Testing the income smoothing hypothesis

The result is reported in column 1 of table 5. The EBTP coefficient is positive and significant at the 1% significance level. This indicates that African banks audited by a Big 4 auditor use loan loss provisions to smooth income. This implies that the presence of Big 4 auditors did not discourage African banks from using loan loss provisions to smooth reported earnings. This result supports the findings of prior studies such as Curcio and Hasan (2015), Ozili and Arun (2018), Kanagaretnam et al (2003), Ozili (2017b), El Sood (2012) and Liu and Ryan (2006).

For the control variables, NPL coefficient is positive and significant as expected. This suggests that African banks audited by a Big 4 auditor increase loan loss provisions when they expect high non-performing loans. This is consistent with Ozili and Arun (2018) who argue that banks set aside specific provisions for expected loan losses. LOTA coefficient is positive and significant. This indicates that African banks audited by a Big-4 auditor increase loan loss provision estimates when default risk increases. CAP coefficient is negative and significant. This indicates that African

banks audited by a Big-4 auditor keep higher loan loss provisions to compensate for their low capital levels and vice versa (El Sood, 2012). Δ GDP coefficient is statistically insignificant.

Table 5: Fixed effect regression estimation: income smoothing and earnings effect				
	(1)	(2)	(3)	(4)
Variable	Coefficient (T-statistic)	Coefficient (T-statistic)	Coefficient (T-statistic)	Coefficient (T-statistic)
c	-0.002 (-1.47)	-0.003*** (-2.68)	0.003** (2.07)	0.009*** (4.46)
EBTP	0.117*** (15.15)	0.237*** (22.03)	0.028** (2.39)	0.012 (0.74)
CAP	0.001 (0.45)	-0.011*** (-4.49)	-0.006** (-2.42)	-0.011*** (-4.49)
LOTA	0.009*** (5.11)	0.006*** (3.73)	0.008*** (4.58)	0.006*** (3.73)
NPL	0.091*** (15.46)	0.082*** (14.48)	0.085*** (14.75)	0.082*** (14.48)
GDP	-0.012 (-1.39)	-0.012 (-1.60)	-0.012 (-1.52)	-0.012 (-1.60)
NEG		0.012*** (7.03)		
NEG*EBTP		-0.225*** (-11.17)		
HIGH			-0.008*** (-8.67)	
HIGH*EBTP			0.195*** (11.75)	
POS				-0.012*** (-7.03)
POS*EBTP				0.225*** (11.17)
Bank fixed effect	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes
Adjusted R ²	40.13	44.61	42.99	44.61
F-statistic	9.18	10.76	10.14	10.76
P(F-statistic)	0.000	0.000	0.000	0.000
Observation	3237	3237	3237	3237

Source: Author's computation. LLP = ratio of total loan loss provisions scaled to beginning total assets. EBTP = ratio of earnings before provisions and tax scaled to beginning total assets. NPL = ratio of non-performing loans to beginning total assets. CAP = ratio of total equity scaled to beginning total assets. LOTA = ratio of total loan to beginning total assets. Δ GDP = real gross domestic product growth rate. NEG = binary variable equals one if EBTP ratio is negative and zero otherwise. POS = binary variable equals one if EBTP ratio is positive and zero otherwise. HIGH = binary variable equals one if EBTP ratio is above-the-median EBTP and zero otherwise. ***, **, * denote significance at 1%, 5% and 10% level. T-statistic is reported in parenthesis.

4.2. Income smoothing along the earnings distribution

4.2.1. Negative earnings

Additional test was conducted to determine whether African banks use loan loss provisions to smooth earnings when they expect a loss or negative earnings. To do this, the NEG binary variable was introduced into the model to capture negative earnings. The 'NEG' binary variable takes the value of one if EBTP ratio is negative and zero otherwise. The result is reported in column 2 of table 5.

NEG*EBTP coefficient is negative and significant. This indicates that African banks audited by a Big-4 auditor do not use loan loss provisions to smooth earnings when they expect a loss or negative earnings. The result does not support the findings of El Sood (2012), Liu and Ryan (2006) and Ozili (2021). Overall, the findings suggest that African banks audited by a Big-4 auditor do not use loan loss provisions to smooth negative earnings.

4.2.2. Positive and high earnings

Additional test was performed to determine whether African banks use loan loss provisions to smooth positive or high earnings. El Sood (2012) observe that US banks use loan loss provisions to smooth earnings when they are more profitable, that is, when they have high earnings. Following El Sood (2012)'s approach, two binary variables, POS and HIGH, were introduced into the model to capture high profitability, i.e., positive earnings (POS) and high earnings (HIGH). The 'POS' binary variable takes the value of one if EBTP ratio is positive and zero otherwise. The 'HIGH' binary variable takes the value of one if EBTP ratio is above-the-median EBTP and zero otherwise. The latter is consistent with El Sood (2012). The POS and HIGH binary variables were interacted with the EBTP variable to determine whether African banks audited by a Big 4 auditor use loan loss provisions to smooth reported earnings when they are more profitable. The result is reported in column 3 and 4 of Table 5.

POS*EBTP coefficient is positive and significant. This indicates that African banks audited by a Big 4 auditor use loan loss provisions to smooth positive earnings. HIGH*EBTP coefficient is also positive and significant. This indicates that African banks audited by a Big 4 auditor use loan loss provisions to smooth high earnings. The result supports the findings of Liu and Ryan (2006). Overall, the findings suggest that African banks audited by a Big 4 auditor use loan loss provisions to smooth positive earnings and high earnings.

4.3. Income smoothing along economic cycles

In theory, banks are generally more profitable during economic boom periods and less profitable during economic downturns (see Albertazzi and Gambacorta, 2009; Bolt et al, 2012). Accordingly, an additional test was conducted to determine whether the incentive to use loan loss provisions to smooth reported earnings simultaneously depend on the state of the economy and on the size of bank earnings. Two binary variables were introduced, namely BOOM and REC. The BOOM binary variable equals one if Δ GDP is above-the-median Δ GDP and zero otherwise, representing periods of economic boom. The REC binary variable equals one if Δ GDP is negative and zero otherwise, representing periods of economic downturn or recession.

The results are reported in Table 6. The BOOM*POS*EBTP and BOOM*HIGH*EBTP coefficients are negative and significant in column 4 and 5. This indicates that African banks audited by a Big-4 auditor do not use loan loss provisions to smooth earnings when they are profitable during economic booms. The REC*NEG*EBTP coefficient is positive and significant in column 3, and indicates that African banks audited by a Big-4 auditor use loan loss provisions to smooth earnings when they expect a loss during a recession. The result supports the findings of Ozili and Arun (2018).

Furthermore, REC*EBTP coefficient is positive and significant in column 1. This indicates that African banks audited by a Big-4 auditor use loan loss provisions to smooth earnings during economic downwards. This result supports the findings of El Sood (2012). The BOOM*EBTP coefficient is negative and significant in column 2. This indicates that African banks audited by a Big-4 auditor do not use loan loss provisions to smooth earnings during economic booms. Overall, the results suggest that income smoothing is more pronounced during economic downturns.

	(1)	(2)	(3)	(4)	(5)
Variable	Coefficient (T-statistic)	Coefficient (T-statistic)	Coefficient (T-statistic)	Coefficient (T-statistic)	Coefficient (T-statistic)
c	-0.001 (-1.22)	-0.005*** (-3.82)	-0.003** (-2.46)	0.013*** (6.78)	-0.002 (-1.62)
EBTP	0.109*** (14.03)	0.226*** (21.53)	0.166*** (18.67)	0.208*** (20.56)	0.154*** (16.78)
CAP	0.0004 (0.18)	-0.001 (-0.36)	-0.003 (-1.24)	-0.001 (0.61)	0.003 (1.07)
LOTA	0.009*** (5.30)	0.009*** (4.95)	0.008*** (4.69)	0.009*** (5.26)	0.009*** (5.51)
NPL	0.090*** (15.51)	0.078*** (13.60)	0.086*** (14.99)	0.080*** (13.98)	0.084*** (14.47)
GDP	-0.012 (-1.41)	0.002 (0.16)	-0.012 (-1.41)	0.002 (0.18)	0.002 (0.26)
REC	-0.011*** (-3.71)		0.002 (0.93)		
BOOM		0.006*** (6.56)		0.004*** (3.74)	0.002* (1.75)
POS				-0.018*** (-10.99)	
HIGH					-0.002** (-1.99)
REC*EBTP	0.233*** (7.44)				
BOOM*EBTP		-0.200*** (-14.67)			
NEG			0.018*** (10.79)		
REC*NEG*EBTP			2.598*** (3.07)		
BOOM*POS*EBTP				-0.135*** (-8.21)	
BOOM*HIGH*EBTP					-0.096*** (-6.47)
Bank fixed effect			Yes	Yes	Yes
Year fixed effect			Yes	Yes	Yes
Adjusted R ²	41.19	44.25	42.45	43.65	41.26
F-statistic	9.49	10.62	9.91	10.35	9.48
P(F-statistic)	0.000	0.000	0.000	0.000	0.000
Observation	3237	3237	3237	3237	1479

Source: Author's computation. LLP = ratio of total loan loss provisions scaled to beginning total assets. EBTP = ratio of earnings before provisions and tax scaled to beginning total assets. NPL = ratio of non-performing loans to beginning total assets. CAP = ratio of total equity scaled to beginning total assets. LOTA = ratio of total loan to beginning total assets. ΔGDP = real gross domestic product growth rate. NEG = binary variable equals one if EBTP ratio is negative and zero otherwise. POS = binary variable equals one if EBTP ratio is positive and zero otherwise. HIGH = binary variable equals one if EBTP ratio is above-the-median EBTP and zero otherwise. BOOM = binary variable equals one

if ΔGDP is above-the-median ΔGDP and zero otherwise. REC = binary variable equals one if ΔGDP is negative and zero otherwise ***, **, * denote significance at 1%, 5% and 10% level. T-statistic is reported in parenthesis.

4.4. Financial crisis

In this section, I check whether earnings management by African banks is present before, during and after the 2007/2008 global financial crisis. To do this, the PRE binary variable was introduced into the model to capture the pre-financial crisis period. The PRE binary variable equals one for the year 2002, 2003, 2004, 2005 and 2006, and zero otherwise. The DUR binary variable was introduced into the model to capture the financial crisis period. The DUR binary variable equals one for the year 2007 and 2008, and zero otherwise. The POST binary variable was introduced into the model to capture the periods after the global financial crisis. The POST binary variable equals one for the year 2009, 2010, 2011, 2012, 2013 and 2014, and zero otherwise. The PRE, DUR and POST variables are interacted with the EBTP variable. The results are reported in tables 7, 8 and 9.

4.4.1. Before the financial crisis

The pre-financial crisis results are reported in table 7. The PRE*EBTP coefficient is positive and significant. This indicates that African banks audited by a Big-4 auditor use LLP to smooth reported earnings before the global financial crisis. This finding supports the income smoothing hypothesis.

Next, I test whether income smoothing using LLP is higher or reduced when African banks expect a loss, normal (positive) earnings or high earnings in the pre-crisis period. The PRE*NEG*EBTP coefficient is negative and significant. This indicates that African banks audited by a Big-4 auditor do not use LLP to smooth earnings when they expect a loss in the pre-crisis period. The PRE*POS*EBTP and PRE*HIGH*EBTP coefficients are positive and significant. This indicates that African banks audited by a Big-4 auditor use LLP to smooth income when they expect positive (or non-negative) earnings and high earnings in the pre-crisis period. Overall, the findings suggest that African banks audited by a Big-4 auditor smooth income to reduce the size of high earnings in the pre-crisis period.

Table 7: Fixed effect regression estimation – income smoothing in the pre-financial crisis period				
	(1)	(2)	(3)	(4)
Variable	Coefficient (T-statistic)	Coefficient (T-statistic)	Coefficient (T-statistic)	Coefficient (T-statistic)
C	-0.0001 (-0.08)	-0.002* (-1.69)	0.019*** (9.30)	0.005*** (3.61)
EBTP	0.093*** (9.76)	0.173*** (18.71)	0.129*** (13.28)	0.101*** (11.62)
CAP	0.001 (0.36)	-0.004* (-1.86)	-0.007*** (-2.72)	-0.002 (-0.87)
LOTA	0.009*** (4.85)	0.007*** (4.42)	0.007*** (3.87)	0.008*** (4.47)
NPL	0.091*** (15.32)	0.086*** (14.88)	0.081*** (14.22)	0.083*** (14.37)
GDP	-0.019** (2.48)	-0.019** (-2.58)	-0.019** (-2.52)	-0.019** (-2.41)
PRE	-0.002** (-2.21)	-0.0003 (-0.48)	-0.006*** (-7.12)	-0.005*** (-6.71)
PRE*EBTP	0.059*** (4.21)			-0.055*** (-2.75)
NEG		0.017*** (9.47)		
NEG*PRE*EBTP		-0.070*** (-2.89)		
POS			-0.018*** (-10.68)	
POS*PRE*EBTP			0.139*** (9.03)	
HIGH				-0.005*** (-6.23)
HIGH*PRE*EBTP				0.134*** (9.30)
Bank fixed effect	Yes	Yes	Yes	Yes
Year fixed effect	No	No	No	No
Adjusted R ²	40.30	42.29	43.67	41.87
F-statistic	9.57	10.26	10.79	10.10
P(F-statistic)	0.000	0.000	0.000	0.000
Observation	3237	3237	3237	3237
Source: Author's computation. Source: Author's computation. LLP = ratio of total loan loss provisions scaled to beginning total assets. EBTP = ratio of earnings before provisions and tax scaled to beginning total assets. NPL = ratio of non-performing loans to beginning total assets. CAP = ratio of total equity scaled to beginning total assets. LOTA = ratio of total loan to beginning total assets. ΔGDP = real gross domestic product growth rate. NEG = binary variable equals one if EBTP ratio is negative and zero otherwise. POS = binary variable equals one if EBTP ratio is positive and zero otherwise. HIGH = binary variable equals one if EBTP ratio is above-the-median EBTP and zero otherwise. PRE = binary variable equals one for the pre-financial crisis period from 2002 to 2006 and zero otherwise. ***, **, * denote significance at 1%, 5% and 10% level. T-statistic is reported in parenthesis.				

4.4.2. During the financial crisis

The results are reported in table 8. The $DUR*EBTP$ coefficient is negative and significant. This indicates that African banks audited by a Big-4 auditor do not use LLP to smooth reported earnings during the global financial crisis. This finding contradicts the findings of El Sood (2012).

Next, I test whether income smoothing using LLP is higher or reduced when African banks expect a loss, normal (positive) earnings or high earnings during the crisis. The $DUR*NEG*EBTP$ coefficient is negative and significant. This indicates that African banks audited by a Big-4 auditor do not use LLP to smooth earnings when they expect a loss during the crisis. This result does not support the findings of El Sood (2012).

The $DUR*POS*EBTP$ and $DUR*HIGH*EBTP$ coefficients are positive and significant. This indicates that African banks audited by a Big-4 auditor use LLP to smooth income when they expect positive (or non-negative) earnings and high earnings during the crisis. This result supports the findings of Ozili and Arun (2018). This result may be explained by the need to avoid reporting unexpected good news in bad times such as reporting high profits during a financial crisis. Such surprise earnings announcement by banks may attract regulatory and political scrutiny into banks' earnings. To avoid this, bank managers will smooth income to lower high earnings in order to avoid regulatory and political scrutiny. Overall, the findings suggest that African banks audited by a Big-4 auditor smooth income to reduce the size of high earnings during the crisis.

Table 8: Fixed effect regression estimation – income smoothing during the financial crisis				
	(1)	(2)	(3)	(4)
Variable	Coefficient (T-statistic)	Coefficient (T-statistic)	Coefficient (T-statistic)	Coefficient (T-statistic)
C	-0.001 (-1.22)	-0.003** (-2.13)	0.015** (7.95)	0.001 (0.47)
EBTP	0.126*** (14.02)	0.196*** (20.53)	0.155** (16.49)	0.121*** (14.10)
CAP	0.001 (0.34)	-0.006** (-2.56)	-0.004* (-1.75)	0.001 (0.37)
LOTA	0.009*** (4.85)	0.007*** (4.08)	0.008*** (4.47)	0.009*** (4.97)
NPL	0.091*** (15.51)	0.086*** (15.05)	0.087*** (15.16)	0.090*** (15.37)
GDP	-0.019** (2.48)	-0.019** (-2.57)	-0.018** (-2.35)	-0.017** (-2.27)
DUR	0.002*** (2.57)	0.0002 (0.22)	-0.002* (-1.70)	-0.001 (-0.77)
DUR*EBTP	-0.029** (-2.10)			-0.055*** (-2.75)
NEG		0.018*** (10.89)		
DUR*NEG*EBTP		-0.167*** (-8.17)		
POS			-0.017*** (-10.38)	
DUR*POS*EBTP			0.065*** (3.47)	
HIGH				-0.003*** (-3.77)
DUR*HIGH*EBTP				0.048*** (2.76)
Bank fixed effect	Yes	Yes	Yes	Yes
Year fixed effect	No	Yes	No	No
Adjusted R ²	40.07	43.43	42.40	40.37
F-statistic	9.49	10.71	10.31	9.56
P(F-statistic)	0.000	0.000	0.000	0.000
Observation	3237	3237	3237	3237

Source: Author's computation. Source: Author's computation. LLP = ratio of total loan loss provisions scaled to beginning total assets. EBTP = ratio of earnings before provisions and tax scaled to beginning total assets. NPL = ratio of non-performing loans to beginning total assets. CAP = ratio of total equity scaled to beginning total assets. LOTA = ratio of total loan to beginning total assets. ΔGDP = real gross domestic product growth rate. NEG = binary variable equals one if EBTP ratio is negative and zero otherwise. POS = binary variable equals one if EBTP ratio is positive and zero otherwise. HIGH = binary variable equals one if EBTP ratio is above-the-median EBTP and zero otherwise. DUR = binary variable equals one during the financial crisis period from 2007 to 2008 and zero otherwise. ***, **, * denote significance at 1%, 5% and 10% level. T-statistic is reported in parenthesis.

4.4.3. Post-financial crisis period

The post-financial crisis results are reported in table 9. The $POST*EBTP$ coefficient is negative and significant. This indicates that African banks audited by a Big-4 auditor do not use LLP to smooth reported earnings in the post-crisis period. This finding does not support the findings of Ozili (2017a) who find evidence for income smoothing in the post-financial crisis period.

Next, I test whether income smoothing using LLP is greater or reduced when African banks expect a loss, normal (positive) earnings or high earnings in the post-financial crisis period. The $POST*NEG*EBTP$ coefficient is not significant. The $POST*POS*EBTP$ and $POST*HIGH*EBTP$ coefficients are negative and significant. This indicates that African banks audited by a Big-4 auditor do not use LLP to smooth income when they expect positive (or non-negative) earnings and high earnings in the post-crisis period. This may be due to the stringent bank supervision and strict IFRS disclosure rules that were introduced in many African countries after the global financial crisis which discouraged the opportunistic manipulation of LLPs for earnings management purposes. Overall, the findings suggest that African banks audited by a Big-4 auditor did not use LLP to smooth income in the post-financial crisis period.

Table 9: Fixed effect regression estimation – income smoothing in the post-financial crisis period				
	(1)	(2)	(3)	(4)
Variable	Coefficient (T-statistic)	Coefficient (T-statistic)	Coefficient (T-statistic)	Coefficient (T-statistic)
C	-0.001 (-0.84)	-0.002* (-1.72)	0.016*** (8.23)	0.002 (0.16)
EBTP	0.126*** (14.71)	0.166*** (18.59)	0.181*** (18.44)	0.132*** (14.83)
CAP	0.001 (0.43)	-0.003 (-1.42)	-0.003 (-1.39)	0.001 (0.59)
LOTA	0.009*** (4.90)	0.008*** (4.56)	0.008*** (4.53)	0.009*** (5.01)
NPL	0.091*** (15.49)	0.086*** (15.04)	0.086*** (14.93)	0.089*** (15.17)
GDP	-0.017** (2.14)	-0.019** (-2.39)	-0.018** (-2.26)	-0.018** (-2.25)
POST	0.0004 (0.51)	-0.001 (-0.98)	0.002** (2.36)	0.0005 (0.57)
POST*EBTP	-0.038** (-2.50)			
NEG		0.017*** (10.19)		
POST*NEG*EBTP		-0.031 (-0.63)		
POS			-0.019*** (-11.01)	
POST*POS*EBTP			-0.059*** (-3.67)	
HIGH				-0.003*** (-3.02)
POST*HIGH*EBTP				-0.025* (-1.68)
Bank fixed effect	Yes	Yes	Yes	Yes
Year fixed effect	No	No	No	No
Adjusted R ²	40.14	42.15	42.41	40.25
F-statistic	9.51	10.21	10.31	9.52
P(F-statistic)	0.000	0.000	0.000	0.000
Observation	3237	3237	3237	3237

Source: Author's computation. LLP = ratio of total loan loss provisions scaled to beginning total assets. EBTP = ratio of earnings before provisions and tax scaled to beginning total assets. NPL = ratio of non-performing loans to beginning total assets. CAP = ratio of total equity scaled to beginning total assets. LOTA = ratio of total loan to beginning total assets. ΔGDP = real gross domestic product growth rate. NEG = binary variable equals one if EBTP ratio is negative and zero otherwise. POS = binary variable equals one if EBTP ratio is positive and zero otherwise. HIGH = binary variable equals one if EBTP ratio is above-the-median EBTP and zero otherwise. POST = binary variable equals one in the post-financial crisis era from 2009 to 2014 and zero otherwise. ***, **, * denote significance at 1%, 5% and 10% level. T-statistic is reported in parenthesis.

5. Conclusion

This paper examined whether African banks audited by a Big 4 auditor use loan loss provisions for income smoothing purposes before, during and after the global financial crisis.

Using a sample of 249 banks from 21 countries, the findings are consistent with the income smoothing hypothesis. First, the correlation results show a significant and positive correlation between the pre-provisions earnings variable and LLP which suggest that high earnings are followed by high LLPs. This indicates income smoothing. Secondly, the descriptive statistic results show that, on average, loan loss provisions are lower than nonperforming loans for African banks audited by a Big 4 auditor. Also, banks appear to be well-capitalized and have a high total loan to total asset ratio. The regression results reveal that African banks audited by Big 4 auditors use loan loss provisions to smooth income, and the incentive to smooth income is stronger during economic downturns or recessions. Also, African banks audited by a Big 4 auditor used income smoothing to lower high earnings during the financial crisis and in the pre-financial crisis period but not in the post-financial crisis period.

The implication of the findings is that financial crises create additional incentives for bank managers to smooth income. Smoothing income during the crisis helped African banks to reduce the devastating effect of the financial crisis on African banks' balance sheet. The use of a Big 4 auditor by African banks during a financial crisis did not constrain the extent of income smoothing because banks will prioritise their survival over high earnings quality in crisis years. Standard setters and bank regulators in Africa should increase their monitoring of banks' financial reporting disclosure to ensure that banks' reported earnings are transparent in crisis years while at the same time prioritising banks' survival during financial crises, as banks tend to use income smoothing as a survival mechanism during crises. Moreover, the expectation of low quality earnings in crisis years may compel investor analysts and other users of financial statement information to rely on alternative measures of earnings quality to assess the quality of African banks' reported earnings during financial crises.

There are two main limitations of the study. One, it did not examine all the banks in African countries. The study focused only on African banks audited by a Big 4 auditor. Two, it did not examine the income smoothing behavior of African banks audited by non-Big 4 audit firms. Three, loan loss provision is not the only accounting number that can be used to achieve income smoothing. This study did not examine other accounting numbers that bank managers can use to smooth income. Future research should examine the effect of monitoring by institutional block-holders in constraining earnings management among African banks as an alternative to monitoring by Big 4 auditors. Future studies can extend the analyses in this study to other regions such as banks in Australia and Asia. Future studies can also examine the impact of audit quality on other forms of earnings management other than income smoothing.

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