Determinants of bank income smoothing using loan loss provisions in the United Kingdom

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Abstract

This paper investigates the determinants of bank income smoothing using loan loss provisions in the United Kingdom from 1999 to 2017. The findings show that UK banks use loan loss provisions for income smoothing purposes. Income smoothing is greater in times of high economic policy uncertainty. The extent of bank income smoothing is reduced by foreign bank presence, UK GAAP adoption, IFRS9 adoption, and high levels of voice and accountability. Also, there is reduced income smoothing using loan loss provisions during a financial crisis and in periods of economic prosperity. The implication is that economic conditions, institutional governance and accounting disclosure rules influence the extent of bank income smoothing in the United Kingdom. The findings of the study contribute to several studies that explore the determinants of bank income smoothing in a single country context.

Keywords: banks, earnings management, United Kingdom, loan loss provisions, income smoothing, economic policy uncertainty, Great Britain, accounting disclosure, financial crisis.

JEL Code: G21, G28, M10, M14.

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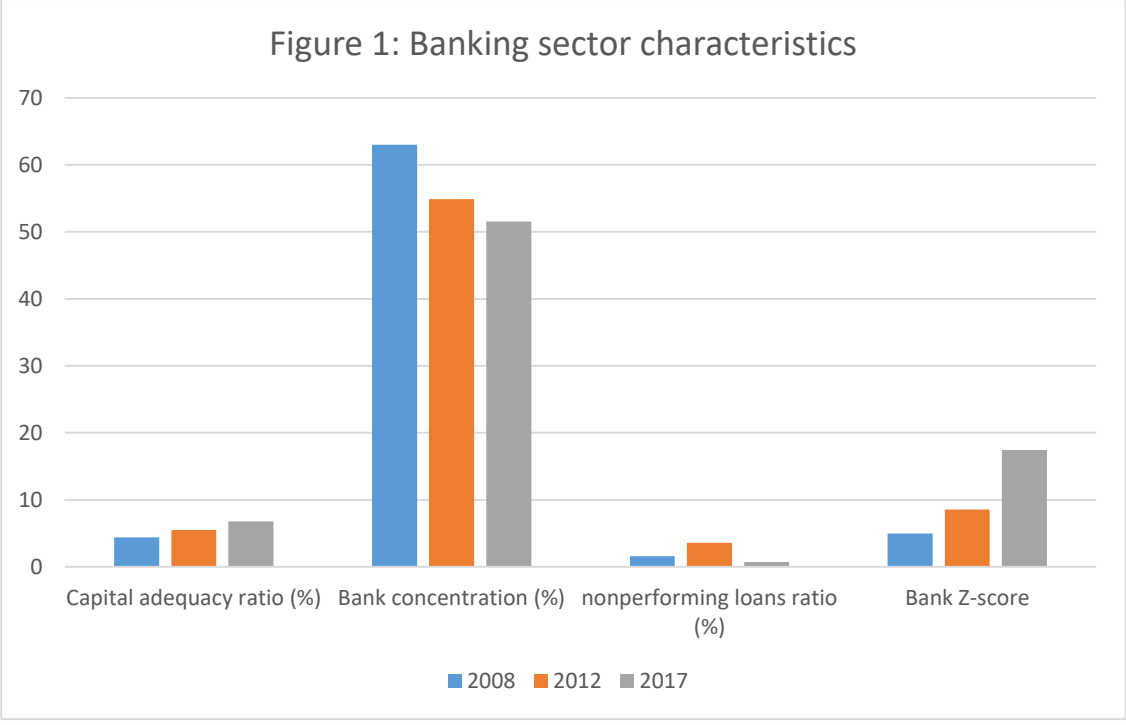
1. Introduction

There are ongoing debates about the determinants of bank income smoothing. Some studies argue that internal factors may influence bank managers to smooth income when they have the opportunity (e.g. Bouvatier et al, 2014; Peterson and Arun 2018). Other studies affirm that external factors, such as institutional monitoring and macroeconomic conditions, play a greater role in constraining or encouraging income smoothing (e.g. Vasilakopoulos et al, 2018; Pinto et al, 2019; Salem et al, 2021; Doan et al, 2020). Also, in the literature, there is a consensus that country differences affect the quality of institutions and macroeconomic management, and it affects the ability of institutions to monitor bank behavior (see, for example, Bakir, 2013; Lensink and Meesters, 2014; Ozili and Outa, 2017), and the incentive to smooth income (Ozili, 2019b).

Generally, income smoothing allows banks to smooth out extreme fluctuations in earnings so that reported earnings is never too high or too low. The banking literature show that bank managers can reduce the size of loan loss provisions estimates to increase low profits (see Tran et al, 2020; Ozili and Outa, 2017; Danisman et al, 2021), and can overstate loan loss provisions to decrease high earnings (see, Ozili and Outa, 2017 for a review of the income smoothing literature). In the UK, the low interest environment combined with high level of competition among banks and high level of bank concentration may provide incentives for UK banks to smooth income over time. The presence of foreign banks in the UK may create additional competitive pressure on banks, thereby increasing the incentives to smooth income. As a result, bank managers be under pressure to report competitive earnings to satisfy shareholders by reporting profits that are relatively competitively and not too low or too high. Macroeconomic changes and institutional monitoring of banks in the form of fluctuating economic cycles, strong institutional governance and strict accounting disclosure rules may constrain the extent of income smoothing in the UK. Yet, the literature has not examined how institutional governance and macroeconomic factors affect the extent of income smoothing in the UK banking sector.

The UK has witnessed several developments in the banking sector and at the institutional level as shown in figure 1 and 2. For instance, in figure 1, the capital adequacy ratio of the UK banking sector increased by 54% since the 2008 global financial crisis up until 2017. Bank concentration declined by 18.2 per cent from 2008 to 2017. Bank nonperforming loans decreased from 2012 to 2017. Banking sector solvency increased by 252% from 2008 to 2017. These banking sector

developments show that the UK banking sector is strong and well capitalized. Furthermore, the UK institutional environment has witnessed major improvements as shown in figure 2. For instance, the control of corruption index has improved as well as the voice and accountability index since 2008, and suggests that the UK has effective institutions that monitor managerial behavior and protect bank clients such as the Financial Conduct Authority and the Financial Ombudsman. Also, banks in the UK are strictly regulated and supervised to ensure their activities and behavior do not put depositors' fund at risk or increase systemic risk to the financial system. UK regulators require banks to keep high regulatory capital ratios, and also require them to have capital buffers above the 8% Basel capital threshold. Furthermore, the UK adopts high-quality accounting disclosure standards such as IFRS in 2005 and IFRS 9 in 2014. Accounting disclosure standards are designed to discourage earnings management, improve earnings quality and increase the transparency of loan loss provisions estimates. These institutional monitoring developments in the UK should constrain UK bank managers from engaging in opportunistic earnings management or income smoothing practices. Yet, no study has examined the institutional determinants of bank income smoothing in the UK. This study investigates the determinants of bank income smoothing in the UK.



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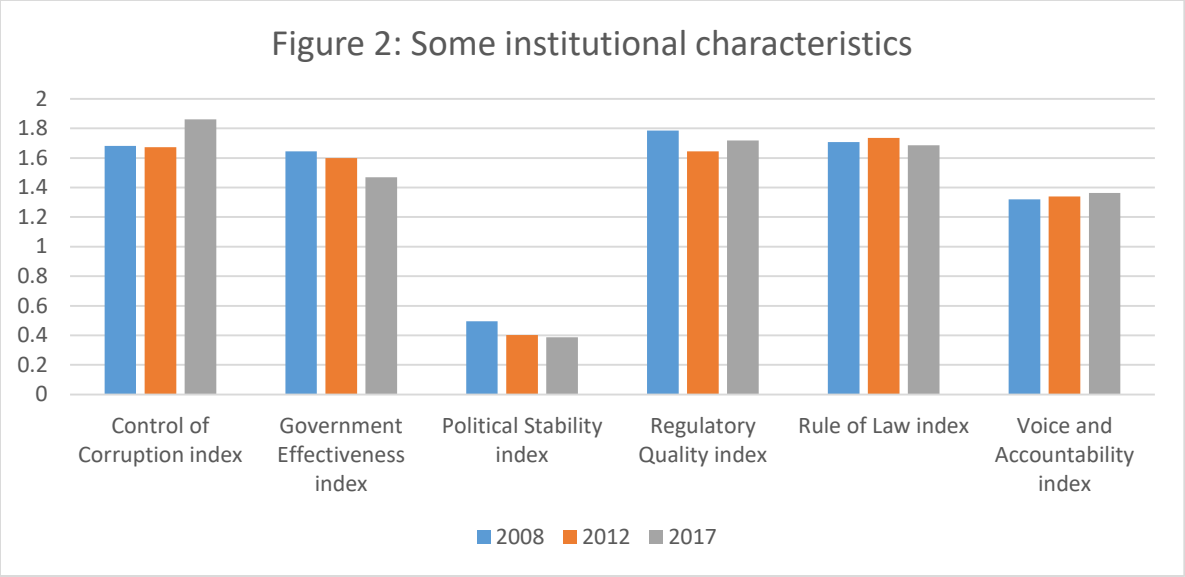

I predict and find strong empirical support for income smoothing using loan loss provisions among UK banks. The findings show that income smoothing is greater in times of high economic policy uncertainty. Interestingly, the extent of bank income smoothing using loan loss provisions is reduced by foreign bank presence, UK GAAP adoption, IFRS 9 adoption, and high levels of voice and accountability. Also, there is reduced income smoothing using loan loss provisions during a financial crisis and in periods of economic prosperity.

The study makes several contributions to the banking literature. First, this paper contributes to the literature that analyse bank income smoothing in a single country context. Single-country studies are scarce in the literature, and there is no study that examine institutional determinants of bank income smoothing in the UK context using country-level data. This study adds to the bank earnings management literature by documenting evidence for bank income smoothing using loan loss provisions in the UK context.

Secondly, this study contributes to the banking literature that examine the determinants of bank income smoothing. The findings of the study confirm that the propensity to use LLPs to smooth income is influenced by the quality of institutions (see, Ozili, 2019b). Thirdly, by controlling for accounting disclosure quality, the study contributes to the accounting literature that examine the

impact of IFRS, UK GAAP and IFRS 9 on banks' LLP and reported earnings. The findings are useful to both researchers, accounting standard setters and bank supervisors.

The rest of the paper is organized as follows. Section 2 presents the literature review and theory. Section 3 presents the research design. Section 4 discuss the results. Section 5 concludes.

2. Theory and Literature Review

2.1. Conceptual Framework and Theory

Income smoothing, or earnings smoothing, is the process of reducing the volatility of income over time so that income is never too high or too low (Ozili, 2017). Income smoothing is a common practice among firms. Firms have incentives to smooth income, such as the need to meet earnings expectation, the need to avoid debt covenant violation, and the need to preserve managers' job (Hemmer, 2020; Ozili and Outa, 2017). Firms may smooth income by deferring income to a future period or by accelerating future income to the current period. The techniques used to smooth income depends on the type of firm. Financial firms, such as banks, may use loan loss provisions or commission and fee income to smooth income. Loan loss provision is a common tool used by banks to smooth income. It involves increasing provisions when earnings are too high in order to reduce the size of reported earnings, and decreasing provisions when earnings are too low in order to increase the size of reported earnings (Ozili and Outa, 2017).

Early studies offer some theoretical explanations for income smoothing by firms. Lambert (1984) used agency theory to explain income smoothing. He argued that incentive problems caused by the unobservability of a manager's actions can lead to the manager selecting actions at the end of a period to smooth the period's income towards the expected income value. Also, the principal can predict what actions the manager will choose in response to any compensation scheme, and he takes this into consideration in deciding what compensation plan to offer. Therefore, the optimal compensation scheme offered by the principal causes the manager to smooth the firm's income. Acharya and Lambrecht (2015) show that income smoothing occurs because insiders have information about income that outside shareholders do not have. This information gives insiders the opportunity to

influence the size of reported earnings in order to meet outsiders' expectations about income. This results in reported income that is continually adjusted over time to meet a target or expectation.

2.2. Literature review

Recent studies investigate bank income smoothing in several cross-country contexts (e.g. Peterson and Arun 2018; Ozili, 2019b; Pinto et al, 2019; Ozili, 2019c; Ozili, 2018; Vasilakopoulos et al, 2018; Ozili, 2019a; Salem et al, 2021; Doan et al, 2020, etc.). Other studies examine bank income smoothing in a single country context (e.g. Abu-Serdaneh, 2018; Ozili and Outa, 2018; Danisman et al, 2021; Tran et al, 2020; Nikulin and Downing, 2021; Vishnani et al, 2019, etc.).

Among the multi-country studies, Peterson and Arun (2018) assess the difference in the income smoothing behavior of European systemic banks and non-systemic banks using European data. They find that European systemic banks exhibit greater income smoothing when they: (i) have substantial non-performing loans, (ii) are more profitable, (iii) meet/exceed minimum regulatory capital ratios, (iv) engage in forward-looking loan-loss provisioning and during recessionary periods. Ozili (2019b) investigates bank income smoothing in Africa, focusing on the effect of corruption on bank income smoothing. The study finds that African banks in corrupt environments smooth positive (non-negative) earnings as opposed to smoothing the entire profit distribution.

Pinto et al (2019) investigate the role of corporate governance mechanisms and foreign direct investment in restraining or encouraging income smoothing by African banks. They examine banks in 20 African countries from 2011 to 2017. They find that African banks use LLPs to reduce income volatility, and ownership concentration increases the extent of income smoothing. Ozili (2019c) examines the impact of the reclassification of International Accounting Standard (IAS) 39 on income smoothing among European banks. The author predicts that the strict recognition and re-classification requirements of IAS 139 reduced banks' ability to smooth income using bank securities and derivatives, motivating them to rely more on loan loss provisions to smooth income. The study did not find evidence to support the prediction for income smoothing through loan loss provisions. There was no evidence for income smoothing in the pre- and post-IAS 39 reclassification period.

Ozili (2019a), in a cross country study, investigates bank loan loss provisioning behavior during election years, and find evidence for greater income smoothing in election years. Vasilakopoulos

et al (2018) investigate the impact of governance mechanisms on the income smoothing behavior of banks in the European Union. They find evidence for income smoothing. They also find that the extent of income smoothing is influenced by board structure and the level of leverage. Ozili (2019d) investigates the relationship between discretionary loan loss provisions and bank intangibles among African banks, and find that income smoothing is reduced among banks that have large intangible asset investment, and for banks in environments with strong minority shareholder's right protection, while income smoothing is greater among African banks that have few intangible asset investments.

Salem et al (2021) examine the impact of audit quality on earnings management using loan loss provisions among conventional and Islamic banks operating in Middle East and North African (MENA) countries. They find that Big-4 auditor, audit committee size, and audit committee independence restrain earnings management among Islamic banks. In contrast, audit committee mechanisms do not reduce earnings management among conventional banks. Doan et al (2020) examine the relationship between government ownership and income smoothing of commercial banks. They find that banks with more state-controlled shareholders located in developing countries exhibit greater income smoothing.

Among the single country studies, Abu-Serdaneh (2018) investigates whether banks in Jordan use loan loss provisions to smooth income, manage capital ratio, or to signal future earnings. The study did not find evidence for income smoothing and capital management by Jordanian banks. Ozili and Outa (2018) examine the determinants of income smoothing using loan loss provisions by banks in South Africa. They find that income smoothing is reduced when South African banks are: under-capitalised, have large non-performing loans and have a moderate ownership concentration. On the other hand, income smoothing increases when South African banks are (i) more profitable during periods of economic prosperity, (ii) well-capitalised during boom years and (iii) when they adopt IFRS or use the services of a Big 4 auditor.

Danisman et al (2021) examine the effect of economic policy uncertainty on loan loss provisions for US banks. They examine 6384 US banks from 2009 to 2019, and find that U.S. banks use loan loss provisions for income smoothing purposes in times of high economic policy uncertainty. Tran et al (2020) compare the earnings management behaviour of public and private banks in the U.S. They find evidence for capital management but not for income smoothing. Nikulin and Downing

(2021) examine the use of LLP for earnings management and capital management before and after changes in banking regulation and oversight in Russia. They find that Russian banks use LLPs for earnings management both before and after the changes in regulation and oversight. Vishnani et al (2019) examine the case of India, and find evidence for income smoothing practices by Indian Banks.

Skala (2021) investigates the role of shareholders in the creation of discretionary loan loss provisions and the use of loan loss provisions for income smoothing among Central European banks. They find that foreign banks use loan loss provisions to smooth income while State banks do not use discretionary loan loss provisions to smooth income. Higher loan loss provisions are observed in foreign banks that have low asset quality and high profitability while foreign banks with low profitability that operate in volatile economic environments do not report higher discretionary loan loss provisions. Overall, there are few recent single country studies on bank income smoothing. The present study adds to the income smoothing literature by investigating the UK context.

3. Research design

3.1. Data source

Country data for the UK banking sector was collected from the World bank. Institutional, bank and macroeconomic data were collected from the World Bank's world governance indicators, global financial development indicators, and the world development indicators, respectively. The sample period is from 1999 to 2017. The dependent variable is loan loss provisions "LLP", and is derived using the approach of Ozili (2022). It is derived by multiplying the nonperforming loan to gross ratio (NPL) data with the loan loss coverage ratio[1] (LLC) data (see, section 3.4 for more explanation). Appendix 1 reports the source of data and variable description.

[1] LLC ratio is loan loss provisions divided by nonperforming loans.

3.2. Model formulation

In theory, income smoothing is partly a function of the instrument used to smooth income as shown in Peterson and Arun (2018), Ozili (2019a), Salem et al (2021), and Doan et al (2020). The literature identified loan loss provisions to be the most important tool used by banks to smooth income (Pinto et al, 2019; Ozili, 2019c; Ozili, 2018; Vasilakopoulos et al, 2018; Danisman et al, 2021). The bank income smoothing literature show that the model used to estimate the effect of loan loss provisions on income smoothing can be expressed as loan loss provisions is a function of its discretionary and non-discretionary determinants as shown in Peterson and Arun (2018), Ozili (2019a), Salem et al (2021), and Doan et al (2020).

LLP = f (discretionary determinants, non-discretionary determinants, control variables)

Accordingly, the functional form of the model used to estimate income smoothing expresses loan loss provisions as a function of its discretionary determinants (i.e., the EBTP and CAR variables), the non-discretionary determinants (i.e., the NPL and GDP variables) and other control variables. The variables of interest in the analysis is the income smoothing variable (EBTP) and the interaction effect of EBTP with the other variables.

3.3. Model specification

The model specification used in the study is a modified version of the models used in prior literature (see Pinto et al, 2019; Peterson & Arun, 2018; Fonseca and Gonzalez, 2008; Ozili, 2019a). The baseline model to estimate bank earnings management using loan loss provisions, is stated below:

$$LLPt = \beta 1EBTPt + \beta 2NPLt + \beta 3CARt + \beta 4GDPt + \beta 5INFt + \beta 6LNt + \beta 7CNt + e \dots\dots\dots\dots . equation\ (1)$$

After taking into account the income smoothing determinants, the model is specified below as:

$$LLPt = \beta 1EBTPt + \beta 2NPLt + \beta 3CARt + \beta 4GDPt + \beta 5INFt + \beta 6LNt + \beta 7CNt + \beta nDETERMINANTSt + e \dots\dots\dots\dots . equation\ (2)$$

Where, LLP = ratio of loan loss provisions to gross loans of the banking sector; NPL = ratio of nonperforming loans to gross loans of the banking sector; EBTP = the pre-managed earnings variable; CAR = ratio of total capital to total risk-weight assets; LN = market power; INF = inflation rate; CN = bank concentration; GDP = real gross domestic product growth rate; t = year.

3.4. Variable justification

The loan loss provisions ratio (LLP) is the dependent variable. The "LLP" variable is derived following the approach of Ozili (2022). It is derived by multiplying the nonperforming loan ratio (NPL) data with the loan loss coverage ratio (LLC) data as shown below. This simple arithmetic eliminates the NPL numerator from the NPL ratio and eliminates the NPL denominator from the LLC ratio, which gives the ratio of loan loss provisions to gross loan using the formula below:

$$LLP\ ratio\ =\ (nonperforming\ loans\ ratio)\ *\ (loan\ loss\ coverage\ ratio)$$

$$LLP\ /\ GL\ =\ (NPL\ /\ GL)\ *\ (LLP\ /\ NPL)$$

Where, nonperforming loan ratio (or NPL ratio) = nonperforming loans divided by gross loan; the loan loss coverage ratio (or LLC ratio) = actual amount of loan loss provisions divided by nonperforming loans.

The EBTP variable is the 'pre-managed earnings variable' or the income smoothing variable (see Pinto et al, 2019; Ozili, 2018). The EBTP variable is unobservable at the country level (Ozili, 2019b); therefore, a proxy variable was constructed using the return on asset (ROA). The return on assets ratio was adjusted by adding back loan loss provisions to the ROA ratio using the formular: EBTP = ROA * [(1+LLP)/100)]. The reason for constructing the adjusted ROA variable is to create a replica of the 'earnings before tax and provisions' variable which is commonly used in the bank income smoothing literature as shown in Pinto et al (2019), Ozili (2018), Vasilakopoulos et al (2018) and Ozili (2019b). These studies report a positive sign on the EBTP coefficient which indicate evidence for income smoothing using loan loss provisions (see Vasilakopoulos et al, 2018; Ozili, 2019b).

The nonperforming loan (NPL) variable takes into account bank provisioning in response to expected loan default. Previous studies, such as Ozili and Outa (2017), Peterson and Arun (2018) and Delis et al (2017), used the nonperforming loan variable to control for the effect of loan default

on bank provisions. These studies show that banks that expect high nonperforming loans will keep higher LLP (see Vasilakopoulos et al, 2018; Ozili, 2022), therefore, a positive sign for the NPL coefficient is predicted. This implies a positive relationship between LLP and NPL.

The CAR variable captures bank provisioning to manage regulatory capital ratio. Previous studies, such as Othman and Mersni (2014) and Peterson and Arun (2018), have used the CAR variable to control for the effect of capital requirements on the size of bank provisions. These two studies argue that banks with low capital use LLPs to boost their capital levels to avoid violating the minimum capital requirements set by bank regulators. Accordingly, a negative sign for the CAR coefficient is predicted. This implies a negative relationship between LLP and CAR.

The real gross domestic product growth rate (GDP) variable captures bank provisioning during fluctuating economic cycles. Previous studies, such as Ozili (2018) and El Sood (2012), have used the GDP variable to control for the effect of business cycle fluctuation on the size of bank provisions. These studies show that banks keep fewer provisions in periods of economic prosperity and higher provisions in times of recessions. This is because banks expect fewer loan defaults in good times, and higher loan defaults in bad times (Ozili, 2018; El Sood, 2012). Accordingly, a negative sign for the GDP coefficient is predicted. This implies a negative relationship between LLP and GDP.

The inflation (INF) variable captures bank provisioning during times of rising inflation. Previous studies, such as Skała (2015) and Andries et al (2017), take into account the effect of inflation on the size of bank loan loss provisions. These studies argue that banks tend to keep fewer LLP in times of high inflation in order to increase their profit levels. Following this argument, a negative sign for the INF coefficient is predicted. This implies a negative relationship between LLP and INF.

Lerner index (LN) variable measures the market power of banks. Previous studies, such as Ozili (2022) and Delis et al (2017), used the Lernex index to control for the impact of bank market power on the size of loan loss provisions. Ozili (2022) and Delis (2017) argue that banks with high market power usually have weak incentives to minimise credit risk. They are more likely to lend to high-risk borrowers (Delis et al, 2017), and such banks are more likely to keep fewer LLPs in order to increase their profit levels which will further reinforce their market power in the banking

industry. Accordingly, a negative relationship between LLP and LN is predicted. This implies a negative relationship between LLP and LN.

The CN variable measures bank concentration. Previous studies, such as Bouvatier et al (2014), suggest that high bank concentration leads to lower competition. Low competition will provide little or no incentive for banks to manipulate LLPs for income smoothing purposes, thereby, leading to fewer provisions. Thus, a negative relationship between LLP and CN is predicted, implying a negative relationship between LLP and CN. The summary of the apriori expectations is reported in table 1.

Table 1: Information about the variables and the predicted sign

Variable	Expected signs	Description
EBTP	+	Pre-managed earnings variable
CAR	-	Ratio of tier 1 capital to total risk-weight assets
NPL	+	Ratio of non-performing loan to gross loan
GDP	-	Real gross domestic product growth rate
INF	-	Inflation level
LN	-	Lerner index, a measure of market power
CN	-	Bank concentration

3.5. Estimation procedure

The model is estimated using ordinary least square (OLS) regression estimation. Several studies in the finance literature use OLS regression to estimate time series data. The model is estimated using ordinary least square (OLS) estimation after applying the Newey-West standard error test to correct for heteroscedasticity and autocorrelation in the standard errors.

3.6. Descriptive statistics

Table 2 reports the descriptive statistics for the main variables. Loan loss provision (LLP) is on average 1.24%. The average LLP is low compared to the average size of the nonperforming loan ratio (NPL) at 2.34%. EBTP is 5% while regulatory capital ratio (CAR) is above the 8% minimum capital requirement. Inflation rate (INF) is low at 1.98%. Economic growth (GDP) is positive at 1.97% which indicates positive economic growth in the UK. Bank concentration in the UK (CN) is moderate at 50%, and the market power of UK banks is low at 0.27.

Table 2: Descriptive statistics (main variables)								
Statistic	LLP (%)	EBTP (%)	CAR (%)	NPL (%)	GDP (%)	INF (%)	LN	CN
Mean	1.24	0.577	14.95	2.34	1.97	1.98	0.27	50.78
Median	1.41	0.481	13.20	2.50	2.35	1.96	0.27	54.43
Maximum	2.14	2.16	20.8	3.96	3.43	3.85	0.43	65.45
Minimum	0.41	-0.023	12.6	0.90	-4.24	0.36	0.052	29.44
Std. Dev.	0.5	0.59	2.69	1.07	1.73	0.84	0.12	11.23

4. Regression results

4.1. Income smoothing by UK banks: OLS regression result

The EBTP coefficient is positive and significant in column 1 of table 3. This indicates the presence of income smoothing among UK banks during the period examined. This result supports Bouvatier et al (2014), Peterson and Arun (2018), Doan et al (2020), and Ozili (2022). The result suggests that UK banks increase LLP to reduce high earnings, and decrease LLP to increase low earnings so that reported earnings are not too high or too low.

For the control variables, the NPL coefficient is significant and positively related to LLP as expected. This implies that UK banks increase LLP when they expect high nonperforming loans. The GDP coefficient is significant and negatively related to LLP as expected. This implies that UK banks increase LLP during economic downturns and decrease LLP during economic upturns. The CAR coefficient is significant and positively related to LLP. This implies that UK banks increase LLP when they have high regulatory capital ratio. The LN coefficient is significant and negatively related to LLP as expected. This implies that greater market power is associated with fewer LLP. The CN coefficient is significant and negatively related to LLP. This implies that greater bank concentration is associated with fewer LLP. The INF coefficient is insignificant.

Table 3: Bank income smoothing: earnings and economic incentives

Variables	coefficient (t-statistic)	coefficient (t-statistic)	coefficient (t-statistic)	coefficient (t-statistic)	coefficient (t-statistic)	coefficient (t-statistic)
EBTP	0.572*** (7.20)	14.372*** (7.94)	-0.043 (-0.07)	0.579*** (4.61)	0.121 (0.59)	3.894** (2.80)
CAR	0.001*** (4.66)	0.0002 (0.06)	0.001* (2.24)	0.001*** (4.66)	0.0005** (2.73)	0.0002 (0.39)
NPL	0.003** (2.34)	0.004*** (7.72)	0.003* (2.05)	0.003* (2.04)	0.005*** (6.22)	0.003** (3.98)
GDP	-0.001** (-2.86)	0.001*** (3.37)	-0.001 (-1.49)	-0.001* (-2.12)	-0.001*** (-5.72)	-0.0001 (-0.25)
INF	0.001 (0.72)	-0.0003 (-0.58)	0.001 (0.84)	0.001 (0.55)	-0.001** (-2.56)	-0.001 (-1.36)
LN	-0.021** (-2.86)	-0.010* (-2.41)	-0.019* (-2.14)	-0.022** (-2.54)	-0.006 (-0.91)	-0.005 (-0.49)
CN	-0.0001** (-2.77)	-0.0001*** (-9.46)	-0.0001** (-2.67)	-0.0001** (-2.49)	-0.0001*** (-2.97)	-0.0001** (-2.36)
BOOM		0.009** (2.54)				
BOOM*EBTP		-14.134*** (-7.56)				
POS			0.002 (0.56)			
POS*EBTP			0.551 (1.08)			
NEG				0.0002 (0.01)		
NEG*EBTP				-0.122 (-0.21)		
HIGH					0.005*** (6.72)	
HIGH*EBTP					0.040 (0.21)	
FG						0.0002* (2.15)
FG*EBTP						-0.068** (-2.60)
R-square	86.39	99.39	94.31	93.87	98.51	98.41
Adjusted R-square	80.22	98.58	86.70	85.68	96.51	95.86

The results in table 3 are estimated using the ordinary least square regression and applying the Newey-West (HAC) covariance estimator to correct for heteroscedasticity and autocorrelation (HAC). BOOM = a binary variable that equals 1 when ΔGDP is positive and zero otherwise, representing periods of economic boom. HIGH = binary variable equals 1 when EBTP is above-the-median EBTP and zero otherwise, representing periods when UK banks have substantial earnings. POS = binary variable equals 1 when EBTP is positive and zero otherwise, representing positive earnings. NEG = binary variable equals 1 when EPTP is negative and zero otherwise, representing losses. FG = foreign bank presence. T-statistics are reported in parenthesis. ***, **, * represent 1%, 5% and 10%.

4.2. Further analyses

4.2.1. Effect of earnings distribution, economic boom and foreign bank presence

In the literature, El Sood (2012) and Ozili and Outa (2018) show that banks have an incentive to smooth income in periods of economic prosperity to avoid reporting excess profit which may attract political and regulatory scrutiny into banks' earnings. Other studies, such as Skała (2015) and Ozili and Outa (2017), suggest that banks that expect high earnings prefer to report lower earnings by smoothing income in order to save for the rainy day. In this section, I test these expectations for the case of UK banks. I also test whether the presence of foreign banks can increase competition with domestic banks and encourage competitive income smoothing among banks in the UK banking industry. To do this, four binary variables were introduced, namely, BOOM, HIGH, POS and NEG. 'BOOM' is a binary variable that equals one when GDP is positive and zero otherwise, representing periods of economic boom. 'HIGH' is a binary variable that equals one when EBTP is above-the-median EBTP and zero otherwise, representing periods when UK banks have substantial or high earnings. 'POS' is a binary variable that equals one when EBTP is positive and zero otherwise, representing positive earnings. 'NEG' is a binary variable that equals one when EPTP is negative and zero otherwise, representing losses.

The results are reported in table 3. BOOM*EBTP coefficient is negative and significant. This implies that UK banks do not use LLP to smooth income during periods of economic prosperity. This result does not support Ozili and Outa (2018) who show that banks smooth income during times of economic prosperity. Regarding the earnings distribution, POS*EBTP, HIGH*EBTP and NEG*EBTP coefficients are insignificant. This indicates that positive earnings, substantial earnings and losses have an insignificant effect on the extent of income smoothing by UK banks. Regarding foreign bank presence, FN*EBTP coefficient is negative and significant. This indicates that foreign bank presence is inversely related to income smoothing. This implies that greater presence of foreign banks in the UK discouraged the use of LLP to smooth income.

4.2.2. Effect of accounting standards, banking crisis and the global financial crisis

In the literature, Ewert and Wagenhofer (2005), Alzoubi (2016) and Ozili and Outa (2018) show that the adoption of international accounting standards improves earnings quality and discourages earnings manipulation. Also, several studies show that bank income smoothing may be greater

during financial crises as it helps banks to avoid reporting significant losses during financial crises (e.g. Ewert and Wagenhofer, 2005; El Sood, 2012; Peterson and Arun, 2018). I test these expectations for the case of UK banks, to determine whether the adoption of IFRS improves earnings quality by discouraging income smoothing. I also test whether income smoothing is more pronounced before, during and after the global financial crisis. To do this, six binary variables were introduced, namely, IFRS, GAAP, IFRS9, BFC, DFC and PFC. 'IFRS' is a binary variable that equals 1 from 2005 to 2017, and zero otherwise, representing the adoption of IFRS standards in the UK in 2005. 'GAAP' is a binary variable that equals 1 from 1999 to 2004 and zero otherwise, representing the adoption of UK local GAAP in the pre-2005 period. 'IFRS9' is a binary variable that equals 1 from 2014 to 2017 and zero otherwise, representing the issuance of IFRS 9 expected-credit-loss (ECL) model. 'DFC' is a binary variable that equals 1 from 2007 to 2009 and zero otherwise, representing the financial crisis period; 'PFS' is a binary variable that equals 1 from 2010 to 2017 and zero otherwise, representing the post-financial crisis era. 'BFS' is a binary variable that equals 1 from 1996 to 2006 and zero otherwise, representing the pre-financial crisis era.

The result is reported in table 4. IFRS9*EBTP coefficient is negative and significant. This indicates that the implementation of IFRS9 is inversely related to the extent of income smoothing. This implies that adoption of IFRS 9's expected-credit-loss model discouraged the use of LLP to smooth income by UK bank, thereby increasing the quality of loan loss provisions estimates. Meanwhile, IFRS*EBTP coefficient is insignificant, and indicates that the implementation of IFRS beginning from 2005 in the UK did not have a significant effect on the extent of income smoothing by UK banks. GAAP*EBTP coefficient is negative and significant. This indicates that the adoption of UK local GAAP discouraged the use of LLP to smooth income by UK bank, thereby improving earnings quality. Also, DFC*EBTP coefficient is negative and significant. This indicates that income smoothing is absent during the global financial crisis. This result does not support the findings of El Sood (2012) who find evidence of income smoothing during the financial crisis for U.S. banks. In contrast, the result does not support Peterson and Arun (2018) who find evidence for income smoothing among European banks in the post-financial crisis period. The BFC*EBTP and PFC*EBTP coefficients are insignificant. This indicates that the extent of income smoothing by UK banks is not significantly affected by the pre- and post- financial crisis events.

Table 4: Bank income smoothing: effect of accounting disclosure standards and global financial crisis

Variables	coefficient (t-statistic)	coefficient (t-statistic)	coefficient (t-statistic)	coefficient (t-statistic)	coefficient (t-statistic)	coefficient (t-statistic)
EBTP	0.214* (2.42)	-0.015 (-0.06)	0.429*** (3.29)	0.339*** (3.86)	0.663* (2.24)	0.211** (2.75)
CAR	0.0002 (0.88)	0.001* (2.32)	0.001*** (9.69)	0.001* (2.05)	0.0004 (1.56)	0.001*** (5.48)
NPL	0.004*** (6.77)	0.003*** (3.71)	0.002** (3.05)	0.004*** (4.73)	0.005*** (3.97)	0.005*** (5.34)
GDP	0.00003 (0.18)	-0.0001 (-0.62)	-0.0002 (-1.17)	0.0002** (3.03)	-0.0004*** (-3.33)	-0.001*** (-6.36)
INF	-0.001 (-1.16)	-0.0003 (-0.29)	-0.001 (-0.82)	0.001 (0.80)	-0.001 (-0.92)	-0.001 (-1.57)
LN	0.005 (0.72)	0.003 (0.29)	-0.018** (-2.77)	-0.015** (-2.50)	-0.006 (-0.72)	-0.007* (-1.02)
CN	-0.0001** (-2.53)	-0.0001 (-0.94)	-0.0001** (-2.83)	-0.0001*** (-6.03)	-0.0001** (-2.86)	-0.0001** (-2.05)
GAAP	0.011*** (5.82)					
GAAP*EBTP	-0.546*** (-5.61)					
IFRS		-0.010** (-2.94)				
IFRS*EBTP		0.321 (1.12)				
IFRS9			0.002 (0.23)			
IFRS9*EBTP			-3.238** (-2.98)			
DFC				0.019*** (5.11)		
DFC*EBTP				-2.476*** (-4.82)		
BFC					0.006** (3.43)	
BFC*EBTP					-0.525 (-1.88)	
PFC						-0.007*** (-5.65)
PFC*EBTP						-0.129 (-0.48)
R-square	99.17	97.18	97.15	98.58	97.51	97.67
Adjusted R-square	98.07	93.42	93.35	96.69	94.19	94.56

The results in table 4 are estimated using the ordinary least square regression and applying the Newey-West (HAC) covariance estimator to correct for heteroscedasticity and autocorrelation (HAC). IFRS = binary variable representing the adoption of IFRS standard in 2005; GAAP = binary variable representing the adoption of UK local GAAP in the pre-2005 period. IFRS9 = binary variable representing the adoption of excepted credit loss (ECL) model; DFC = binary variable representing the financial crisis period; PFS = post-financial crisis binary variable. BFS = pre-financial crisis binary variable. T-statistics are reported in parenthesis. ***, **, * represent 1%, 5% and 10%.

4.2.3. Institutional governance determinants

In the literature, An et al (2016), Jiang et al (2018) and Ozili (2019b) argue and show evidence that strong institutional governance can constrain bank managers from engaging in earnings management. Accordingly, I test this observation for the case of UK banks, to determine whether the presence of strong institutional governance discourages income smoothing among UK banks. Five institutional governance variables used in Ozili (2019b) were introduced, and interacted with the EBTP variable. The institutional governance variables are the voice and accountability index (VA), the government effectiveness index (GE), the regulatory quality index (RQ), the rule of law index (LAW), and the control of corruption index (CC).

The result is reported in table 5. The VA*EBTP coefficient is negative and significant. This indicates that voice and accountability is inversely related to bank income smoothing. This implies that high institutional accountability in the UK discouraged the use of LLP to smooth income by UK bank. This result supports the findings of An et al (2016) and Jiang et al (2018). However, GE*EBTP, RQ*EBTP, LAW*EBTP and CC*EBTP coefficients are insignificant. This indicates that government effectiveness, regulatory quality, rule of law and corruption control have an insignificant effect on the extent of income smoothing by UK banks.

Table 5: Bank income smoothing: institutional determinants

Variable	coefficient (t-statistic)	coefficient (t-statistic)	coefficient (t-statistic)	coefficient (t-statistic)	coefficient (t-statistic)
EBTP	2.461***	0.850	1.030	-1.187	0.248
	(17.05)	(0.38)	(1.59)	(-0.90)	(0.19)
CAR	-0.0001	-0.0001	-0.0001	-0.0001	0.0002
	(-0.002)	(-0.19)	(-0.13)	(-0.23)	(-0.94)
NPL	0.004***	0.004***	0.004***	0.004**	0.004***
	(6.58)	(3.73)	(8.18)	(5.74)	(4.52)
GDP	-0.0003	-0.0002	-0.0004**	-0.0001	-0.0002
	(-1.76)	(-1.31)	(-2.88)	(-0.51)	(-1.88)
INF	-0.001	-0.0007	-0.001	-0.001	-0.001
	(-1.86)	(-0.88)	(-0.98)	(-1.01)	(-1.35)
LN	-0.004	-0.008	-0.012**	-0.003	-0.012**
	(-0.84)	(-1.49)	(-2.99)	(-0.54)	(-3.10)
CN	-0.0002***	-0.0001**	-0.0001***	-0.0001**	-0.0001***
	(-9.02)	(-3.62)	(-4.09)	(-2.99)	(-4.06)
VA	0.008***				
	(4.23)				
VA*EBTP	-1.507***				
	(-11.32)				
GE		0.007**			
		(2.90)			
GE*EBTP		-0.354			
		(-0.28)			
RQ			0.008**		
			(2.91)		
RQ*EBTP			-0.403		
			(-0.92)		
CC				0.006**	
				(3.09)	
CC*EBTP				0.728	
				(1.08)	
LAW					0.008***
					(5.09)
LAW*EBTP					0.076
					(0.09)
R-square	98.72	98.12	98.93	98.53	0.99
Adjusted R-square	97.02	95.63	97.52	96.58	0.97

The results in table 5 are estimated using the ordinary least square regression and applying the Newey-West (HAC) covariance estimator to correct for heteroscedasticity and autocorrelation (HAC). CC = control of corruption index; GE = government effectiveness index; PS = political stability and absence of violence/terrorism index; RQ = regulatory quality index; LAW = rule of law index; VA = voice and accountability index. T-statistics are reported in parenthesis. ***, **, * represent 1%, 5% and 10%.

4.2.4. Effect of economic policy uncertainty and risk

In the banking literature, Danisman et al (2021), and Hu and Gong (2019) suggest that banks will respond to high economic policy uncertainty by increasing the interest rate on loans and decrease lending, thereby affecting bank performance**.** Also, Shim (2013) and Lepetit and Strobel (2015) show that high insolvency risk and low bank capital buffer can increase risk in the banking sector. Therefore, I test whether economic policy uncertainty, bank capital buffers and insolvency risk have any effect on income smoothing by UK banks.

The result is reported in table 6. EPU*EBTP coefficient is positive and significant. This indicates that higher economic policy uncertainty is significantly related to greater income smoothing by UK banks. This implies that UK banks use LLP to smooth income during periods of high economic policy uncertainty. This finding supports the findings of Danisman et al (2021) who find that U.S. banks use loan loss provisions to smooth income in times of economic policy uncertainty. Also, the ZSCORE*EBTP, CB*EBTP and SL*EBTP coefficients are insignificant. This indicates that the extent of income smoothing by UK banks is not significantly affected by insolvency risk, bank capital buffers and syndicated loan issuance.

Table 6: Bank income smoothing: effect of economic policy uncertainty and risk

Variable	coefficient (t-statistic)	coefficient (t-statistic)	coefficient (t-statistic)	coefficient (t-statistic)
EBTP	0.031	0.407	0.089	0.762
	(0.15)	(0.89)	(0.27)	(1.64)
CAR	0.001*	0.0001	0.002***	0.001
	(2.13)	(0.07)	(7.46)	(1.07)
NPL	0.005**	0.005*	0.004***	0.004**
	(3.09)	(2.39)	(5.44)	(3.84)
GDP	-0.001**	-0.0002	-0.0001	-0.001***
	(-2.78)	(-0.75)	(-0.32)	(-4.87)
INF	0.0001	-0.0004	-0.001	-0.00002
	(0.05)	(-0.22)	(-1.45)	(-0.15)
LN	-0.007	0.002	-0.009*	-0.019**
	(-0.57)	(0.12)	(-2.07)	(-3.79)
CN	-0.0001*	-0.0001**	-0.0001***	-0.0001
	(-2.20)	(-2.46)	(-3.53)	(-0.81)
EPU	0.0001			
	(-1.89)			
EPU*EBTP	0.009**			
	(2.42)			
ZSCORE		0.001		
		(0.84)		
ZSCORE*EBTP		-0.007		
		(-0.11)		
CB			-0.002**	
			(-3.56)	
CB*EBTP			0.038	
			(0.66)	
SL				0.001
				(1.57)
SL*EBTP				-0.043
				(-0.65)
R-square	95.94	95.42	98.15	97.87
Adjusted R-square	90.53	89.30	95.69	94.46

The results in table 6 are estimated using the ordinary least square regression and applying the Newey-West (HAC) covariance estimator to correct for heteroscedasticity and autocorrelation (HAC). EPU = represent the economic policy uncertainty index December year end values. ZSCORE = insolvency risk. CB = bank capital buffer. SL = syndicated loan issuance. T-statistics are reported in parenthesis. ***, **, * represent 1%, 5% and 10%.

5. Conclusion

This paper examined the determinants of bank income smoothing using loan loss provisions in the United Kingdom. Several income smoothing determinants were analyzed. The findings showed that UK banks use loan loss provision for income smoothing purposes. Income smoothing is greater in times of high economic policy uncertainty. The extent of bank income smoothing using loan loss provisions is reduced by foreign bank presence, UK GAAP adoption, IFRS9 adoption, and high levels of voice and accountability. Also, there is reduced income smoothing using loan loss provisions during financial crisis and in periods of economic prosperity.

The implication of the findings is that institutional governance, accounting disclosure rules and certain economic conditions play a role in constraining the use of loan loss provisions for income smoothing purposes in the UK banking sector. The finding showed that good institutions can help to improve earnings quality. Policy makers in the United Kingdom should strengthen the governance and quality of UK institutions in order to improve earnings quality for investors who rely on earnings to make investment decisions.

One limitation of the study is that it used industry data for UK banks rather than individual bank data which could have allowed for micro analyses of UK banks. Future research can re-examine the determinants of bank income smoothing in the UK using individual bank data. Future research can also examine other determinants of bank income smoothing in the United Kingdom that were not examined in this study. Future research can also examine the determinants of bank income smoothing in other country contexts, and determine whether the differences in income smoothing are driven by country-specific differences.

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Appendix 1

Appendix 1. Variable description and sources

EBTP	Earnings before provisions and tax variable	World Bank database
CAR	Regulatory capital ratio: total capital to risk-weighted assets ratio	World Bank database
NPL	Nonperforming loan to gross loan	World Bank database
GDP	Real GDP growth	World Bank database
INF	Inflation rate	World Bank database
LN	Lerner index	World Bank database
CN	Bank concentration	World Bank database
BOOM	Binary variable representing periods of economic boom	Author
HIGH	Binary variable representing substantial earnings	Author
POS	Binary variable representing positive earnings	Author
NEG	Binary variable representing losses or negative earnings	Author
FG	Foreign bank presence, measured as the number of foreign banks to total banks	World Bank database
GAAP	Binary variable representing the adoption of UK GAAP	Author
IFRS	Binary variable representing the adoption of IFRS	Author
IFRS9	Binary variable representing the adoption of the expected credit loss model	Author
DFC	Binary variable representing the global financial crisis period (including the immediate aftershocks) from 2007 to 2009	Author
BFC	Binary variable representing the pre-financial crisis period	Author
PFC	Binary variable representing the post-crisis period	Author
CC	Control of corruption index	World Bank database
GE	Government effectiveness index	World Bank database
RQ	Regulatory quality index	World Bank database
PS	Political stability and absence of violence/terrorism index	World Bank database
LAW	Rule of law index	World Bank database
CB	Bank capital buffer	World Bank database
SL	Syndicated loan issuance	World Bank database
ZSCORE	Insolvency risk of the banking sector	World Bank database
EPU	Economic policy uncertainty index December year end values.	World Bank database