Bank loan loss provisions determinants in non-crisis years: evidence from African, European, and Asian countries

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Abstract

Loan loss provision is an important accounting number in the banking sector. This study investigates the determinants of loan loss provisions in non-crisis years in 28 countries from 2011 to 2018. The countries consist of African, European, and Asian countries. Using the generalized linear model regression and the quantile regression methodology, the results show that institutional quality is a significant determinant of bank loan loss provisions, indicating that the presence of strong institutions decrease the size of bank loan loss provisions. In the regional analyses, it was found that economic growth is a significant determinant of bank loan loss provisions in African and Asian countries. Loan loss provisions are higher in times of economic prosperity in African and Asian countries. This might be due to counter-cyclical provisioning which require African and Asian banks to keep higher loan loss provisions in good economic times so that the high provisions that was set aside in good times could be used as a safety buffer during times of economic downturns in African countries. Bank overhead cost is also a significant determinant of bank loan loss provisions only in Asian countries.

Keywords: financial reporting, accruals, loan loss provisions, banks, income smoothing, earnings management, noninterest income, overhead costs, institutional quality.

JEL codes: M41, M42, M48, G21.

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1. Introduction

This study examines the determinants of loan loss provisions in non-crisis years.

Loan loss provision is an important accounting number. Loan loss provision is the amount of money that a bank must set aside to cover expected losses in their loan portfolio (Danisman et al, 2021). Loan loss provision is the most significant and important accruals in the banking sector (Bushman and Williams, 2012). Loan loss provision is important to accounting standard setters because overstated loan loss provision affects the transparency of accounting numbers and decreases financial reporting quality and earnings quality (Nicoletti, 2018). Loan loss provision is also important to bank regulators and bank supervisors because understated loan loss provision can increase bank fragility (Nicoletti, 2018). Therefore, there is much attention on bank loan loss provision from accounting standard setters and bank supervisors.

A growing literature investigates the determinants of bank loan loss provisions. The literature has identified several loan loss provisions determinants such as loan charge off (Basu, 2020), nonperforming loans (Biswas et al, 2024), capital adequacy ratio (Mnif and Slimi, 2023), accounting regulation (Kilic et al, 2013), economic policy uncertainty (Ng et al, 2020; Danisman et al, 2021), election cycles (Ozili, 2020), and bank lending (Setiyono, 2024). But the literature has little or no attention to non-traditional determinants that may also influence the size of loan loss provisions, and there is little knowledge on how these non-traditional determinants might affect loan loss provisions in good years or in non-crisis years. Understanding how non-traditional determinants affect bank loan loss provisions is important because it can reveal other important factors that influence loan loss provisions which have remained unknown in the literature and for which policy makers need to be more attention to.

The study examines the influence of three non-traditional determinants on bank loan loss provisions particularly non-interest income, bank overhead costs, and institutional governance factors. Regarding non-interest income, it is argued that banks that anticipate a decline in non-interest income will decrease their loan loss provisions in order to boost their interest income. Banks will do this as a way to augment any shortfall in profit levels. It is also argued that banks that have high overhead costs will seek to decrease their loan loss provisions in order to preserve or increase their earnings. It is further argued that the

presence of strong institutions is beneficial for banks because strong institutions may create the legal and institutional frameworks that compel debtors to repay their debt or face legal consequences. Such frameworks will help banks in loan recovery which helps to decrease the loan default rate and decrease the size of loan loss provisions.

In this paper, I extend the literature by examining some non-traditional determinants of bank loan loss provisions, and examining these determinants in non-crisis years to determine their effect on banking sector loan loss provisions. I also examine the effect of the non-traditional determinants on bank loan loss provisions along regional dimensions. In the empirical analysis, annual data from 2011 to 2018 were used, and the findings reveal that institutional quality is a significant determinant of bank loan loss provisions. Also, economic growth is a significant determinant of bank loan loss provisions in African and Asian countries while bank overhead cost is a significant determinant of bank loan loss provisions in Asian countries.

This study makes two important contributions to the literature. First, it contributes to the recent literature on the non-traditional determinants of bank loan loss provisions. Prior studies examined some non-traditional determinants of loan loss provision (see, for, example, Basu, 2020; Biswas et al, 2024; Mnif and Slimi, 2023; Kilic et al, 2013; Ng et al, 2020; Danisman et al, 2021; Ozili, 2020; Setiyono, 2024). The present study complements these studies by examining other non-traditional determinants of loan loss provisions which have not been examined in the previous literature. Two, the study contributes to the banking literature that investigates the determinants of LLPs under unique conditions. The present study contributes to this literature by examining the determinants of LLPs under non-crisis years.

The rest of the study is structed as follows. Section 2 presents the literature review. Section 3 presents the methodology. Section 4 presents the empirical results. Section 5 presents the conclusion of the study.

2. Literature review

The existing literature examined some determinants of loan loss provisions, but the literature has not considered non-interest income, bank overhead costs and institutional quality to be determinants of bank loan loss provisions. For instance, Luu et al (2023) considered organizational culture to be a determinant of bank loan loss provisions. Luu et al (2023) were interested in whether banks with different organizational cultures adjust their loan loss provisions in response to industry competition following the passage of the US Interstate Banking and Branching Efficiency Act (IBBEA) of 1994. They examined US banks that have four different organizational cultures: a control-dominant culture, collaborate-dominant culture, compete-dominant culture, or a create-dominant culture. They found that banks that have a collaborate-dominant organizational culture are less likely to exercise discretion over LLPs. In contrast, banks with compete- and create-dominant organizational cultures are more likely to exercise their discretion over LLPs. They also found that banks that have a collaborate-dominant organizational culture exhibit less income smoothing.

Ren et al (2023) considered fluctuating economic growth target to be a determinant of bank loan loss provisions. Ren et al (2023) examined how fluctuations in economic growth targets affect bank loan loss provisions. They found that banks in prefecture-level cities that have higher economic growth target keep more LLPs in order to deal with potential loan losses. Ozili and Arun (2023) considered foreign bank presence, bank ownership and institutional quality to be determinants of bank loan loss provisions. Ozili and Arun (2023) investigate the determinants of bank income smoothing using loan loss provisions. The author examined whether 370 African banks use loan loss provisions to smooth income and whether this behaviour is influenced by foreign bank presence, ownership, and institutional quality differences across African countries. The author found that African banks use LLPs to smooth their income and income smoothing is persistent (i) among banks that have a widely dispersed ownership, (ii) among banks that have strong government ownership and (iii) among banks that have weak government ownership.

Ng et al (2020) considered economic policy uncertainty to be a determinant of bank loan loss provisions. Ng et al (2020) examined the effect of economic policy uncertainty on bank loan loss provisions. They found that banks signal more expected loan losses during times of high

economic policy uncertainty. Ozili (2023) considered the global financial crisis to be a determinant of bank loan loss provisions. Ozili (2023) investigated whether banks use LLPs for earnings management purposes. The study examined four countries: UK, France, South Africa, and Egypt, and found that bank income smoothing is present in the UK and Egypt and absent in France and South Africa. It was also found that banks in Egypt used LLPs to smooth income before the global financial crisis while bank income smoothing is pronounced in France during and after the financial crisis. Degryse and Huylebroek (2023) considered government's fiscal support to be a determinant of bank loan loss provisions. Degryse and Huylebroek (2023) were interested in the response of bank loan loss provisions to governments' fiscal support in 37 different countries during the COVID-19 pandemic. The sample period examined was from 2016 to 2021. The authors breakdown government's fiscal support into two components: direct support which includes cash transfers, tax reliefs, and tax deferrals, and liquidity support which includes government-backed loans and equity injections. They found that fiscal support in terms of direct support led to a decrease in bank loan loss provisions while fiscal support in terms of liquidity support did not decrease bank loan loss provisions.

Biswas et al (2024) considered trade openness to be a determinant of bank loan loss provisions. Biswas et al (2024) investigate whether trade openness affects how banks use to loan loss provisions to smooth earnings and how adopting the International Financial Reporting Standards (IFRS) helps to mitigate earnings smoothing. They examined 78 commercial banks in Brazil, Russia, India, China and South Africa (BRICS) countries from 2014 to 2020 and found that trade openness lead BRICs commercial banks to engage in income smoothing using LLPs while the adoption of IFRS decreased income smoothing among banks that operate in countries that have better institutional environment. Basu et al (2020) considered loan charge-offs to be a determinant of bank loan loss provisions. Basu et al (2020) examined whether large net loan charge-offs lead to lower nonperforming loans and higher loan loss provisions. They found that bank LLPs have a V-shaped relation with changes in nonperforming loans, and net loan charge-off was a contributing factor to the V-shaped relationship. They also found that loan loss provisions are more sensitive to increase in nonperforming loans.

Mnif and Slimi (2023) considered auditor's characteristics to be a determinant of bank loan loss provisions. Mnif and Slimi (2023) examined how auditor's characteristics affect earnings management using loan loss provisions by African banks. They examined 14 African countries from 2011 to 2016 and used discretionary LLP as a proxy for earnings management. They found that auditor's industry specialization and tenure have a negative impact on earnings management using loan loss provisions. They show that higher total fees paid to the bank auditor leads to higher earnings management. The authors also find that industry specialist auditors are more effective in reducing the incoming-increasing earnings management. Kilic et al (2013) considered accounting regulation to be a determinant of bank loan loss provisions. Kilic et al (2013) investigate the effect of SFAS 133 - Accounting for Derivative Instruments and Hedging Activities regulation – on the income smoothing behaviour of US banks using loan loss provisions. They found that the adoption of the SFAS 133 regulation decreased banks' ability to smooth income through derivatives, and it led banks to smooth income using loan loss provisions to smooth income.

Overall the previous show that organizational culture (Luu et al, 2023), economic growth target (Ren et al, 2023), ownership structure (Ozili and Arun, 2023), economic policy uncertainty (Ng et al, 2020), the global financial crisis (Ozili, 2023), government's fiscal support (Degryse and Huylebroek, 2023), trade openness (Biswas et al, 2024), loan charge-off (Basu et al, 2020), auditor's characteristics (Mnif and Slimi, 2023), and accounting regulation (Kilic et al, 2013). But the previous literature has not considered non-interest income, bank overhead costs and institutional quality to be determinants of bank loan loss provisions. The present study fills this gap in the literature by examining additional non-traditional determinants of bank loan loss provisions and examining these determinants in non-crisis years to determine their effect on banking sector loan loss provisions. This study also examine the effect of the non-traditional determinants on bank loan loss provisions along regional dimensions.

3. Methodology

3.1. The sample

The study used data obtained from 28 countries which include Argentina, Brazil, Cambodia, Cameroun, China, Democratic Republic of Congo, Cote d'Ivoire, Egypt, Georgia, Ghana, India, Indonesia, Japan, Kenya, Korea Republic, Malaysia, Mexico, Netherlands, Nigeria, Pakistan, Philippines, Russia, Singapore, Tanzania, Thailand, United Kingdom, United States and Vietnam. The data were obtained from the world bank's global financial development indicators (GFDI), the world development indicators (WDI) and the world governance indicators (WGI) database for an 8-year period from 2011 to 2018 (see table 1 for variable description and source). The sample period covers only the non-crisis years. This means that the sample excludes the pre-2010 years which were affected by the global financial crisis and the aftershocks as well as the post 2019 years which were affected by the COVID-19 pandemic event.

Table 1. Description and source of the variables used in the study				
Variable	Indicator name	Description	Source	Expected sign
LLP	Loan loss provisions to gross loans ratio (%)	It is a ratio of total loan loss provisions to total loans in bank portfolio	GFDI	
CAR	Bank regulatory capital to risk-weighted assets (%)	It is a ratio of total regulatory capital to its assets held, weighted according to risk of those assets.	GFDI	-
NII	Bank noninterest income to total income (%)	Bank's income that has been generated by noninterest related activities as a percentage of total income (net-interest income plus noninterest income).	GFDI	+
NPL	Bank nonperforming loans to gross loans (%)	Ratio of defaulting loans (payments of interest and principal past due by 90 days or more) to total gross loans (total value of loan portfolio)	GFDI	+
GDPR	Economic growth	Annual change in gross domestic product, in percentage	WDI	-
ISI	Institutional quality	The simple average of the six of the world governance indicators: voice and accountability index; political stability and absence of violence/terrorism index; government effectiveness index; regulatory quality index; rule of law index; control of corruption index.	WGI	-
COST	Bank overhead costs to total assets	Measured as (%). Operating expenses of a bank as a share of the value of all assets held.	GFDI	-

3.2. Model specification and estimation techniques

Four models were used in the study. The models are a variation of the model used in Luu et al (2023), Ren et al (2023) and Ozili and Arun (2023). The first model, Eq1, estimates the determinants of bank loan loss provisions in the full sample. The second model, Eq2, estimates the determinants of bank loan loss provisions in African countries. The third model, Eq3, estimates the determinants of bank loan loss provisions in European countries. The fourth model, Eq4, estimates the determinants of bank loan loss provisions in Asian countries.

In the model, the LLP variable is the dependent variable. The CAR variable is the regulatory capital ratio. The NII variable is the non-interest income ratio of banks. The NPL variable is the nonperforming loan to gross loan ratio. The GDPR variable is the annual rate of growth in real

gross domestic product. The ISI variable measures institutional quality. The COST variable is the overhead cost of banks. ε is the error term while i,t is the subscript for time and year. The AFR variable is the binary variable representing the African countries in the sample. The EUR variable is the binary variable representing the European countries in the sample. The ASN variable is the binary variable representing the Asian countries in the sample.

Regarding the estimation techniques, the model is estimated using the generalized linear model (GLM) regression. The GLM regression estimation is used to account for the potential nonlinearity between the response variable and predictors through a link function and when the response variable is not normally distributed (Thompson and Baker, 1981). The study also used the quantile regression method as a robustness test. The quantile regression is used because it is less affected by outliers in the data, and it makes no assumptions about the distribution of the target variable (Koenker, 2005).

$$LLPi,t = \beta 0 + \beta 1CARi,t + \beta 2NIIi,t + \beta 3NPLi,t + \beta 4GDPRi,t + \beta 5ISIi,t + \beta 6COSTi,t + \varepsilon \ldots Eq1$$

$$LLPi,t = \beta 0 + \beta 1CARi,t + \beta 2NIIi,t + \beta 3NPLi,t + \beta 4GDPRi,t + \beta 5ISIi,t + \beta 6COSTi,t + \beta 7AFRi,t + \beta 8AFR * CARi,t + \beta 9AFR * NIIi,t + \beta 10AFR * NPLi,t + \beta 11AFR * GDPRi,t + \beta 12AFR * ISIi,t + \beta 13AFR * COSTi,t \ldots..Eq2$$

$$LLPi,t = \beta 0 + \beta 1CARi,t + \beta 2NIIi,t + \beta 3NPLi,t + \beta 4GDPRi,t + \beta 5ISIi,t + \beta 6COSTi,t + \beta 7EURi,t + \beta 8EUR * CARi,t + \beta 9EUR * NIIi,t + \beta 10EUR * NPLi,t + \beta 11EUR * GDPRi,t + \beta 12EUR * ISIi,t + \beta 13EUR * COSTi,t \ldots..Eq3$$

$$LLPi,t = \beta 0 + \beta 1CARi,t + \beta 2NIIi,t + \beta 3NPLi,t + \beta 4GDPRi,t + \beta 5ISIi,t + \beta 6COSTi,t + \beta 7ASNi,t + \beta 8ASN * CARi,t + \beta 9ASN * NIIi,t + \beta 10ASN * NPLi,t + \beta 11ASN * GDPRi,t + \beta 12ASN * ISIi,t + \beta 13ASN * COSTi,t \ldots..Eq4$$

3.3. Justifying the variables included in the model

The LLP variable is the dependent variable. It is measured as loan loss provisions divided by gross loans, and it is the most significant accruals in the banking sector (Mahieux et al, 2023; Ozili, 2023). The CAR variable is the regulatory capital ratio. The literature show that banks with low regulatory capital ratios will increase loan loss provisions to compensate for their low regulatory capital levels (Luu et al, 2023). This implies a negative relationship between the regulatory capital ratio and bank loan loss provisions. The NII variable is the non-interest income ratio of banks. Banks that anticipate a low level of non-interest income will decrease their loan loss provisions in order to boost their interest income and as a way to augment any shortfall in profit levels (Conti et al, 2023; Ozili, 2017). Therefore, a positive relationship between non-interest income and bank loan loss provision is expected. The NPL variable is the nonperforming loan to gross loan ratio. The literature show that banks will increase the size of loan loss provisions when they expect rising loan default rates (Degryse and Huylebroek, 2023). This implies a positive relationship between nonperforming loans and bank loan loss provisions. The GDPR variable is the annual rate of growth in real gross domestic product. Generally, banks will keep higher loan loss provisions during bad economic times and keep fewer loan loss provisions in periods of economic prosperity (Ozili and Arun, 2023). This signals procyclical loan loss provisioning, and it implies a negative relationship between economic growth and bank loan loss provisions. The ISI variable measures institutional quality. High institutional quality, or the presence of strong institutions, is beneficial for banks because strong institutions create the legal and institutional frameworks that compel debtors to repay their debt or face legal consequences. Such frameworks will help banks in loan recovery, thereby reducing loan defaults and reducing the size of loan loss provisions (Kanagaretnam et al, 2014; Ozili and Outa, 2017). This implies a negative relationship between institutional quality and bank loan loss provisions. The COST variable is the overhead cost of banks. It is expected that banks that have high overhead costs will seek to decrease their loan loss provisions in order to preserve or increase their earnings (Ozili and Arun, 2023). This implies a negative relationship between institutional quality and bank loan loss provisions. The AFR, EUR and ASN binary variables were introduced into the model. AFR binary variable is equal to one if the country is an African country and it is zero if the country is not an African country. EUR binary variable is equal to one if the country is a European

country and it is zero if the country is not a European country. ASN binary variable is equal to one if the country is an Asian country and it is zero if the country is not an Asian country. These three binary variables are interacted with each determinants to determine the effect on bank loan loss provisions in each region. The analysis is reported in sections 4.3, 4.4 and 4.5, and in tables 3 and 4.

4. Empirical result

This section presents the empirical results. It presents the correlation results. Thereafter, it presents the baseline results, the regional results and the robustness test results.

4.1. Correlation analysis

The Pearson correlation result, reported in table 2, shows that the LLP variable is significant and positively correlated with the NII, NPL and COST variables. This correlation result indicates that high levels of non-interest income, nonperforming loans and overhead costs are significantly correlated with higher bank loan loss provisions. It also shows that the AFR variable is significant, and positively correlated with the LLP variables which suggests that LLP is higher in African countries. In contrast, the LLP variable is significant and negatively correlated with the CAR, GDPR and ISI variables in table 2. This correlation result indicates that high levels of regulatory capital ratio, positive economic growth and institutional quality are significantly correlated with fewer bank loan loss provisions. It also shows that the ASN and EUR variables are significant, and negatively correlated with the LLP variables which suggests that LLP is fewer in Asian and European countries.

Table 2. Pearson correlation matrix for the variables

Variable	LLP	CAR	NII	NPL	GDPR	ISI	COST	AFR	ASN	EUR
LLP	1.000									

CAR	-0.281***	1.000								
	(0.00)	-----								
NII	0.131*	-0.125*	1.000							
	(0.08)	(0.09)	-----							
NPL	0.121*	-0.180**	0.060	1.000						
	(0.10)	(0.01)	(0.42)	-----						
GDPR	-0.162**	0.085	-0.447***	0.025	1.000					
	(0.02)	(0.25)	(0.00)	(0.73)	-----					
ISI	-0.250***	0.201***	0.161**	-0.412***	-0.156**	1.000				
	(0.00)	(0.00)	(0.03)	(0.00)	(0.03)	-----				
COST	0.133*	0.017	0.489***	0.355***	-0.122*	-0.294***	1.000			
	(0.07)	(0.82)	(0.00)	(0.00)	(0.10)	(0.00)	-----			
AFR	0.006	-0.012	-0.003	0.644***	0.097	-0.378***	0.362***	1.000		
	(0.92)	(0.87)	(0.96)	(0.00)	(0.19)	(0.00)	(0.00)	-----		
ASN	-0.342***	0.006	-0.426***	-0.534***	0.397***	0.132*	-0.553***	-0.511***	1.000	
	(0.00)	(0.92)	(0.00)	(0.00)	(0.00)	(0.07)	(0.00)	(0.00)	-----	
EUR	-0.168**	0.035	0.374***	-0.042	-0.246***	0.404***	0.223***	-0.226***	-0.346***	1.000
	(0.02)	(0.63)	(0.00)	(0.57)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	-----

***, **, * represent statistical significance at the 1%, 5% and 10% levels.

4.2. Baseline full sample result

The GLM regression estimation results are reported in table 3. The CAR variable is negatively significant, indicating that higher bank regulatory capital ratio leads to a significant decrease in bank loan loss provisions. This implies that banks with higher regulatory capital ratios will keep fewer loan loss provisions. This result is consistent with the findings of Luu et al (2023) who also find a negative relationship between regulatory capital ratio and bank loan loss provisions. The NII variable is insignificant, indicating that bank non-interest income does not have a significant effect on banking sector loan loss provision. The NPL variable is also insignificant, indicating that bank nonperforming loans do not have a significant effect on banking sector loan loss provision. This result is inconsistent with the findings of Degryse and Huylebroek (2023) and Ozili and Arun (2023) who find a positive effect of NPL on LLP. The COST variable is also insignificant, indicating that the cost overhead of banks do not have a significant effect on banking sector loan loss provision. The GDPR variable is negative and significant, indicating that bank loan loss provisions are significantly higher during times of economic recession. This is due to procyclical provisioning which occurs when banks keep fewer provisions in good economic times and keep higher provisions in bad economic times. This result is consistent with Ozili and Arun (2023) who find a negative relationship between economic growth and bank loan loss provisions. The ISI variable is negative and significant, indicating that high institutional quality leads to a significant decrease in loan loss provisions. This implies that the presence of strong institutions in a country is beneficial for banks because it helps in decreasing the size of loan loss provisions in the banking sector.

4.3. LLP determinants in African countries

The GLM regression estimation results are reported in table 3. The AFR*CAR variable is insignificant, indicating that bank regulatory capital ratio does not have a significant effect on banking sector loan loss provision in African countries. The AFR*NII variable is also insignificant, indicating that bank non-interest income does not have a significant effect on banking sector loan loss provision in African countries. The AFR*NPL variable is positive and significant, indicating that higher nonperforming loans leads to a significant increase in bank loan loss provisions in African countries. This result is consistent with Ozili and Arun (2023) who find a significant positive relationship between nonperforming loans and bank loan loss provisions in African countries. The AFR*GDPR variable is also positive and significant,

indicating that bank loan loss provisions are significantly higher during times of economic prosperity in African countries. This might be due to counter-cyclical provisioning which require African banks to keep higher loan loss provisions in good economic times, so that the high provisions that was set aside during the good economic times could be used as a safety buffer during times of economic downturns in African countries. Notwithstanding, this result is inconsistent with Ozili and Arun (2023) who find a negative relationship between economic growth and bank loan loss provisions. The AFR*ISI variable is insignificant, indicating that institutional quality does not have a significant effect on banking sector loan loss provision in African countries. The AFR*COST variable is also insignificant, indicating that the cost overhead of banks do not have a significant effect on banking sector loan loss provision in African countries.

4.4. LLP determinants in European countries

The EUR*CAR variable is insignificant, indicating that bank regulatory capital ratio does not have a significant effect on banking sector loan loss provision in European countries. The EUR*NII variable is also insignificant, indicating that bank non-interest income does not have a significant effect on banking sector loan loss provision in European countries. The EUR*NPL variable is also insignificant, indicating that bank nonperforming loans does not have a significant effect on banking sector loan loss provision in European countries. The EUR*GDPR variable is also insignificant, indicating that the state of the economy does not have a significant effect on banking sector loan loss provision in European countries. The EUR*ISI variable is also insignificant, indicating that institutional quality does not have a significant effect on banking sector loan loss provision in European countries. The EUR*COST variable is also insignificant, indicating that the cost overhead of banks do not have a significant effect on banking sector loan loss provision in European countries.

4.5. LLP determinants in Asian countries

The ASN*CAR variable is insignificant, indicating that bank regulatory capital ratio does not have a significant effect on banking sector loan loss provision in Asian countries. The AFR*NII variable is also insignificant, indicating that bank non-interest income does not have a significant effect on banking sector loan loss provision in Asian countries. The ASN*NPL variable is negative and significant, indicating that higher nonperforming loans leads to a

significant decrease in bank loan loss provisions in Asian countries. This result is surprising and is inconsistent with Degryse and Huylebroek (2023) and Ozili and Arun (2023) who find a significant positive relationship between nonperforming loans and bank loan loss provisions. The ASN*GDPR variable is positive and significant, indicating that bank loan loss provisions are significantly higher during times of economic prosperity in Asian countries. This might be due to counter-cyclical provisioning which require Asian banks to keep higher loan loss provisions in good economic times, so that the high provisions that was set aside during good economic times could be used as a safety buffer during times of economic downturns in Asian countries. Notwithstanding, this result is inconsistent with Ozili and Arun (2023) who find a negative relationship between economic growth and bank loan loss provisions. The AFR*ISI variable is insignificant, indicating that institutional quality does not have a significant effect on banking sector loan loss provision in Asian countries. The ASN*COST variable is negative and significant, indicating that high overhead cost of banks leads to a significant decrease in bank loan loss provisions in Asian countries. This result is expected because Asian banks that have high costs will seek to decrease their loan loss provisions to preserve or increase their earnings.

Tabel 3. Bank loan loss provisions determinants: Generalized Linear Model (GLM) regression estimation

	(1)	(2)	(3)	(4)
Variables	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)
C	134.676*** (0.00)	162.82*** (0.00)	128.114** (0.00)	162.405*** (0.00)
CAR	-3.182*** (0.00)	-3.640*** (0.00)	-3.922*** (0.00)	-3.207** (0.04)
NII	0.250 (0.49)	0.332 (0.38)	0.676* (0.10)	0.351 (0.44)
NPL	-0.308 (0.73)	-4.085*** (0.00)	-0.806 (0.40)	-1.400 (0.17)
GDPR	-2.816* (0.05)	-5.344*** (0.00)	-2.839* (0.06)	-2.822* (0.08)
ISI	-20.063*** (0.00)	-41.769*** (0.00)	-19.187** (0.02)	-13.709* (0.08)
COST	0.423 (0.81)	-0.107 (0.95)	3.520 (0.14)	-2.116 (0.26)
AFR		-43.838 (0.65)		
AFR*CAR		-1.049 (0.72)		
AFR*NII		-0.604 (0.65)		
AFR*NPL		7.984*** (0.00)		
AFR*GDPR		7.347* (0.05)		
AFR*ISI		34.689 (0.28)		
AFR*COST		-6.639 (0.27)		
EUR			-70.704 (0.69)	
EUR*CAR			3.489 (0.68)	
EUR*NII			-0.817 (0.61)	
EUR*NPL			4.054 (0.75)	
EUR*GDPR			3.886 (0.68)	
EUR*ISI			13.973	

			(0.78)	
EUR*COST			-2.536	
			(0.76)	
ASN				-39.061
				(0.44)
ASN*CAR				0.044
				(0.98)
ASN*NII				-0.955
				(0.18)
ASN*NPL				-5.390*
				(0.07)
ASN*GDPR				11.851***
				(0.00)
ASN*ISI				14.516
				(0.37)
ASN*COST				-13.317*
				(0.05)
LR statistic	31.76	59.53	122.66	101.51
Prob(LR statistic)	0.000	0.000	45.16	0.000
***, **, * represent statistical significance at the 1%, 5% and 10% levels.				

4.6. Robustness test: Quantile regression estimation

This section re-estimate the models using the quantile regression method and examines whether the quantile regression results are robust or consistent with the GLM regression results.

In the baseline results, only the ISI variable is statistically significant both in the GLM and the quantile regression estimation results in column 1 of tables 3 and 4. The ISI variable is significant and negative, which confirms that the presence of strong institutions in a country is beneficial for banks because it helps in decreasing the size of loan loss provisions in the banking sector. Meanwhile, the CAR, NII, NPL, GDPR and COST variables are not robust because they do not report the same sign and significance both in the GLM and the quantile regression estimations. In the African countries interaction analysis, only the AFR*GDPR variable is statistically significant both in the GLM and the quantile regression estimation results in column 2 of tables 3 and 4. The AFR*GDPR variable is significant and positive, which confirms that bank loan loss provisions are significantly higher during times of economic prosperity in African countries. This might be due to counter-cyclical provisioning which

require African banks to keep higher loan loss provisions in good economic times, so that the high provisions that was set aside in good times could be used as a safety buffer during times of economic downturns in African countries. Meanwhile, AFR*CAR, AFR*NII, AFR*NPL, AFR*ISI and AFR*COST variables are not robust because they do not report the same sign and significance both in the GLM and the quantile regression estimations. In the European countries interaction analysis, none of the variables are significant in column 3 of tables 3 and 4. This indicates that the EUR*CAR, EUR*NII, EUR*NPL, EUR*ISI, EUR*GDPR and EUR*COST variables are insignificant, indicating that all the variables have no impact on bank loan loss provisions in European countries. In the Asian countries interaction analysis, the ASN*GDPR and ASN*COST variables are statistically significant both in the GLM and the quantile regression estimation results in column 4 of tables 3 and 4. The ASN*GDPR variable is significant and positive, which confirms that bank loan loss provisions are significantly higher during times of economic prosperity in Asian countries. This might be due to counter-cyclical provisioning which requires Asian banks to keep higher loan loss provisions in good economic times, so that the high provisions that was set aside during good times could be used as a safety buffer during times of economic downturns in Asian countries. Meanwhile, ASN*CAR, ASN*NII, ASN*NPL and ASN*ISI variables are not robust because they do not report the same sign and significance both in the GLM and quantile regression estimations.

Table 4. Bank loan loss provisions determinants: Quantile regression estimation

	(1)	(2)	(3)	(4)
Variables	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)
C	69.395*** (0.00)	65.531** (0.01)	69.312** (0.02)	146.348*** (0.00)
CAR	-0.389 (0.52)	-0.313 (0.63)	-0.832 (0.27)	-1.976 (0.13)
NII	0.073 (0.79)	0.095 (0.84)	0.425 (0.31)	0.134 (0.79)
NPL	3.098*** (0.00)	1.470 (0.20)	1.323 (0.20)	-0.996 (0.77)
GDPR	-3.303 (0.18)	-5.392** (0.02)	-5.552** (0.04)	-6.501*** (0.00)
ISI	-11.967** (0.02)	-15.910*** (0.00)	-21.490** (0.01)	-28.793* (0.10)

COST	0.220	7.180*	5.003	-1.708
	(0.85)	(0.07)	(0.13)	(0.45)
AFR		69.933		
		(0.17)		
AFR*CAR		-1.664		
		(0.24)		
AFR*NII		0.116		
		(0.86)		
AFR*NPL		1.395		
		(0.39)		
AFR*GDPR		5.287*		
		(0.08)		
AFR*ISI		24.807		
		(0.21)		
AFR*COST		-15.638***		
		(0.00)		
EUR			-11.954	
			(0.86)	
EUR*CAR			0.318	
			(0.92)	
EUR*NII			-0.566	
			(0.40)	
EUR*NPL			2.253	
			(0.61)	
EUR*GDPR			5.966	
			(0.14)	
EUR*ISI			20.006	
			(0.29)	
EUR*COST			-3.783	
			(0.37)	
ASN				-90.952**
				(0.02)
ASN*CAR				1.006
				(0.51)
ASN*NII				-0.50
				(0.67)
ASN*NPL				1.558
				(0.67)
ASN*GDPR				6.142**
				(0.02)
ASN*ISI				18.903
				(0.31)
ASN*COST				8.896**
				(0.04)

Adjusted R2	17.65	21.47	20.81	23.68
Quasi LR statistic	93.11	157.38	122.66	155.44
***, **, * represent statistical significance at the 1%, 5% and 10% levels				

5. Conclusion

This study examined the determinants of bank loan loss determinants in non-crisis years in African countries, European countries, and Asian countries over an 8-year period. The study used a sample period which covers the years where there was no global crisis from 2011 to 2018. The GLM estimation method and the quantile regression method were used in the empirical analysis.

It was found that institutional quality is a significant determinant of bank loan loss provisions. In the regional analyses, it was found that economic growth is a significant determinant of bank loan loss provisions in African and Asian countries, while bank overhead cost is a significant determinant of bank loan loss provisions in Asian countries.

The implication of the findings is that internal and external factors can affect bank loan loss provisions. Secondly, policymakers need to pay close attention to how institutional quality, the state of the economy and bank overhead cost affect the size of reported loan loss provisions. Ignoring these factors could lead to abnormal jumps or decline in the size of bank loan loss provisions.

The study has several policy recommendations. One, it is recommended that bank managers should strive to lower their overhead cost in order to reduce the size of reported loan loss provisions. Two, it is recommended that bank managers should consider undertaking countercyclical provisioning so that they can have sufficient loan loss reserves that could serve as a buffer to absorb unexpected and expected loan losses during bad economic times. Three, it is recommended that economic policymakers should ensure that there is positive economic growth while bank supervisors should assist the banking sector in lowering their overhead costs since it has been established in this study that there is a passthrough from bank overhead cost to loan loss provisions. A good place to start in assisting banks to lower their overhead cost is for the regulators to reduce the huge cost of regulatory compliance.

Four, it is recommended that accounting setters should consider the role of the state of the economy and bank overhead costs in influencing bank accruals which are subject to manipulation by bank managers.

The limitation of the study is that the determinants of bank loan loss provision were not examined at the level of individual banks. Rather, it was examined at the country-level. Examining the determinants of bank loan loss provisions at the level of individual banks may offer additional insights which are not captured in this study. Another limitation of the study is the short sample period from 2011 to 2018. The narrow period was intended to capture the non-crisis years and avoid the crisis years which were the pre-2010 years and the post 2019 years.

Future research can extend this study by investigating the determinants of bank loan loss provisions using bank-level data. Future research can also re-examine this topic by using a longer sample period. Future research can also extend this study by examining other non-traditional determinants of loan loss provisions that may offer new insights. Finally, future research can extend this study by investigating the determinants of bank loan loss provisions in other regions that were not examined in this study.

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