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Does lower financial stability influence the banks' earnings management? The role of enforcement

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ABSTRACT

We investigate the relationship between financial stability and bank earnings management (EM), moderated by enforcement quality. We use a sample of 828 listed commercial banks across 72 countries from 2000 to 2023 and employ linear regression with a high-dimensional fixed-effects estimator in our analysis. We find a positive and economically relevant effect of lower financial stability on the increase in bank engagement in EM through discretionary loan loss provisions. Furthermore, we find that banks operating in higher enforcement-quality environments are less likely to engage in discretionary loan-loss provision practices, suggesting that incentives to manage earnings decrease due to the likelihood of sanctions for poor financial reporting quality. Our results also demonstrate that enforcement quality negatively moderates the relationship between lower financial stability and EM. Our findings extend previous studies that treated financial stability or enforcement quality as isolated factors and provide new evidence for a worldwide sample, whereas many prior studies have focused on specific regions. Our findings suggest that regulators and policymakers seeking to enhance earnings quality in the banking industry should consider that enforcement quality can help mitigate opportunistic EM, particularly in financially unstable banks. Furthermore, our results highlight the relevance of considering institutional differences in enforcement quality when formulating worldwide banking regulations. In addition, our results could be useful to investors analyzing bank financial statements, particularly for commercial banks with lower financial stability operating in countries with weak enforcement environments.

Keywords: financial stability, earnings management, enforcement.

1. INTRODUCTION

The global financial crisis of 2007-2009 has largely been attributed to banks' excessive risk-taking, which resulted in substantial losses and systemic instability (Biswas et al., 2024; Dal Maso et al., 2018; Proença et al., 2025; Rosa & Gartner, 2017; Shehzad & De Haan, 2015). In this context, the quality of financial reporting in banking institutions is crucial for preserving the stability of the global financial system. This is because the use of accounting information in banks' contracts and regulations enables the monitoring of debt accumulation and the risk exposures these institutions assume (Acharya & Ryan, 2016; Araujo & Dantas, 2022).

A key accounting measure of a bank's quality of financial reporting is the loan loss provision (LLP), which is one of the most significant accruals for financial institutions and is measured primarily through the discretionary judgment of these entities (Mnif & Slimi, 2023). This issue has gained relevance following the adoption of International Financial Reporting Standards (IFRS) 9 – Financial Instruments, supported by the Basel III agreement, which shifted the provisioning approach from the incurred-loss model to the expected-loss model. This transition emphasized institutions' provision matrices, which are now based on historical data and internal estimates (Basel Committee on Banking Supervision, 2011; International Accounting Standards Board [IASB], 2014).

Under these circumstances, where managerial discretion influences financial reporting outcomes, executives may exploit this flexibility to distort the organization's true performance (Vo et al., 2022). This practice, known as earnings management (EM), involves using permitted accounting judgments to achieve desired financial results (Biswas et al., 2024; Proença et al., 2025). In the banking industry, prior studies indicate

that it is particularly susceptible to EM (Biswas et al., 2024), primarily through LLP (Bouvatier et al., 2014; Kanagaretnam et al., 2014; Vo et al., 2022).

Considering the observed advancements in EM research within the banking industry, the literature identifies several explanatory factors for EM, including corporate governance (Shira, 2025), the level of competition (Shira, 2025), board political connections (Proença et al., 2025), deregulation (Mi et al., 2025), audit quality and auditor attributes (Donalby & Massoudi, 2025; Mnif & Slimi, 2024), periods of financial crisis (Allini, Prisco, Ziebart, & Macchioni, 2025), liquidity risk (Allini, Casciello, Maffei, & Ziebart, 2025), ownership structure characteristics (Bouvatier et al., 2014; Pan et al., 2024), dividend policy (Haq et al., 2024), institutional quality (Dal Maso et al., 2018; Di Fabio et al., 2021), and financial stability (Ben Rejeb et al., 2025).

Concerning the influence of financial stability on EM, the findings in the present literature remain limited (Vo et al., 2022). Ben Rejeb et al. (2025) argue that EM through LLPs is more pronounced in banks not experiencing financial distress. However, their sample was limited to the Middle East and North Africa. In contrast, some scholars suggest that banks facing financial instability are more likely to engage in EM. This argument is underpinned by several factors: (a) during a financial crisis, banks may increase LLPs to appear more conservative; (b) heightened regulatory pressure and supervision; and (c) reduced stakeholder expectations, which could facilitate future earnings adjustments during recovery periods.

We use resource dependence theory (RDT) as a theoretical framework to understand the effects of financial instability on EM in financial institutions; this approach offers insights into organizational behavior. According to RDT, organizations depend on external resources, and their actions are influenced by expectations, pressures, and resource-acquisition needs that shape internal decision-making processes (Pfeffer & Salancik, 1978). Banks rely on regulatory approval, liquidity support, reputation, and market legitimacy. All these resources are influenced or granted by banking regulators and supervisors, who continuously monitor and enforce compliance with laws and regulations (Ghosh et al., 2025). Accordingly, from the perspective of RDT, regulators and supervisory authorities, as well as other external agents, act as holders of critical resources for banking institutions, possessing the capacity to either constrain or facilitate organizational behavior (Hillman et al., 2009). In this context, the intensity of supervision and regulatory oversight constitutes a central mechanism through which external dependencies, particularly those associated with resources provided by regulatory agencies, influence banks' financial reporting practices. Therefore, understanding the issue presented in this article through the theoretical lens of RDT is relevant in the banking context, as banking institutions rely heavily on external, multidimensional resources beyond their organizations (Pasiouras & Samet, 2022).

Furthermore, the quality of institutional environments across economies varies widely and can affect different financial outcomes in the banking industry (Boulanouar et al., 2021; Dal Maso et al., 2018; Ewert & Wagenhofer, 2019; Preiato et al., 2015). Since high enforcement quality can constrain managerial discretion, it can promote the quality of financial reporting (Brown et al., 2014; Ewert & Wagenhofer, 2019; Silva et al., 2021). Thus, in environments characterized by low institutional quality, the likelihood of EM increases (Biswas et al., 2024; Dal Maso et al., 2018; Di Fabio et al., 2021). Consequently, we expect that the enforcement quality moderate the relationship between financial stability and EM. In this context, we aim to investigate the relationship between financial stability and bank EM, moderated by enforcement quality.

We test our hypotheses using a worldwide sample of commercial banks from the Refinitiv Workspace (now London Stock Exchange Group [LSEG] Workspace) database,

representing 72 countries from 2000 to 2023. Our results show that lower financial stability increases bank engagement in EM through discretionary LLPs. We also find that banks operating in higher enforcement quality environments have less propensity to engage in discretionary LLP practices. Finally, our results demonstrate that enforcement quality negatively moderates the relationship between lower financial stability and EM.

We find results that contribute to banking regulatory authorities by emphasizing that institutions facing periods of financial instability should be subject to closer oversight, as they may be more prone to engaging in EM. Moreover, the findings suggest that global regulators should consider local institutional heterogeneity when designing regulations, since, as shown, stronger enforcement quality tends to mitigate EM. Therefore, the contributions highlighted in this study contribute to strengthening the stability of the financial system at multiple levels, as limiting EM enhances transparency and predictability in the banking sector.

Our results also contribute to investors and market participants by demonstrating that banking institutions facing financial instability should be analyzed with greater caution, as they may present a higher risk of financial statement distortions. In line with this point, banks in countries with low enforcement quality are more likely to produce lower-quality financial results, which affects the predictability of cash flows, solvency, and risk assessments.

From a theoretical perspective, this study advances the literature by applying RDT to explain findings that lower financial stability increases banks' EM and that this relationship is mitigated by enforcement quality. RDT supports the understanding that, in environments with higher enforcement quality, the power and influence of regulators constrain managerial autonomy, thereby reducing incentives for earnings manipulation. The use of RDT is innovative in this context, as it extends its application to banking accounting, allowing EM to be understood not merely as an opportunistic accounting decision but as a strategic response to environmental dependence relationships.

The remainder of the paper is organized as follows: Section 2 reviews the literature and develops the research hypotheses. Section 3 describes the data selection and methodology. Section 4 reports the research results, robustness checks, and discussion. Finally, Section 5 concludes the paper.

2. PRIOR RESEARCH AND HYPOTHESES DEVELOPMENT

2.1. Relationship between Bank EM and Financial Stability

EM by organizations encompasses various dimensions. One of them is the considerable discretionary power managers have over the accruals process. This discretionary power, in turn, can be used to obscure the organization's fundamental performance (Dechow et al., 2010). In the financial sector, in particular, one key item that can be a source of EM through accruals discretion is LLPs (Bouvatier et al., 2014; Kanagaretnam et al., 2014; Vo et al., 2022; Zhang & McIntyre, 2020).

LLPs are the amounts that banking institutions recognize in their accounting records to cover potential loan defaults. According to IFRS 9 – Financial Instruments, the definition of default used to estimate the risk of its occurrence, as well as the historical risk matrix used in measurement, must be consistent with those adopted by the entity in its internal credit risk management (IASB, 2014), which creates room for discretion (Kanagaretnam et al., 2014; Proença et al., 2025).

Previous literature documents two main variables related to EM by financial institutions: financial performance and banking stability (Biswas et al., 2024). Regarding

financial performance, Mangala and Singla (2022) identified that EM negatively impacts the return on equity and return on assets of commercial banks. Similarly, Zhang and McIntyre (2020) argue that EM, through discretionary LLPs, reduces earnings quality, thereby negatively affecting the liquidity of bank stock trading.

Regarding banking stability, Vo et al. (2022) found a positive and significant relationship between EM through discretionary LLPs and banks' financial stability. However, the sample in this study was limited to Asia-Pacific countries. On the other hand, Sadaa et al. (2023), in a sample restricted to Iraqi banks, found no significant relationship between EM and banking stability, based on the continuity dimension.

Considering banking stability as an explanatory factor in EM, Ben Rejeb et al. (2025) indicate that EM strategies based on LLPs are more commonly implemented in healthy banks. These behaviors persist in banks operating under different monitoring systems and institutional settings. However, this study used a restricted sample, including only banks operating in the Middle East and North Africa region, thereby limiting variability in institutional conditions.

Given that financial stability presents contradictory findings regarding its relationship with EM, this study aims to test this relationship while overcoming the limitations previously observed in the literature, particularly regarding sample constraints. Additionally, RDT provides the necessary foundation for understanding this relationship, as resources significantly influence internal decision-making within financial institutions (Boyd & Runkle, 1993; Hillman et al., 2009; Pasiouras & Samet, 2022; Pfeffer & Salancik, 1978). In this context, we propose the following research hypothesis:

H₁: lower financial stability is positively associated with the bank's EM.

2.2. The Moderating Effect of Enforcement Quality

The quality of institutional factors across economies varies widely and can affect financial outcomes in the banking industry, such as stability, growth, and earnings quality (Boulanouar et al., 2021; Dal Maso et al., 2018; Ewert & Wagenhofer, 2019; Preiato et al., 2015). Essential to institutional quality, enforcement is a multifaceted concept that reflects different features (Brown et al., 2014) associated with both regulatory quality and mechanisms that ensure their implementation (Preato et al., 2015). It is viewed as a key element in promoting the quality of financial reporting (Barth, 2015; Silva et al., 2021).

Enforcement quality improves financial reporting quality because strong enforcement can constrain managerial discretion by limiting opportunistic use of accounting choices in EM and promoting greater transparency and accountability (Brown et al., 2014; Ewert & Wagenhofer, 2019).

Regarding the effect of enforcement quality on EM practices, previous literature suggests a significant impact of enforcement quality on mitigating EM in general (Leuz et al., 2003), as well as in the banking industry (Dal Maso et al., 2018; Di Fabio et al., 2021; Haq et al., 2024; Kanagaretnam et al., 2010; Mnif & Slimi, 2024). These studies have demonstrated that an increase in enforcement quality decreases the level of abnormal components of LLPs (Dal Maso et al., 2018; Di Fabio et al., 2021; Mnif & Slimi, 2024), which is in line with the idea that incentives to manage earnings are reduced due to the likelihood of suffering sanctions for misreporting (Di Fabio et al., 2021).

Ben Rejeb et al. (2025) underscore that financial instability is a significant incentive for EM within the banking industry. Managers may manipulate earnings to meet regulatory requirements and signal the market about financial performance (Ben Rejeb et

al., 2025) as a response to external pressures and resource constraints (Pfeffer & Salancik, 1978). Since government regulations and enforcement quality can enforce stricter standards on banks, encouraging them to engage in conservative practices (Haq et al., 2024) and mitigate the incentives for EM (Dal Maso et al., 2018; Di Fabio et al., 2021; Ewert & Wagenhofer, 2019), we expect that enforcement quality influences the relationship between financial stability and EM.

From the RDT perspective, regulation and enforcement mechanisms are not merely institutional constraints, but rather key components of the external environment that control access to essential resources. Regulatory agents can influence banks' behavior by altering the cost or availability of these resources, for example, through capital adequacy requirements, provisioning rules, or sanctions that affect reputation and investor confidence (Hillman et al., 2009; Pasiouras & Samet, 2022). Organizations' responses to institutional pressures vary from passive conformity to active manipulation, depending on the degree of dependence on external actors and the strength of coercive mechanisms (Oliver, 1991). In the banking context, enforcement can be interpreted as a coercive institutional process to which banks respond strategically to maintain legitimacy and access to resources controlled by regulatory agents. When enforcement quality is high, regulatory coercion limits managerial discretion and reinforces conformity. When enforcement is weak, banks may adopt adaptive or even manipulative strategies, such as EM, to manage their external resource dependence. Hence, we propose the following hypothesis:

H₂: the relationship between financial stability and EM is moderated by the enforcement quality.

3. DATA AND METHODOLOGY

3.1. Sample and Data Collection

Using unbalanced panel data from 828 listed commercial banks, we analyzed a worldwide sample of 7,208 bank-year observations located in 72 countries, spanning 24 years from 2000 to 2023. Following the prior studies (Vo et al., 2022; Zainuldin & Lui, 2020) and aiming to improve the homogeneity of our findings, we only included commercial banks whose North American Industry Classification System classification corresponds to commercial banks in this study. The year 2000 was chosen as the starting point because it is the first year with data availability for our enforcement proxies. The financial data for the banks are obtained from the LSEG Workspace database, and macroeconomic control variables are collected from the World Bank's World Development Indicators (WDI) database. We exclude banks with negative equity and those with missing data for interest and control variables. Finally, we require each firm to have at least five firm-year observations available for the analysis.

3.2. Variable Measurements

3.2.1 Measure of bank EM

Previous studies have used different proxies to measure bank engagement in EM since it is not a directly observable construct (Allini et al., 2025; Bounbou et al., 2024; Elnahass et al., 2022; Haq et al., 2024; Kanagaretnam et al., 2010; Miller et al., 2021; Mnif & Slimi, 2024; Proença et al., 2025; Quttainah et al., 2013; Zainuldin & Lui, 2020).

According to previous literature (Vo et al., 2022), LLPs are the most important accruals for banks and the primary tool they use for EM. Following prior research, we used a two-step approach to measure our dependent variable. We first estimate the non-discretionary LLP using the models by Kanagaretnam et al. (2014) and Proença et al. (2025). The residuals (ϵ) from Eqs. 1 and 2 are the discretionary component of LLP proxies for EM.

$$LLP_{it}/TL_{it-1} = \alpha_0 + \alpha_1 NPL_{it}/TL_{it-1} + \alpha_2 \Delta NPL_{it}/TL_{it-1} + \alpha_3 \Delta TL_{it}/TL_{it-1} + \lambda Country-FE + \phi Year-FE + \epsilon_{it} \quad (1)$$

$$LLP_{it}/TA_{it-1} = \gamma_0 + \gamma_1 Beglla/TA_{it-1} + \gamma_2 NLCO/TA_{it-1} + \gamma_3 \Delta TL/TA_{it-1} + \gamma_4 TL/TA_{it-1} + \gamma_5 NPL/TA_{it-1} + \gamma_{6-12} Loan-Categories + \lambda Country-FE + \phi Year-FE + \epsilon_{it} \quad (2)$$

where TL is total loans, NPL is non-performing loans, ΔNPL is change in non-performing loans, ΔTL is change in total loans, TA is total assets, $Beglla$ is beginning loan loss allowance, $NLCO$ is net loan charge-offs, *Loan-Categories* refer to loans to consumer installment, commercial and industrial, foreign, mortgage and real estate, finance lease and hire purchase, broker/financial institutions, and other loans, all scaled by beginning total assets. *Country-FE* and *Year-FE* denote country-year fixed effects.

3.2.2 Measure of bank financial stability

Consistent with prior literature (Desalegn et al., 2023; Elekdag et al., 2025; Galletta & Mazzù, 2023; Köhler, 2015; Kusi et al., 2023; Laeven & Levine, 2009; Uyar et al., 2022; Vo et al., 2022), we employ the natural logarithm of the Z-score (Roy, 1952), multiplied by -1, as the primary proxy for financial stability. The Z-score indicates the number of standard deviations (SDs) a bank's returns would need to decline before it goes bankrupt or becomes insolvent and has been widely applied as a proxy for bank financial stability (Elekdag et al., 2025; Laeven & Levine, 2009; Vo et al., 2022). To facilitate exposition, we multiply the Z-score by -1, ensuring that higher values correspond to lower financial stability and a greater likelihood of insolvency. The Z-score is calculated as follows:

$$Z-score_{it} = (ROA_{it} + CAR_{it})/\sigma(ROA)_{it} \quad (3)$$

where ROA is the return on assets before LLPs and taxes, CAR is the capital asset ratio, and $\sigma(ROA)$ is the SD of ROA using 3-year rolling windows. For robustness checks, we use the volatility of return on assets $\sigma(ROA)$ as an alternative proxy of financial stability (Marcelin et al., 2022; Mourouzidou-Damtsa et al., 2019; Özsoy et al., 2025).

3.2.3 Measure of enforcement quality

In this study, we used enforcement quality across countries as a moderating variable. Following prior literature, we estimate enforcement quality (ENF) by aggregating six governance dimensions: government effectiveness, voice and accountability, rule of law, political stability and absence of violence/terrorism, regulatory quality, and control of corruption (Beuselinck et al., 2017; Gao et al., 2024; Haq et al., 2024). To capture this, we rely on the governance pillar of the environmental, social, and governance (ESG) score developed by LSEG under the Sustainable Sovereign Risk Methodology. This score, which ranges from 0 to 100, assesses national-level governance

quality and is constructed from governance indicators from the World Bank's Worldwide Governance Indicators (WGI) (LSEG, 2024).

3.2.4 Control variables

We control several factors that can affect the bank's engagement in EM, following previous studies (Allini et al., 2025; Bounbou et al., 2024; Elnahass et al., 2022; Haq et al., 2024; Kanagaretnam et al., 2010; Miller et al., 2021; Mnif & Slimi, 2024; Proença et al., 2025; Quttainah et al., 2013; Zainuldin & Lui, 2020). Our control variables at the bank level include bank size (*Size*), asset growth (*Growth_assets*), change in cash flow (ΔCFO), bank capital adequacy (*CAR*), credit risk (*Credit_risk*), bank deposits (*Deposit*), leverage (*Lev*), non-operational efficiency (*Noninterest*), change in non-performing loans (ΔNPL), and risk-weighted assets (*Risk_assets*). We also control for macroeconomic factors, including growth in gross domestic product ($\ln(GDPgrowth)$), the annual percentage change in consumer prices (*Inflation*), and the change in the unemployment rate (*Unemployment*). Table 1 presents the classification of all variables used in this study, their measurement, prior studies that have used them, and their data sources.

Table 1*Variable measurements*

Variables	Measurement	Authors	Data source
Dependent			
EM/TL_{it-1}	Discretionary loan loss provisions obtained by the residual of Eq. 1	Proença et al. (2025).	LSEG Workspace
EM/TA_{it-1}	Discretionary loan loss provisions obtained by the residual of Eq. 2	Kanagaretnam et al. (2014)	LSEG Workspace
Independent			
$FinInstab$	Natural logarithms of the Z-score multiplied by -1	Desalegn et al. (2023), Elekdag et al. (2025), Galletta and Mazzù (2023), Köhler (2015), Kusi et al. (2023), Laeven and Levine (2009), Uyar et al. (2022), Vo et al. (2022)	LSEG Workspace
$ln(\sigma(ROA))$	Natural logarithms of the 3-year standard deviation of ROA		LSEG Workspace
Moderator			
ENF_{jt}	Country enforcement quality score calculated based on governance indicators obtained from the World Bank's WGI	Beuselinck et al. (2017), Callao et al. (2016), Gao et al. (2024)	LSEG Workspace
$High_ENF_{jt}$	A dummy variable of 1 if ENF_{jt} is above the 75th percentile, 0 otherwise	Beuselinck et al. (2017), Callao et al. (2016), Gao et al. (2024)	LSEG Workspace
Controls			
$Size_{it}$	Natural logarithms of total assets	Kanagaretnam et al. (2010), Mnif and Slimi (2024), Proença et al. (2025)	LSEG Workspace
$Growth_assets_{it}$	Percentage change in total assets	Mnif and Slimi (2024)	LSEG Workspace
ΔCFO_{it}	Percentage change in earnings	Kanagaretnam et al. (2010),	LSEG Workspace

	before taxes and loan loss provisions scaled by beginning total assets	Quttainah et al. (2013)	
CAR_{it}	The ratio of annual equity to total assets	Mnif and Slimi (2024), Proença et al. (2025)	LSEG Workspace
$Credit_risk_{it}$	The ratio of loan loss provisions to total loans	Allini et al. (2025)	LSEG Workspace
$Deposit_{it}$	Bank deposits scaled by beginning total assets	Haq et al. (2024)	LSEG Workspace
Lev_{it}	The ratio between total debts and total equity	Elnahass et al. (2022), Proença et al. (2025)	LSEG Workspace
$Noninterest_{it}$	The ratio between non-interest income and total income	Proença et al. (2025)	LSEG Workspace
ΔNPL_{it}	Percentage change in non-performing loans	Mnif and Slimi (2024)	LSEG Workspace
$Risk_assets_{it}$	Total risk-weighted assets scaled by beginning total assets	Zainuldin and Lui (2020)	LSEG Workspace
$\ln(GDPgrowth)_{jt}$	The natural logarithm of gross domestic product, at constant prices, percent change (%)	Boungou et al. (2024), Haq et al. (2024), Miller et al. (2021)	WDI
$Inflation_{jt}$	Annual percentage of average consumer prices (%)	Haq et al. (2024), Miller et al. (2021)	WDI
$Unemployment_{jt}$	The change in the unemployment rate in the country where the bank is headquartered	Boungou et al. (2024)	WDI

Note: $\ln(\sigma(ROA))$ is used as a financial stability proxy in robustness checks analysis.

LSEG = London Stock Exchange Group; WDI = World Bank's World Development Indicators; WGI = World Bank's Worldwide Governance Indicators.

Source: Elaborated by the authors.

3.3. Econometric Approach

Following previous research on the determinants of bank EM (Haq et al., 2024; Zainulidin & Lui, 2020), we formally examine the relationship between bank EM and financial stability, moderated by enforcement quality, using the linear regression model presented in Eq. 4. Hypothesis H₁ is supported if β_1 is positive and statistically significant, while H₂ is confirmed if the coefficient δ_1 is statistically significant. *Country-FE* and *Year-FE* denote country and year fixed effects.

$$EM_{it} = \beta_0 + \beta_1 FinInstab_{it} + \beta_2 ENF_{jt} + \delta_1 (FinInstab_{it} \times ENF_{jt}) + Z_{1-k} Controls + \theta Bank-FE + \lambda Country-FE + \phi Year-FE + \varepsilon_{it} \quad (4)$$

where *i*, *j*, and *t* indicate bank, country, and year, respectively, *EM* indicates bank EM using discretionary LLPs (EM/TL_{it} or EM/TA_{it}), *FinInstab* denotes the bank's financial instability, and *ENF* represents the country's level of enforcement quality. Additionally, we replaced this variable with *High_ENF*, a dummy variable for high enforcement quality. *Controls* is a vector of control variables, *Bank-FE*, *Country-FE*, and *Year-FE* denote bank-country-year fixed effects, and ε_{it} is a random error term.

We winsorized all continuous variables at the 1st and 99th percentiles to mitigate the influence of outliers. Furthermore, we used clustered robust standard errors to address correlated residuals across firms or time, which can bias ordinary least squares standard errors (Petersen, 2009).

4. EMPIRICAL RESULTS

4.1. Descriptive Statistics

Table 2 presents the sample distribution and descriptive statistics for the variables used in this study. Panel A presents the annual distribution of observations from 2000 to 2023, showing a substantial increase in sample size over time. Panel B reports the descriptive statistics for all variables. Our primary measure of EM (EM/TL_{it} and EM/TA_{it}) has mean values close to 0 and relatively low SDs (0.009 and 0.005, respectively), consistent with Kanagaretnam et al. (2014) and Proença et al. (2025). These results suggest that, on average, banks engage in only modest discretionary loan loss provisioning. However, there is variation across banks.

Table 2*Sample distribution and descriptive statistics*

Panel A – Sample distribution												
Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Obs.	27	28	32	54	55	64	73	92	113	127	145	170
Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Obs.	211	348	508	493	497	499	575	661	590	591	626	629
Panel B – Descriptive statistics												
Variable	n	Mean	SD	Min	p25	p50	p75	Max				
<i>EM/TL_{it}</i>	7,208	0.000	0.009	-0.055	-0.003	0.000	0.001	0.108				
<i>EM/TA_{it}</i>	7,182	0.000	0.005	-0.034	-0.002	0.000	0.001	0.047				
<i>FinInstab_{it}</i>	7,208	-3.534	0.969	-5.927	-4.203	-3.571	-2.912	-0.555				
<i>ln(σ(ROA)_{it})</i>	7,208	-5.773	1.042	-8.287	-6.263	-5.505	-4.747	-3.098				
<i>ENF_{jt}</i>	7,208	74.43	15.65	19.29	64.96	81.60	85.93	91.04				
<i>Size_{it}</i>	7,208	23.203	1.899	18.018	21.777	23.009	24.465	27.964				
<i>Growth_assets_{it}</i>	7,208	0.085	0.149	-0.280	0.005	0.060	0.138	0.932				
<i>ΔCFO_{it}</i>	7,208	0.001	0.011	-0.065	-0.002	0.001	0.004	0.072				
<i>CAR_{it}</i>	7,208	0.101	0.040	0.031	0.072	0.097	0.123	0.560				
<i>Credit_risk_{it}</i>	7,208	0.025	0.028	0.001	0.009	0.014	0.032	0.205				
<i>Deposit_{it}</i>	7,208	0.829	0.174	0.172	0.740	0.832	0.917	1.539				
<i>Lev_{it}</i>	7,208	1.211	1.366	0.000	0.332	0.761	1.566	8.091				
<i>Noninterest_{it}</i>	7,208	0.247	0.154	-0.150	0.143	0.233	0.332	0.998				
<i>ΔNPL_{it}</i>	7,208	0.000	0.010	-0.050	-0.002	0.000	0.002	0.057				
<i>Risk_assets_{it}</i>	7,208	0.691	0.229	0.001	0.543	0.710	0.834	1.417				
<i>ln(GDPgrowth)_{jt}</i>	7,208	2.078	2.102	0.164	0.693	0.958	3.006	8.501				
<i>Inflation_{jt}</i>	7,208	3.05	3.20	-1.13	1.23	2.20	4.12	22.56				
<i>Unemployment_{jt}</i>	7,208	-0.18	1.11	-2.71	-0.59	-0.23	0.05	4.39				

Notes: This table includes the number of observations (*n*), the mean, the standard deviation (*SD*), minimum (*Min*), first quartile (*p25*), median (*p50*), third quartile (*p75*), and maximum (*Max*). *EM/TL* and *EM/TA* are measures of earnings management obtained as residuals from Eqs. 1 and

2, respectively. *FinInstab* is a measure of financial instability computed as the natural logarithm of the Z-score multiplied by -1. *ENF* is a country-level measure of enforcement quality based on the World Bank's Worldwide Governance Indicators, and *High_ENF* is an indicator variable equal to 1 if enforcement quality is above the 75th percentile and 0 otherwise. $(\sigma(\text{ROA}))$ is an alternative proxy to financial instability and represents the natural logarithm of the 3-year SD of return on assets and captures earnings volatility. *Size* is the natural logarithm of total assets. *Growth_assets* is the percentage change in total assets. ΔCFO is the change in earnings before taxes and loan loss provisions (LLPs) scaled by beginning total assets. *CAR* is the ratio of equity to total assets. *Credit_risk* is LLPs scaled by total loans. *Deposit* is deposits scaled by total assets. *Lev* is the ratio of total debt to total equity. *Noninterest* is the ratio of non-interest income to total income. ΔNPL is the percentage change in non-performing loans. *Risk_assets* is risk-weighted assets scaled by total assets. $\ln(\text{GDPgrowth})$ is the natural logarithm of real GDP growth. *Inflation* is the annual change in the consumer price index, and *Unemployment* is the annual change in the unemployment rate.

Source: Elaborated by the authors.

Our main proxy of financial stability (*FinInstab*) has a low mean (-3.534) and a high SD (0.969), which is in line with previous studies (Elekdag et al., 2025; Galletta & Mazzù, 2023; Kusi et al., 2023; Laeven & Levine, 2009; Uyar et al., 2022; Vo et al., 2022). Furthermore, it ranges from -5.927 to -0.555, indicating high variability in bank financial stability. Additionally, the ROA volatility ($\ln(\sigma(ROA))$) has a mean of -5.773 and a SD of 1.042, suggesting differences in the stability of banks' profitability over time. The enforcement quality (*ENF*) has a mean of 74.43 and a SD of 15.65, indicating substantial variation across countries. The minimum value is 19.29, while the maximum is 91.04, suggesting that some jurisdictions operate under very low enforcement conditions, whereas others demonstrate higher enforcement quality.

4.2. Main Findings

Table 3 presents the main findings regarding the effect of financial instability on EM and the moderating effect of enforcement quality on this relationship. Columns 1 and 2 report results using the EM proxy based on the model by Proença et al. (2025), while Columns 3 and 4 follow the model by Kanagaretnam et al. (2014). Panel A reports standardized coefficients to facilitate comparisons of the relative impact of variables within the model. Panel B reports estimates based on *ex ante* standardized variables, allowing interpretation in SD terms and, following Feigenberg et al. (2025), controlling for potential confounding macroeconomic factors that may simultaneously affect enforcement quality and the relationship between financial instability and EM. The results indicate that our regression models are globally significant (the F statistics are significant at the 1% level in all specifications) and have an adjusted R^2 of around 50%, suggesting a good fit.

Table 3

Main analyses: EM models

Panel A – Baseline regression results (standardized coefficients)				
Variables	1	2	3	4
	<i>EM/TL_{it}</i>		<i>EM/TA_{it}</i>	
<i>FinInstab_{it}</i>	0.561***	0.259***	0.542***	0.279***
	(0.129)	(0.041)	(0.128)	(0.038)
<i>ENF_{jt}</i>	0.309		0.116	
	(0.209)		(0.168)	
<i>FinInstab_{it} × ENF_{jt}</i>	-0.086***		-0.078***	
	(0.025)		(0.025)	
<i>High_ENF_{jt}</i>		-0.673***		-0.717***
		(0.171)		(0.167)
<i>FinInstab_{it} × High_ENF_{jt}</i>		-0.179***		-0.181***
		(0.044)		(0.044)
<i>Size_{it}</i>	0.205	0.302	0.258*	0.325**
	(0.160)	(0.158)	(0.141)	(0.139)
<i>Growth_assets_{it}</i>	0.039	0.034	0.036	0.033
	(0.045)	(0.045)	(0.041)	(0.041)
<i>ΔCFO_{it}</i>	-0.367***	-0.367***	-0.403***	-0.402***
	(0.024)	(0.025)	(0.024)	(0.024)

CAR_{it}	0.067	0.083	0.063	0.074
	(0.058)	(0.058)	(0.048)	(0.048)
$Credit_risk_{it}$	0.373***	0.371***	0.215***	0.211***
	(0.074)	(0.074)	(0.067)	(0.066)
$Deposit_{it}$	-0.070	-0.077	-0.065	-0.069
	(0.074)	(0.074)	(0.057)	(0.058)
Lev_{it}	0.090*	0.094**	0.109**	0.110**
	(0.046)	(0.046)	(0.045)	(0.045)
$Noninterest_{it}$	0.071*	0.081**	0.052	0.060
	(0.036)	(0.036)	(0.036)	(0.036)
ΔNPL_{it}	-0.062***	-0.063***	0.039*	0.039*
	(0.021)	(0.021)	(0.021)	(0.021)
$Risk_assets_{it}$	-0.012	-0.002	-0.030	-0.024
	(0.034)	(0.033)	(0.036)	(0.036)
$\ln(GDPgrowth)_{jt}$	-0.598	-0.339	-0.541	-0.381
	(0.469)	(0.519)	(0.442)	(0.468)
$Inflation_{jt}$	0.140***	0.132***	0.143***	0.138***
	(0.040)	(0.039)	(0.035)	(0.035)
$Unemployment_{jt}$	0.065***	0.066***	0.089***	0.089***
	(0.015)	(0.015)	(0.015)	(0.015)
<i>Intercept</i>	-0.0295	-0.0261	-0.0140	-0.0141
	(0.019)	(0.018)	(0.009)	(0.009)
Bank fixed effect	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes
Country fixed effect	Yes	Yes	Yes	Yes
Observations	7,208	7,208	7,182	7,182
Adj. R ²	0.469	0.465	0.497	0.497
F-statistic	23.79***	24.91***	29.23***	30.71***

Panel B – Standardized variables and control for variable bias in interacted models by Feigenberg et al. (2025)

	1	2	3	4
	EM/TL_{it}		EM/TA_{it}	
$FinInstab_{it}$	0.1629***	0.2143***	0.1954***	0.2557***
	(0.022)	(0.033)	(0.024)	(0.034)
ENF_{jt}	0.5761***		0.3935**	
	(0.177)		(0.153)	
$FinInstab_{it} \times ENF_{jt}$	-0.0573**		-0.0529*	
	(0.024)		(0.028)	
$High_ENF_{jt}$		-0.0504		-0.0939**
		(0.042)		(0.042)
$FinInstab_{it} \times High_ENF_{jt}$		-0.1137***		-0.1266***
		(0.035)		(0.039)
$\beta_1 FinInstab_{it} + \delta_1 (FinInstab_{it} \times ENF_{jt})$) or $\beta_1 + \delta_1 (FinInstab_{it} \times High_ENF_{jt})$	0.1056***	0.1006***	0.1425***	0.1290***
	(0.024)	(0.021)	(0.030)	(0.026)
Control	Yes	Yes	Yes	Yes
Bank fixed effect	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes

Country fixed effect	Yes	Yes	Yes	Yes
Observations	7,208	7,208	7,182	7,182
Adj. R ²	0.472	0.469	0.503	0.503
F-statistic	23.84***	23.58***	28.43***	27.98***

Notes: This table reports the regression results on the effect of financial stability on earnings management (EM) through loan loss provision (LLP), using linear regression with a high-dimensional fixed-effects estimator. The bold coefficients report the total marginal effect of financial instability on EM in the presence of the moderating term. Specifically, they correspond to the sum of the direct effect of financial instability and the interaction effect with enforcement. EM/TL and EM/TA are measures of earnings management obtained as residuals from Eqs. 1 and 2, respectively. FinInstab is a measure of financial instability computed as the natural logarithm of the Z-score multiplied by -1. ENF is a country-level measure of enforcement quality based on the World Bank's Worldwide Governance Indicators, and High_ENF is an indicator variable equal to 1 if enforcement quality is above the 75th percentile and 0 otherwise. Size is the natural logarithm of total assets. Growth_assets is the percentage change in total assets. Δ CFO is the change in earnings before taxes and LLPs scaled by beginning total assets. CAR is the ratio of equity to total assets. Credit_risk is LLPs scaled by total loans. Deposit is deposits scaled by total assets. Lev is the ratio of total debt to total equity. Noninterest is the ratio of non-interest income to total income. Δ NPL is the percentage change in non-performing loans. Risk_assets is risk-weighted assets scaled by total assets. $\ln(\text{GDPgrowth})$ is the natural logarithm of real GDP growth. Inflation is the annual change in the consumer price index, and Unemployment is the annual change in the unemployment rate. Panel B follows Feigenberg et al. (2025) to mitigate bias in interaction estimates by controlling for potential confounding macroeconomic factors correlated with enforcement quality that may jointly affect the relationship between financial instability and EM. Clustered heteroscedasticity standard errors at the bank level account for serial correlation in parentheses. To mitigate the influence of outliers, we winsorized all continuous variables at the 1st and 99th percentiles.

*, **, and *** indicate 10%, 5%, and 1% significance levels, respectively, for two-tailed t-tests.

Source: Elaborated by the authors.

Focusing on specifications with continuous enforcement quality, the standardized coefficients indicate that the magnitude of the association between financial instability and EM exceeds that of both credit risk and enforcement quality. A one-standard-deviation increase in financial instability is associated with an increase in EM approximately 50% larger than the effect of an equivalent increase in credit risk and about 80% larger than the effect of enforcement, when EM is measured by EM/TL. When EM is measured by EM/TA, the corresponding differences are more pronounced, with the FinInstab effect exceeding the credit-risk effect by more than 150% and the enforcement effect by around 4.7 times.

Panel B reports estimates based on *ex ante* standardized variables, allowing the interpretation of effect magnitudes in SD terms and a proper assessment of interaction effects. For specifications with continuous enforcement quality (Columns 1 and 3), the effect of financial instability on EM varies across enforcement levels. When enforcement quality is one SD below its mean, a one-standard-deviation increase in financial instability is associated with an increase in EM of approximately 0.22 SDs in Column 1 and 0.25 in Column 3. In contrast, when enforcement quality is one SD above its mean, the corresponding effects decline to about 0.11 SDs in Column 1 and 0.14 in Column 3.

This pattern indicates that stronger enforcement attenuates, but does not eliminate, the positive association between financial instability and EM.

These findings suggest that lower financial stability is positively associated with bank engagement in EM, supporting our hypothesis H₁. The effect is not only statistically significant but also economically relevant in Columns 1 and 3. This finding extends prior evidence on the relationship between EM and financial stability in the banking industry (Ben Rejeb et al., 2025; Sadaa et al., 2023; Vo et al., 2022). Furthermore, our results are consistent with RDT (Boyd & Runkle, 1993; Hillman et al., 2009; Pasiouras & Samet, 2022; Pfeffer & Salancik, 1978), suggesting that financially unstable banks may manipulate LLPs to secure critical resources, such as investor confidence through downward market expectation, regulatory requirements adopting a more conservative approach to credit risk assessment, or access to capital. Given their enhanced dependence on external stakeholders, these banks may strategically use EM to signal stability and reduce perceived risk. Our findings are robust across different EM specifications, reinforcing that financial fragility increases banks' engagement in EM.

In our model, *ENF* is a continuous variable that captures variations in enforcement quality across countries and periods. In Columns 1 and 3, the coefficient of *ENF* is positive but not statistically significant, suggesting that enforcement quality alone does not directly affect EM. However, the interaction term ($FinInstab \times ENF$) is negative and statistically significant, indicating that enforcement quality mitigates the positive relationship between financial instability and EM, as reflected in the conditional effect captured by the combined coefficient $\beta_1 FinInstab + \delta_1 (FinInstab \times ENF)$ reported in Panel B. This finding aligns with RDT: financially unstable banks facing enforcement quality issues have fewer opportunities to engage in EM. In other words, while financial instability commonly increases EM, higher enforcement quality acts as a constraint, limiting the extent to which banks can engage in discretionary loan-loss provisioning practices.

Alternatively, as shown in Columns 2 and 4, we employed our enforcement quality proxy as a dummy variable indicating higher enforcement quality. For these specifications, the results are convergent. When enforcement is low ($High_ENF = 0$), a one-standard-deviation increase in financial instability is associated with increases in EM of approximately 0.21 SDs in Column 2 and 0.26 SDs in Column 4. When enforcement is high ($High_ENF = 1$), these effects decrease to about 0.10 and 0.13 SDs, respectively, reinforcing the mitigating role of stronger enforcement regimes. Our results reinforce the mitigating role of enforcement on the relationship between financial instability and EM, in line with previous literature (Dal Maso et al., 2018; Di Fabio et al., 2021; Mnif & Slimi, 2024). This result supports the idea that enforcement quality moderates financially unstable banks' ability to manipulate earnings. Thus, we do not reject hypothesis H₂.

Regarding the bank characteristics control variables, we find that credit risk, leverage, and non-interest are positively and significantly associated with EM. This finding suggests that riskier banks, more leveraged banks, and those relying on non-traditional income sources engage more in discretionary LLPs practices (Allini et al., 2025; Elnahass et al., 2022; Proença et al., 2025). Conversely, changes in non-performing loans and return on assets are both negatively and significantly associated with EM (Kanagaretnam et al., 2010; Quttainah et al., 2013). Finally, regarding macroeconomic controls, inflation and unemployment are positively and significantly associated with EM, suggesting that economic downturns may pressure banks to engage in EM practices (Boungou et al., 2024; Haq et al., 2024; Miller et al., 2021).

4.3. Further Analysis and Robustness Checks

4.3.1 Alternative specification of financial stability

To further support the previous findings, we perform several robustness checks. To test whether our results are robust across different measures of financial stability, following prior studies (Marcelin et al., 2022; Mourouzidou-Damtsa et al., 2019; Özsoy et al., 2025), we use ROA volatility as an alternative measure. The results in Table 4 reinforce our main finding that lower financial stability is positively associated with greater EM. These findings are consistent with the enforcement quality literature, which suggests that enforcement quality moderates the positive relationship between financial instability and EM.

Table 4

Robustness check: alternative specification of financial stability

Variables	1	2	3	4
	<i>EM/TL_{it}</i>		<i>EM/TA_{it}</i>	
$\sigma(ROA)_{it}$	0.483*** (0.129)	0.206*** (0.039)	0.500*** (0.132)	0.222*** (0.037)
ENF_{jt}	0.163 (0.241)		-0.065 (0.205)	
$\sigma(ROA)_{it} \times ENF_{jt}$	-0.077*** (0.025)		-0.077*** (0.026)	
$High_ENF_{jt}$		-0.877*** (0.243)		-0.939*** (0.238)
$\sigma(ROA)_{it} \times High_ENF_{jt}$		-0.149*** (0.041)		-0.153*** (0.041)
Control	Yes	Yes	Yes	Yes
Bank fixed effect	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes
Country fixed effect	Yes	Yes	Yes	Yes
Observations	7,208	7,208	7,182	7,182
Adj. R ²	0.463	0.459	0.490	0.489
F-statistic	22.97***	24.68***	28.62***	30.14***

Notes: This table reports the regression results on the relationship between financial stability and earnings management (EM) through loan loss provision (LLP), using linear regression with a high-dimensional fixed-effects estimator. *EM/TL* and *EM/TA* are measures of EM obtained as residuals from Eqs. 1 and 2, respectively. $\sigma(ROA)$ is an alternative proxy to financial instability and represents the natural logarithm of the 3-year standard deviation of return on assets and captures earnings volatility. *ENF* is a country-level measure of enforcement quality based on the World Bank's Worldwide Governance Indicators, and *High_ENF* is an indicator variable equal to 1 if enforcement quality is above the 75th percentile and 0 otherwise. We reported the coefficient standardized to compare the relative impact of variables within the model. Clustered heteroscedasticity standard errors at the bank level account for serial correlation in parentheses. To mitigate the influence of outliers, we winsorized all continuous variables at the 1st and 99th percentiles.

*, **, and *** indicate 10%, 5%, and 1% significance levels, respectively, for two-tailed t-tests.

Source: Elaborated by the authors.

4.3.2 Endogeneity test

To test the robustness of the main results and reduce the likelihood of endogeneity, we rerun the analyses using dynamic generalized method of moments (system GMM) estimators (Arellano & Bover, 1995; Blundell & Bond, 1998). These findings are reported in Table 5. By implementing this methodology, our findings can be enhanced using internal instruments and lagged values of the regressors as instruments. Given the inherent difficulty in identifying appropriate instruments for bank-specific factors, the most fitting approach for financial variables is to use their own lagged values as instruments (Köhler, 2015). Consistent with the previous analysis, the results from the two-step system GMM estimator are consistent with our hypotheses.

Table 5

Robustness check: system GMM estimator

Variables	1	2	3	4
	<i>EM/TL_{it}</i>		<i>EM/TA_{it}</i>	
<i>EM/TL_{it-1}</i>	0.560*** (0.044)	0.561*** (0.042)		
<i>EM/TA_{it-1}</i>			0.619*** (0.041)	0.605*** (0.041)
<i>FinInstab_{it}</i>	0.454*** (0.157)	0.174*** (0.050)	0.454** (0.193)	0.254*** (0.061)
<i>ENF_{jt}</i>	-0.264* (0.241)		-0.409*** (0.157)	
<i>FinInstab_{it} × ENF_{jt}</i>	-0.005*** (0.002)		-0.005*** (0.002)	
<i>High_ENF_{jt}</i>		-0.737*** (0.285)		-0.899*** (0.339)
<i>FinInstab_{it} × High_ENF_{jt}</i>		-0.189*** (0.054)		-0.229*** (0.067)
Control	Yes	Yes	Yes	Yes
Bank fixed effect	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes
Observations	6,305	6,305	6,927	6,927
N. of groups	824	824	828	828
N. of instruments	174	186	153	135
AR (1): <i>p</i> -value	0.000	0.000	0.000	0.000
AR (2): <i>p</i> -value	0.631	0.586	0.558	0.590
Hansen test: <i>p</i> -value	0.549	0.523	0.506	0.731
Chi ² -statistic	482.72***	498.28***	689.47***	699.67***

Notes: This table reports the regression results on the effect of financial stability on earnings management through loan loss provision, using a two-step generalized method of moments (system GMM), following Arellano and Bover (1995). *EM/TL* and *EM/TA* are measures of earnings management obtained as residuals from Eqs. 1 and 2, respectively. *FinInstab* is a measure of financial instability computed as the natural logarithm of the Z-score multiplied by -1. *ENF* is a country-level measure of enforcement quality based on the World Bank's Worldwide Governance Indicators, and *High_ENF* is an indicator variable equal to 1 if enforcement quality is above the 75th percentile and 0 otherwise.

We reported the coefficient standardized to compare the relative impact of variables within the model. Robust heteroscedasticity standard errors are shown in parentheses. The Hansen test is used to test for overidentifying restrictions in the GMM model. AR (1) and AR (2) refer to the Arellano-Bond test that averages autocovariance in residuals first and second order, respectively (H_0 : no autocorrelation). To mitigate the influence of outliers, we winsorized all continuous variables at the 1st and 99th percentiles.

*, **, and *** indicate 10%, 5%, and 1% significance levels, respectively, for two-tailed t-tests.

Source: Elaborated by the authors.

4.3.3 Additional analysis: governance control

We included governance quality as an additional control variable to account for potential differences in the level of EM across banks with distinct governance structures. Although these effects are already partially captured through bank fixed effects, we added a direct measure of governance quality to control for cross-sectional variation explicitly. Following prior studies (Ananzeh et al., 2022; Hussain et al., 2024), we used the LSEG governance pillar score (ranging from 0 to 100) as a proxy for corporate governance quality (*Gov_Score*). This analysis, reported in Table 6, is presented as an additional robustness check, given the substantial reduction in sample size resulting from the limited availability of governance data, which may introduce sample selection bias. Nevertheless, the estimates remain consistent with the main findings, confirming the robustness of our conclusions.

Table 6

Additional analysis: governance control

Variables	1	2	3	4
	<i>EM/TL_{it}</i>		<i>EM/TA_{it}</i>	
<i>FinInstab_{it}</i>	0.663** (0.266)	0.254*** (0.086)	0.583** (0.257)	0.250*** (0.083)
<i>ENF_{jt}</i>	0.270 (0.338)		0.091 (0.334)	
<i>FinInstab_{it} × ENF_{jt}</i>	-0.079** (0.038)		-0.068* (0.037)	
<i>High_ENF_{jt}</i>		-0.707** (0.333)		-0.766** (0.321)
<i>FinInstab_{it} × High_ENF_{jt}</i>		-0.160* (0.082)		-0.169** (0.082)
<i>Gov_Score_{it}</i>	-0.170 (0.112)	-0.122 (0.109)	-0.145 (0.106)	-0.116 (0.102)
Control	Yes	Yes	Yes	Yes
Bank fixed effect	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes
Country fixed effect	Yes	Yes	Yes	Yes
Observations	2,321	2,321	2,311	2,311
Adj. R ²	0.444	0.439	0.417	0.417
F-statistic	15.81***	15.33***	13.03***	13.73***

Notes: This table reports the regression results on the effect of financial stability on earnings management (EM) through loan loss provision, using linear regression with a

high-dimensional fixed-effects estimator. *EM/TL* and *EM/TA* are measures of EM obtained as residuals from Eqs. 1 and 2, respectively. *FinInstab* is a measure of financial instability computed as the natural logarithm of the Z-score multiplied by -1. *ENF* is a country-level measure of enforcement quality based on the World Bank's Worldwide Governance Indicators, and *High_ENF* is an indicator variable equal to 1 if enforcement quality is above the 75th percentile and 0 otherwise. *Gov_Score* represents corporate governance quality, proxied by the governance pillar score from the London Stock Exchange Group, ranging from 0 to 100. We reported the coefficient standardized to compare the relative impact of variables within the model. Clustered heteroscedasticity standard errors at the bank level account for serial correlation in parentheses. To mitigate the influence of outliers, we winsorized all continuous variables at the 1st and 99th percentiles.

*, **, and *** indicate 10%, 5%, and 1% significance levels, respectively, for two-tailed t-tests.

Source: *Elaborated by the authors.*

5. CONCLUSION

In this study, we investigate the relationship between financial stability and bank EM, moderated by enforcement quality. We employ the Z-score (Roy, 1952), the World Bank's indicators, and discretionary loan-loss provisions to test the effects of financial stability and enforcement quality on EM. We use a worldwide sample of 828 listed commercial banks across 72 countries from 2000 to 2023. In our analysis, we explored the effect of enforcement as both a continuous variable and a dummy variable for high-quality environmental enforcement.

Our main results indicate an economically relevant effect of lower financial stability on increased bank engagement in EM, consistent with hypothesis H₁. Furthermore, we found that banks operating in higher enforcement quality environments are less likely to engage in discretionary LLP practices, corroborating previous studies that suggest that incentives to manage earnings decrease due to the likelihood of sanctions for poor financial reporting quality (Di Fabio et al., 2021). Moreover, our results, which support our hypothesis H₂, demonstrate that enforcement quality negatively moderates the relationship between lower financial stability and EM. Finally, our findings are robust to several sensitivity tests, such as alternative measurements of our key variables and different econometric estimation methods.

Our study contributes to the literature in at least three ways. First, we extend previous studies that treated financial stability or enforcement quality as isolated factors. Second, we provide evidence for a worldwide sample, whereas many prior studies have focused on specific regions. Third, we treat our enforcement proxy as a continuous variable, enabling a more nuanced analysis of its impact.

Our findings provide important policy implications. Regulators and policymakers who want to enhance earnings quality in the banking industry should consider that enforcement quality can help mitigate opportunistic EM, particularly in financially unstable banks. Furthermore, our results highlight the relevance of considering institutional differences in enforcement quality when formulating worldwide banking regulations. In addition, our results could be useful to investors analyzing bank financial statements, particularly for commercial banks with lower financial stability operating in countries with weak enforcement environments.

This study has some limitations. First, although the baseline analyses rely on a broad international panel of listed commercial banks, the inclusion of bank-level

governance information in additional analyses substantially reduces the number of observations due to data availability, as reported in Table 6. This reduction is economically meaningful (approximately 70%), implying that the resulting subsample is unlikely to be random and may be subject to sample selection bias, potentially affecting coefficient magnitudes and limiting generalizability.

Moreover, the panel exhibits a lower concentration of observations in earlier years of the sample. The main results remain qualitatively unchanged when the analyses are restricted to the period with higher data availability (2013-2023). Second, the analysis relies on indirect proxies to capture EM, financial instability, and enforcement quality, which are subject to the usual measurement limitations. Third, consistent with previous studies, the empirical design identifies associations between financial stability, enforcement quality, and EM and does not establish causal relationships.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

DATA AVAILABILITY STATEMENT

The dataset supporting the results of this study is not publicly available.

GENERATIVE AI DISCLOSURE

The authors declare that no generative artificial intelligence was used in any stage of the production of this manuscript (including research, writing, data analysis, formula generation, or the creation of graphic elements).

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