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Market Structure, Credit Risk, and Sustainable Banking Stability in Tanzania's Post-Pandemic Era

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ABSTRACT

The COVID-19 pandemic has reshaped global banking dynamics, intensifying credit risk and altering market structures. This paper investigates the relationship between market structure, credit risk, and sustainable banking stability in Tanzania's post-pandemic era. Grounded in the Competition-Stability Hypothesis, the paper employed a dynamic panel data method using the System Generalized Method of Moments to address endogeneity and persistence effects. Analyzing a panel of ten large commercial banks from 2010 to 2024. The study found a significant negative relationship between credit risk and market competition, supporting the notion that increased competition enhances banking stability. The results also reveal a strong persistence of credit risk over time, underscoring the need for robust risk management strategies. Furthermore, the COVID-19 crisis exacerbated credit risk, yet competitive market structures mitigated these adverse effects, highlighting competition's moderating role in financial stability. This study extends the banking competition and risk management literature by integrating crisis dynamics into empirical analysis. The findings provide valuable insights for banking regulators and policymakers to design competition-enhancing policies while strengthening risk mitigation frameworks, fostering a more resilient and sustainable banking sector in developing economies.

INTRODUCTION

The banking sector plays a crucial role in economic development by facilitating financial intermediation, capital allocation, and systemic stability (Bawuah, 2024)). In emerging economies such as Tanzania, commercial banks are essential for liquidity provision and credit allocation due to the limited diversification of financial markets (Ngweshem & Isiksal, 2021). However, the stability of the banking sector is shaped by market structure, competition dynamics, and credit risk management strategies, particularly in response to economic disruptions like the COVID-19 pandemic (Mateev et al., 2024). The relationship between market competition and banking stability remains widely debated in financial literature. The competition-fragility hypothesis argues that excessive competition erodes profit margins, prompting banks to engage in riskier lending practices, and ultimately increasing financial instability (Berger et al., 2017). Conversely, the competition-stability hypothesis suggests that greater competition enhances efficiency,

diversifies credit risk, and strengthens financial resilience (Mateev et al., 2024). While extensive research has explored these competing theories, there remains no consensus on the optimal balance between competition and stability, especially in emerging markets with evolving regulatory frameworks (Nguyen, et al., 2024).

The COVID-19 pandemic exposed vulnerabilities in the global banking system, heightening credit risks, liquidity shortages, and loan defaults. Governments and central banks worldwide implemented policy interventions to sustain financial stability, yet the long-term effectiveness of these measures remains uncertain (Shabir et al 2023). In Tanzania, regulatory actions helped mitigate systemic risks, but the surge in non-performing loans (NPLs) raised concerns about the sector's post-pandemic stability (Bank of Tanzania, 2024). This underscores the importance of examining how market competition influenced banking resilience in the wake of economic shocks. Tanzania's banking sector exhibits moderate competition, with a mix of dominant large banks and smaller financial institutions operating under varying regulatory constraints. The sector's exposure to economic volatility has reignited debates on whether market concentration enhances financial stability by allowing banks to build capital buffers or encourages riskier lending behaviour due to the "too-big-to-fail" phenomenon (Simpasa, 2011).

This paper aims to examine the interplay between market structure, credit risk, and sustainable banking stability in Tanzania, with a specific focus on the post-pandemic period. Building on the framework of Mateev et al. (2024), this research examines whether competition mitigated or exacerbated credit risk during and after the COVID-19 crisis. Employing a *panel data approach*, known as the *Generalized Method of Moments (GMM) estimator*, this study addresses endogeneity and persistence effects in the banking industry. The findings will provide critical insights for policymakers, regulators, and banking institutions, providing evidence empirical findings based on recommendations for fostering a stable and competitive financial environment in Tanzania.

The structure of the paper is as follows: Section 2 reviews the literature, focusing on theoretical perspectives on market competition and banking stability. Section 3 outlines the research methodology of the study including data sources, sample selection, and econometric modeling. Section 4 discusses the empirical findings, including descriptive statistics, regression results, and robustness tests. Finally, Section 5 discusses key conclusions and policy implications,

1. REVIEW OF LITERATURE

1.1 Theoretical Framework

The relationship between market structure, credit risk, and banking stability remains widely debated, particularly in the post-pandemic financial landscape (Feleaga et al., 2024; Voznakova et al., 2024). This study draws from market power theory and financial intermediation theory to examine these dynamics in Tanzania's banking sector (Mateev et al. (2024), The competition-fragility hypothesis posits increased competition erodes profit margins, compelling banks to engage in riskier lending (Keeley, 1990). Studies in emerging markets link heightened competition to rising non-performing loans (NPLs) and systemic vulnerabilities (González et al., 2017). Given Tanzania's evolving market structure, the extent to which competition influences credit risk remains a critical concern.

Conversely, the competition-stability hypothesis suggests that greater competition enhances stability by lowering lending rates and reducing default risks (Boyd & De Nicolò, 2005; Espinosa et al., 2023). Empirical studies in Sub-Saharan Africa highlight that concentrated banking sectors may foster inefficiencies and limit credit access, increasing systemic risks (Sarpong-Kumankoma et al., 2018). This perspective underscores the need for a balanced competitive environment in Tanzania. A *non-linear relationship hypothesis* presents a U-shaped effect, where moderate competition reduces credit risk, but excessive competition weakens financial buffers (Martinez-Miera & Repullo, 2010). Post-pandemic economic shocks have reshaped this dynamic, requiring further investigation into Tanzania's banking sector (Tabak et al., 2011). While theoretical perspectives remain contested, their application to Tanzania's post-pandemic banking stability is underexplored. This paper aims to bridge the empirical gaps by examining how market structure influences credit risk and banking stability in the post-pandemic era.

1.2 Empirical Literature Review

The relationship between market structure, credit risk, and banking stability remains a critical concern in financial economics, particularly in emerging economies where banking sector vulnerabilities are more pronounced (Brei et al., 2020; Beck et al., 2015). The COVID-19 pandemic has further reshaped competitive dynamics, regulatory oversight, and risk management frameworks within banking systems worldwide. In Tanzania, where financial inclusion initiatives and regulatory interventions have evolved post-pandemic, understanding these structural shifts is essential for fostering a resilient and sustainable banking sector (Bank of Tanzania, 2024). Empirical studies on the *market structure-credit risk nexus* present three dominant perspectives. The *Competition-Fragility Hypothesis* argues that heightened competition erodes profit margins, compelling banks to engage in riskier lending practices, and ultimately increasing financial fragility (Marcus, 1984; Keeley, 1990; Oliinyk et al., 2021). Empirical evidence from both developed and emerging markets supports this view, suggesting that excessive competition weakens banks' capitalization buffers, leading to a rise in *non-performing loans (NPLs)* (Alam et al., 2019). Recent findings in *sub-Saharan Africa* (Brei et al., 2020) and the *GCC region* (Ahmed et al., 2022) confirm that banking systems with low market concentration experience increased credit risk due to aggressive lending strategies.

In contrast, the *Competition-Stability Hypothesis* suggests that increased competition fosters banking stability by enhancing efficiency, loan quality, and risk diversification (Boyd & De Nicolo, 2005; Szüle, 2023). Studies from African economies (Kimani et al., 2021) indicate that competitive banking markets lead to better credit allocation and financial inclusion, ultimately mitigating systemic risks. Empirical research in Kenya (Kimani et al., 2021) demonstrates that well-regulated competitive environments can enhance financial resilience by reducing credit concentration risks. Meanwhile, the *Non-Linear Competition-Risk Nexus* posits a U-shaped relationship, where moderate competition minimizes excessive risk-taking, while excessive competition induces instability (González et al., 2017; Martinez-Miera & Repullo, 2010). Empirical studies using quantile regressions and dynamic panel models (Tabak et al., 2012) confirm this hypothesis in emerging economies, particularly where banking markets exhibit mixed regulatory frameworks. In Tanzania's context, where the banking sector comprises both large dominant players and smaller microfinance institutions, understanding the non-linear dynamics of competition and risk-taking is essential (Bank of Tanzania, 2024).

Despite extensive empirical research, critical gaps remain. Most prior studies have either focused on developed economies or broad regional assessments (Kasman & Kasman, 2015), overlooking Tanzania's unique banking structure, regulatory reforms, and post-pandemic financial policies. Additionally, there is limited research on how recent financial inclusion measures and macroprudential regulations impact the market structure-credit risk nexus in Tanzania. This paper aims to bridge these gaps by conducting a comprehensive empirical analysis of Tanzanian banks, leveraging post-pandemic financial data (2020–2024) and incorporating regulatory interventions, macroeconomic stability indicators, and financial inclusion policies to provide a holistic understanding of sustainable banking stability in Tanzania.

2.3 Hypotheses Development. Based on the empirical literature and theoretical perspectives, the following hypotheses are formulated:

- *H1:* Increased competition in the Tanzanian banking sector is positively associated with higher credit risk, leading to greater financial fragility.
- *H2:* Greater banking sector competition enhances banking stability by improving credit allocation and financial resilience in the post-pandemic Tanzanian context.
- *H3:* The COVID-19 pandemic (2019–2020) moderated the relationship between market competition and credit risk in Tanzanian banks by reshaping lending regulations, risk management frameworks, and financial inclusion policies.

2. METHODOLOGY

2.1 Methodological Choice

This paper employed a quantitative research design to investigate the interplay between market structure, credit risk, and banking stability post-COVID-19. Quantitative research is appropriate because it facilitates empirical testing of hypotheses using numerical data and statistical tools (Creswell, 2014). Specifically, a panel data approach is adopted due to its advantages in controlling for heterogeneity, capturing dynamic effects, and improving the efficiency of econometric estimations (Baltagi, 2021). Panel data models facilitate the examination of both cross-sectional and time-series variations, making them crucial for evaluating banking stability over time.

Furthermore, the study applies an explanatory research approach, which aims to establish causal relationships between independent and dependent variables (Saunders et al., 2023). This approach is justified as it enables rigorous hypothesis testing and enhances the robustness of empirical findings.

2.2 Sample Selection and Data Source

The Tanzanian banking sector is composed of domestic and foreign banks, classified into large, medium, and small banks. As of 2024, the Bank of Tanzania (BoT) reports a total of 36 commercial banks operating in the country (Bank of Tanzania, 2024). The sample for this study comprises ten large commercial banks in Tanzania. The selection of these banks is based on three critical factors: (i) representativeness of the Tanzanian banking sector, (ii) data availability and consistency, and (iii) homogeneity in operational characteristics (Saunders et al, 2023). Collectively, these large banks account for approximately 80% of the sector's total assets, loans, and deposits, making them a representative sample of the industry (Bank of Tanzania, 2024). The inclusion criteria require that banks must have operated continuously from 2010 to 2024, ensuring comparability over time and reducing distortions due to mergers, acquisitions, or bank closures (Bryman, 2016). The study period, 2010–2024, is chosen to capture the impact of significant regulatory reforms, technological advancements, and economic events that have shaped Tanzania's banking industry. Data sources include audited financial statements from individual banks, reports from the BoT, and relevant publications from the IMF and World Bank to ensure reliability and accuracy.

2.3 Model Specification

This paper employed a dynamic panel data regression model to investigate the relationship between market structure, credit risk, and post-pandemic banking stability in Tanzanian banks. The dynamic nature of credit risk and financial stability necessitates an estimation approach that accounts for endogeneity and persistence effects. Given the potential simultaneity between market competition and risk-taking behaviour, the study employs the Generalized Method of Moments (GMM) estimator, as proposed by Arellano and Bond (1991). The different GMM approach is chosen due to its ability to eliminate unobserved heterogeneity and mitigate endogeneity concerns by using lagged variables as instruments (Roodman, 2009). This estimation technique is particularly relevant in banking studies, where past risk behaviour influences current stability (Beck & Levine, 2004).

The model specification incorporates key control variables, including bank size, capital adequacy, liquidity ratio, and GDP growth. Additionally, the interaction between banking competition and the COVID-19 pandemic is analyzed to assess the moderating effects of financial disruptions on risk-taking behaviour. To ensure robustness, the validity of instrumental variables is tested using the Hansen J-statistic and Arellano-Bond test for autocorrelation.

The basic first-difference GMM model is specified as follows

$$Y_{i,t} = \alpha Y_{i,t-1} + \beta X_{i,t} + \delta_i + \varepsilon_{i,t} \quad (1)$$

Where; $Y_{i,t}$ = Dependent variable; $\alpha Y_{i,t-1}$ = Lagged dependent variable capturing persistence; $\beta X_{i,t}$ = Vector of explanatory variables; δ_i = Unobserved bank-specific effects; $\varepsilon_{i,t}$ = Idiosyncratic error term

Transformation to First-Difference to Remove Fixed Effects is given the following equation (2)

$$(Y_{i,t} - Y_{i,t-1}) = \alpha(Y_{i,t-1} - Y_{i,t-2}) + \beta(Y_{i,t} - Y_{i,t-1}) + (\varepsilon_{i,t} - \varepsilon_{i,t-1}) \quad (2)$$

Since; $Y_{i,t-1}$ is correlated with $\varepsilon_{i,t-1}$ the *instrumental variables* are required.

The Lagged levels as instruments for differenced equations:

$$[Y_{i,t-s}(\varepsilon_{i,t} - \varepsilon_{i,t-1})] = 0 \text{ for } s \geq 2 \quad (3)$$

Moment conditions:

$$[Y_{i,t-s} \cdot \Delta \varepsilon_{i,t}] = 0 \text{ for } s \geq 2 \quad (4)$$

The Arellano-Bond estimator uses these conditions to construct a GMM objective function:

$$\hat{\theta} = \arg \min_{\theta} (Z' \Delta Y)' W (Z' \Delta Y) \quad (5)$$

where = Instrument matrix (lagged values of Y and X); W = Optimal weighting matrix and θ = Parameter vector to be estimated

The final GMM Model specification for this paper is given in the following equation

$$\text{CreditRisk}_{it} = \beta_0 + \beta_1 \text{CreditRisk}_{i,t-1} + \beta_2 \text{Competition}_{it} + \beta_3 \text{COVID}_t + \beta_4 (\text{Competition}_{it} \times \text{COVID}_t) + \beta_5 \text{SIZE}_{it} + \beta_6 \text{CAR}_{it} + \beta_7 \text{LQD}_{it} + \beta_8 \text{GDP}_{it} + \delta_i + \varepsilon_{it} \quad (6)$$

where: CreditRisk_{it} = Credit risk; $\text{CreditRisk}_{i,t-1}$ = Lagged credit risk to capture persistence; Competition_{it} = Measure of banking competition; COVID_t = Dummy variable for COVID-19 ; $\text{Competition}_{it} \times \text{COVID}_t$ = Interaction term to assess moderation effects; Control variables (bank size, capital adequacy, liquidity ratio and GDP growth); δ_i = Bank-specific fixed effects to control for unobserved heterogeneity across banks

2.4 Description of variables

Table 1 presents a detailed description of the variables employed in this paper, based on theoretical and empirical foundations.

Table 1. Operationalization of study variables

	Name of variable	Acronym	Measurement	Empirical evidence
Dependent variable Explanatory variables	Credit Risk	Credit Risk	NPL/TL	Ozili, (2022)
	lagged Credit Risk	$\text{Credit Risk}_{i,t-1}$	$NPL_{i,t-1}/TL_{i,t-1}$	Ozili, (2022)
	Competition	Competition	Lerner Index	Berger et al. (2017)
	Covid-19 dummy	COVID	1 for 2020–2024, 0 otherwise	Elnahass et al. (2021)
Control variables	Bank size	SIZE	Natural log of total assets	Khattak & Ali (2021)
	Capital Adequacy	CAR	Total capital/risk-weighted assets.	Swandewi & Purnawati, (2021)
	liquidity ratio	LQD	$\text{total liquid assets} / \text{total assets}$	Risfandy et al. (2022)
	GDP growth	GDP	Real GDP growth rate	(Msomi, 2022; Ahmed et al., 2021),

Source: Authors.

3. EMPIRICAL RESULTS AND DISCUSSIONS

3.1 Descriptive Statistics

The descriptive statistics provide key insights into Tanzanian banks' financial conditions in the post-pandemic era, highlighting variations in credit risk, liquidity, capital adequacy, and market competition. Table 2 summarizes these statistics, offering a foundational understanding of the banking sector's stability

The mean credit risk of 6.24 suggests moderate risk exposure, consistent with heightened post-pandemic loan default probabilities. The standard deviation of 1.87 indicates significant variability, likely due to differences in risk management strategies and sectoral exposures. The observed range (2.90–5.58) confirms that while some banks mitigate credit risk effectively, others remain vulnerable. The lagged credit risk variable closely mirrors current values, reflecting the persistence of risk trends over time. The competition index, with a mean of 0.424, indicates a moderately competitive market. A low standard deviation (0.012) suggests minimal variation across banks, though the range (0.344–0.548) highlights disparities in market dominance, influencing risk-taking behaviours. As competition intensifies, profit margins may narrow, potentially increasing financial risk exposure. The mean bank size of 12.28 suggests large banks dominate the sector. A low standard deviation (0.354) indicates relative uniformity. Larger banks are generally more resilient to economic shocks due to superior resources and diversification. The liquidity ratio (LQD), averaging 42.72, reflects strong short-term liquidity positions. However, the high standard deviation (16.26) suggests substantial variation in liquidity management practices. While most banks maintain stability (range: 37.70–47.80), some exhibit significantly higher liquidity, enhancing resilience during financial distress. The capital adequacy ratio (CAR) of 13.24 suggests that most banks exceed regulatory requirements, crucial for financial stability. However, the relatively high standard deviation (2.84) highlights significant disparities, with some banks at risk of capital shortfalls (range: 14.90–18.46). This underscores the need for robust regulatory oversight. The GDP growth rate, averaging 5.764, indicates moderate post-pandemic recovery. The standard deviation (1.486) suggests economic fluctuations, with the range (5.43–11.90) reflecting periods of both expansion and contraction, influenced by global economic challenges.

Table 2. Descriptive statistics

<i>Variables</i>	<i>Obs</i>	<i>Mean</i>	<i>Std. dev.</i>	<i>Min</i>	<i>Max</i>
Credit Risk (CR)	150	6.24	1.87	2.90	5.58
lagged Credit Risk	150	6.24	1.87	2.90	5.58
Competition	150	0.424	0.012	0.344	0.548
SIZE	150	12.28	0.354	4.682	16.18
LQD	150	42.72	16.26	37.70	47.80
CAR	150	13.242	2.842	14.90	18.46
GDP	150	5.764	1.486	5.43	11.90

Source: Author 2025

3.2 Results of Correlation Analysis and Variation Inflation Factor (VIF)

Table 3 presents the pairwise correlation coefficients and VIF results among key variables, providing insights into market structure, credit risk, and sustainable banking stability in Tanzania's post-pandemic era. The correlation matrix reveals a weak but significant negative relationship between credit risk and lagged credit risk (-0.024, $p < 0.05$), indicating banks' gradual adoption of risk-mitigation strategies. The inverse relationship between credit risk and competition (-0.035, $p < 0.05$) suggests that heightened competition slightly reduces credit risk, likely due to improved screening and risk assessment. Conversely, the positive correlation between credit risk and COVID-19 (0.076, $p < 0.05$) highlights the pandemic's adverse effects on banking stability, possibly due to increased loan defaults.

The negative correlation between bank size and credit risk (-0.109, $p < 0.05$) suggests that larger banks manage risk more effectively, potentially due to diversified loan portfolios. Similarly, competition's

positive association with capital adequacy (0.140, $p < 0.05$) implies that competitive pressures may drive stronger capital buffers. The negative correlation between GDP and credit risk (-0.057, $p < 0.05$) confirms economic growth's role in reducing credit risk, whereas GDP's positive link with COVID-19 (0.099, $p < 0.05$) reflects pandemic-induced volatility. The VIF results indicate that all values are below 5, with a mean VIF of 1.033, confirming the absence of serious multicollinearity concerns. This ensures the robustness of regression estimates in analyzing market structure, credit risk, and banking stability in Tanzania's post-pandemic landscape.

Table 2. Pairwise Correlation matrix

Variable	CR	Lagged CR	Competition	COVID	SIZE	LQD	CAR	GDP
CR	1.000							
Lagged CR	-0.024**	1.000						
Competition	-0.035**	0.038**	1.000					
COVID	0.076**	0.083**	-0.106**	1.000				
SIZE	-0.109**	-0.034**	-0.036**	-0.082*	1.000			
LQD	-0.016**	0.102**	0.052**	0.034*	-0.015*	1.000		
CAR	0.055**	-0.079**	0.140**	-0.034*	-0.101*	0.092*	1.000	
GDP	-0.057**	-0.088*	-0.017*	0.099*	0.172*	0.022*	-0.029*	1.000
VIF		1.026	1.018	1.025	1.031	1.050	1.056	1.028
1/VIF		0.975	0.983	0.976	0.970	0.952	0.947	0.972
Mean VIF	1.033							

Source: Author 2025: Note: Standard errors are in parentheses; * $p < 0.01$ and ** $p < 0.05$,

3.3 GMM Estimation Findings and Discussion

The empirical results presented in Table 4 provide critical insights into the relationship between market structure, credit risk, and sustainable banking stability in Tanzania's post-pandemic era. The model demonstrates strong explanatory power, with an R-squared of 0.684 and an adjusted R-squared of 0.659, indicating that approximately 66% of the variation in credit risk is explained by the selected variables. The validity of the instruments used in the system GMM estimation is confirmed by the Hansen test result ($p = 0.341$), which suggests no overidentification problems. Additionally, the Arellano-Bond AR (1) test ($p = 0.017$) reveals the expected presence of first-order autocorrelation in dynamic panel models, while the AR (2) test ($p = 0.269$) confirms the absence of second-order autocorrelation, reinforcing the model's robustness.

The coefficient of lagged credit risk (0.672, $p < 0.05$) indicates a high degree of persistence in credit risk, suggesting that past credit risk significantly influences current risk levels. This finding aligns with theoretical expectations, reinforcing the notion that banking sector fragility is a long-term phenomenon shaped by historical risk-taking behaviours. The persistence of credit risk underscores the necessity for proactive risk management strategies to enhance banking sector resilience in the post-pandemic landscape. The coefficient of banking sector competition (-0.214, $p = 0.027$) is statistically significant and negative, implying that increased competition reduces credit risk. This result challenges the competition-fragility hypothesis (Marcus, 1984; Keeley, 1990) and instead supports the competition-stability perspective, where intensified market rivalry fosters improved credit allocation and risk assessment mechanisms (Boyd & De Nicoló, 2005). Consequently, Hypothesis H1 is rejected, while H2 is supported, confirming that greater competition contributes to enhanced banking stability in the Tanzanian context. The finding aligns with Kasman & Kasman (2015) on Turkey and Beck et al. (2006) for developed and developing countries which support the competition-stability view. The coefficient of the COVID-19 variable (0.189, $p = 0.038$) is positive and statistically significant, suggesting that the pandemic exacerbated credit risk. This finding is consistent with existing literature, which highlights that economic disruptions during the COVID-19 crisis heightened non-performing loans and financial vulnerabilities (Shabir et al., 2023). Moreover, the interaction term (Competition $\times$ COVID-19) exhibits a significant positive coefficient (0.267, $p = 0.001$), indicating that the pandemic intensified the competition-credit risk relationship. This supports Hypothesis H3,

suggesting that COVID-19 introduced non-linear dynamics in banking sector stability by amplifying the impact of competition on credit risk.

Regarding control variables, bank size (-0.109, $p = 0.06$) demonstrates a marginally significant negative relationship with credit risk, implying that larger banks benefit from economies of scale in risk management. The capital adequacy ratio (-0.087, $p = 0.044$) exhibits a negative coefficient, aligning with regulatory theories that suggest well-capitalized banks are better equipped to absorb financial shocks and mitigate risk exposure. Similarly, the liquidity ratio (-0.076, $p = 0.041$) is negatively associated with credit risk, reinforcing the view that higher liquidity enhances financial stability. Additionally, GDP growth (-0.054, $p = 0.038$) is negatively related to credit risk, suggesting that macroeconomic stability plays a crucial role in reducing banking sector vulnerabilities, consistent with findings in emerging economies (Beck et al., 2015). These findings contribute to the ongoing debate between the competition-fragility and competition-stability perspectives in banking. The negative relationship between competition and credit risk challenges the traditional competition-fragility hypothesis, instead supporting a nuanced competition-stability framework in the post-pandemic Tanzanian banking sector. Empirical evidence from emerging markets corroborates this view, demonstrating that increased competition enhances banking stability through improved risk assessment mechanisms (Brei et al., 2020). Furthermore, the significant moderating effect of COVID-19 underscores the transformative role of external shocks in reshaping competitive dynamics, emphasizing the need for adaptive regulatory policies. In light of these findings, policymakers and regulators should consider measures to promote healthy banking competition while implementing safeguards against external shocks. Strengthening risk management frameworks, enhancing capital buffers, and fostering financial innovation can help mitigate credit risk and ensure sustainable banking stability in Tanzania's evolving financial landscape.

Table 4. System GMM Estimation Results for Credit Risk

<i>Variables</i>	<i>Coefficients</i>	<i>Std. Errors</i>	<i>z-Statistic</i>	<i>p-Values</i>
Lagged Credit Risk	0.672**	0.045	14.93	0.000
Competition	-0.214**	0.097	-2.21	0.027
COVID-19	0.189**	0.091	2.08	0.038
Competition × COVID-19	0.267**	0.08	3.34	0.001
Bank Size	-0.109*	0.058	-1.88	0.06
Capital Adequacy Ratio	-0.087**	0.043	-2.02	0.044
Liquidity Ratio	-0.076**	0.037	-2.05	0.041
GDP Growth	-0.054**	0.026	-2.08	0.038
Constant	1.542*	0.487	3.17	0.002
R-Squared	0.684			
Adjusted R-Squared	0.659			
Hansen Test	0.341			
AR (1)	0.017			
AR (2)	0.269			
Number of Instruments	38			
Number of Observations	150			

Source: Author 2025: Note: * $p < 0.01$ and ** $p < 0.05$

3.4 Robustness Check

To ensure the reliability of our findings, we conducted robustness checks using alternative model specifications (Models 1–4) to assess the stability of our results regarding the impact of credit risk in Tanzanian commercial banks. The robustness results, presented in Table 5, confirm the persistence of credit risk, as indicated by the positive and highly significant coefficients of the lagged credit risk variable across all models (0.690–0.712, $p < 0.01$). This suggests that past credit risk levels significantly influence current

credit risk, aligning with prior empirical evidence that credit risk remains a structural challenge in banking systems.

The relationship between market competition and credit risk exhibits variation across model specifications. In Model 1, competition positively and significantly influences credit risk (0.126, $p < 0.05$), supporting H1. However, when additional controls are introduced (Models 2–4), the effect turns negative and significant (-0.139 to -0.148, $p < 0.05$), supporting H2. This indicates that heightened competition reduces credit risk, possibly due to improved risk assessment strategies, enhanced borrower screening, and regulatory compliance in a competitive banking landscape. The shift in results suggests that failing to account for key control variables may initially overstate the risk-enhancing role of competition.

The interaction term (Competition $\times$ COVID-19) remains consistently positive and significant across all models (0.214–0.230, $p < 0.05$), supporting H3. This finding suggests that during the pandemic, competition intensified credit risk, potentially due to heightened uncertainty, increased default rates, and weakened borrower creditworthiness. The pandemic variable itself is positive and significant (0.184–0.205, $p < 0.05$), reinforcing the global trend of elevated credit risk stemming from economic disruptions, declining borrower capacity, and liquidity constraints. The results are consistent with theoretical predictions from the competition-stability views in banking, highlighting the nuanced effects of market structure on financial stability.

Table 5. Robustness Check

<i>Variables</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>
Lagged Credit Risk	0.712** (0.042)	0.698** (0.045)	0.705** (0.039)	0.690** (0.041)
Competition (H1, H2)	0.126** (0.058)	-0.139** (0.061)	-0.142** (0.057)	-0.148** (0.059)
COVID-19 (2019–2020)	0.184** (0.076)	0.192** (0.078)	0.198** (0.081)	0.205** (0.083)
Competition $\times$ COVID-19 (H3)	0.230** (0.095)	0.214** (0.091)	0.221** (0.089)	0.218** (0.087)
Bank Size (SIZE)	-0.078** (0.035)	-0.085** (0.038)	-0.081** (0.034)	-0.079** (0.032)
Liquidity (LQD)	-0.014* (0.006)	-0.013* (0.007)	-0.015* (0.006)	-0.014* (0.006)
Capital Adequacy Ratio (CAR)	-0.092** (0.044)	-0.089** (0.042)	-0.095** (0.041)	-0.091** (0.040)
GDP Growth Rate (GDP)	-0.067* (0.028)	-0.071* (0.030)	-0.069* (0.027)	-0.065* (0.026)
Constant	2.114** (0.358)	2.098** (0.362)	2.102** (0.355)	2.086** (0.349)
AR (1) p-value	0.014	0.016	0.013	0.017
AR (2) p-value	0.372	0.354	0.368	0.359
Hansen Test	0.512	0.498	0.521	0.510
Number of Observations	150	150	150	150
Number of instruments	35	35	35	35

Source: Source: Author 2025: Note: ; * $p < 0.01$ and ** $p < 0.05$

CONCLUSIONS AND POLICY IMPLICATIONS

This study provides empirical insights into the interrelationship between market structure, credit risk, and sustainable banking stability in Tanzania's post-pandemic era. Using a dynamic panel data regression model estimated via the Generalized Method of Moments (GMM), the findings reveal that increased banking competition significantly reduces credit risk, supporting the competition-stability hypothesis. The

persistence of credit risk, as evidenced by the significant coefficient of lagged credit risk, underscores the necessity for proactive and sustained risk management practices. Furthermore, the COVID-19 pandemic has had an adverse effect on credit risk, highlighting the vulnerabilities of the banking sector during economic disruptions. The moderating effect of competition on the COVID-19-induced credit risk further demonstrates that well-functioning competitive banking environments can mitigate financial instability. These findings offer crucial implications for regulators, policymakers, and financial institutions in shaping strategies to foster sustainable banking stability in Tanzania.

Theoretical Implications. This study contributes to the existing body of literature on banking stability by reinforcing the competition-stability perspective within the Tanzanian banking context. Contrary to the competition-fragility hypothesis, the findings indicate that increased competition enhances financial stability by improving credit allocation efficiency and risk assessment mechanisms. Additionally, the results underscore the significance of external economic shocks, such as COVID-19, in influencing credit risk, thereby providing new theoretical insights into the role of macroeconomic disruptions in banking stability. These findings call for a reassessment of traditional risk management frameworks to incorporate competition dynamics and external shocks in financial stability models.

Practical Implications. The findings have several practical implications for banking institutions, regulators, and policymakers in Tanzania. First, the negative relationship between banking competition and credit risk suggests that policymakers should encourage a competitive banking environment through regulatory frameworks that promote market efficiency. Second, given the persistence of credit risk, banks should enhance their credit risk management practices by implementing robust early warning systems and stress-testing mechanisms to anticipate and mitigate future risks. Third, the observed impact of the COVID-19 pandemic on credit risk highlights the need for contingency planning and adaptive financial resilience strategies. Regulators should incorporate macroeconomic shock scenarios into risk assessment frameworks to strengthen the sector's ability to withstand future crises. Lastly, policymakers should consider developing financial stability policies that integrate market competition as a critical element in enhancing overall banking resilience.

Limitations and Areas for Future Research. While this study provides valuable insights into the dynamics of market structure, credit risk, and banking stability in Tanzania, it has certain limitations. First, the study focuses solely on large commercial banks, which may limit the generalizability of the findings to smaller banks and microfinance institutions. Future research should incorporate a broader spectrum of financial institutions to capture a more comprehensive picture of the banking sector. Second, the study period, spanning from 2010 to 2024, may not fully capture the long-term structural transformations in Tanzania's banking sector. Extending the study period further could provide deeper insights into the evolving nature of market structure and risk dynamics. Finally, future research could explore the role of technological advancements, such as digital banking and fintech innovations, in shaping credit risk and banking stability post-pandemic.

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