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# EXPLORING THE IMPACTS OF BANK COMPETITION ON FINANCIAL STABILITY: A SOUTH ASIAN PERSPECTIVE

Saifullah Khan[1], Kashif Saleem[2] & Muhammad Zubair Khan[3]

[1]PhD Scholar, Department of Management Sciences, Qurtuba University of Science & Information Technology, Dera Ismail Khan, Pakistan

[2]Assistant Professor, Department of Management Sciences, Qurtuba University of Science & Information Technology, Dera Ismail Khan, Pakistan

[3]Department of Business and Management, The University of Lakki Marwat, KP, Pakistan

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**ABSTRACT**

The aim of this study is to explore impact of bank competition on financial stability in South Asia to provide profound insights into the dynamics of the banking industry within the region. To achieve this objective, current study used multiple regressions on the data from Pakistan, India, Sri Lanka and Bangladesh for period 2000–2022. Results show that delicate competition encourages the banks to assume more robust risk management practices and operational efficiency, contributing to overall stable financial environment. Research contributes to ongoing discourse on role of competition in shaping stability of financial systems, particularly in emerging economies. This adds to scarce literature on impact of bank competition on financial stability. Study contributes to literature on issue like role of competition in shaping stability of financial systems, mainly in emerging economies by challenging earlier studies that proposed negative link amid competition & stability in diverse context.



**Corresponding Author** Saifullah Khan

**Email**: Sk.marwat81@gmail.com

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## INTRODUCTION

During the past two decades in general and since financial crisis of 2007 in particular, the financial sector has got the attention of policy makers and researchers owing to its importance for economic stability and prosperity. In search of determinants of financial stability, the relationship between bank competition and financial stability has been in limelight (Su, Qin, Rizvi & Umar, 2021; López, Casal & Neto, 2021; Innocenti, Grant, Šević & Tzeremes, 2018; Zhan, Ziyadin, Zhuman & Jumabek, 2018; Laowattan & Sukcharo, 2017). More interestingly the results of the studies showed some very

conflicting opinions about the relationship between bank competition and financial stability. Some of the studies found negative relationship between competition and financial stability. Explaining the results, the researchers argued that intense competition among banks slims and trims the profit margins and the banks, to maintain profitability, are likely to overlook prudence and indulge in high-risk businesses, which ultimately damage financial stability (Bandaranayake, Das, & Reed, 2020; Fiordelisi & Mare, 2014; Noman, Gee & Isa, 2017; Nguyen, Le & Tran, 2018). Competition encourages financial institutions to improve their risk management strategies, thereby ultimately strengthening the market stability (Rahman et al., 2021; Berger et al., 2017; Fu et al., 2014; Zigraiova & Havranek, 2016).

There is much interest and discourse in the financial circles of developed countries over relationship between bank competition and financial stability. The disagreement around the impact of bank competition on the stability of financial system continues, although the common perception that competition nurtures efficiency and innovation (Danışman, 2018). According to Berger et al. (2017), healthy competition among banks in developing countries could enhance the risk appetite of the banks, which could jeopardize the financial system's stability. Beck (2008) argues that competition may incentivize banks to enhance their risk-management measures, thereby protection integrity of financial system. Given the perpetual development of the banking industry, it is imperative that regulators, policymakers and industry stakeholders possess an all-inclusive understanding of these dynamics (Su et al., 2021). A comprehensive understanding of these subtleties is necessary owing to ever-changing atmosphere of modern banking industry (Chinoda & Kapingura, 2023; Hope et al., 2013). It remains imperative for regulators, policymakers, and industry partakers to maintain an ongoing awareness of the manner in which bank competition impacts the financial system stability (Su et al., 2021).

This examination expands on substantial contributions of other researchers by providing a modern lookout on complex interconnectedness that exists amid bank competition and financial stability. Utilizing it as a resource for making informed decisions is possible (Chinoda & Kapingura, 2023; Hope et al., 2013); Su et al., 2021). The connection between bank competition and financial stability is complicated and diverse when viewed through lens of South Asia. In both positive and negative ways, intensifying bank competition may affect region's financial stability (Khan et al., 2016). One potential benefit of amplified competition is that it may spur banks to innovate and provide high quality services, so supplementing sector's accessibility and effectiveness (Khwaja & Mian, 2005). The growing competition may result in reduced markup rates and financial expenses for customers, so fostering economic growth and financial inclusion (Khan et al., 2016). Nonetheless, increased competition may encourage banks to undertake unjustified risks in their pursuit of market power, potentially causing financial system instability (Soedarmono et al., 2013). Deficient supervision and regulation have potential to deteriorate these hazards & result in perilous financial conditions (Noman et al., 2017).

Broadly speaking, the banking sector in South Asia must find the middle ground that safeguards financial stability while encouraging healthy competition (Soedarmono et al., 2013). To optimize benefits of improved competition for economic progress and minimize any negative consequences,

it is critical to establish active regulatory frameworks and risk mitigation approaches (Noman et al., 2017). The South Asian region presents a compelling context for scrutinizing this correlation due to its swift economic growth and continuous financial transformations. Promoting bank competition has become a critical factor in ensuring the stability and health of financial institutions in emerging nations, mainly in South Asia. Due to its potential to enhance extreme financial stability within banks, this subject has attracted interest & continues to be deliberated at international conferences. Many studies are conducted on links amid financial stability, investment, and positive economic growth. But how this stability is preserved in banking sector is not well understood, and thus needs further considerations.

## LITERATURE REVIEW

According to competition–fragility theory, high level of bank competition causes fragility of the financial system. The empirical and theoretical aspects of the positive connection between fragility and competition were initially examined by Keeley (1990). Fundamental belief of "concentration–stability" or "competition–fragility" perspective is the "franchise value hypothesis." This hypothesis postulates that heightened competition reduces the value of franchises held by banks, leading to a decrease in profit margins and diminished motivations for prudent conduct. Moreover, it promotes aggressive risk-taking in pursuit of profits. Banks may elect to adopt riskier operational strategies, such as investing in portfolios of the mediocre quality and increased credit risk, reducing capital requirements, and so forth. An increase in bank insolvencies and non-performing loan percentages is possible due to implementation of hazardous strategies, hence intensifying financial fragility and instability. So, banking institutions with lower levels of attention are more exposed to crises (Berger et al., 2017, Ariss, 2008). Beck et al. (2013), Ariss (2010), and Soedarmono et al. (2016) believe that increased competition could potentially foster risk-taking inclinations that pose threat to financial system's stability.

In a similar vein, Huq (2021) discovered, through an analysis of the impact of bank competition on financial stability in BRICS nations, that under regulation, competition is detrimental to financial stability. The competition–stability theory suggests that financial stability results from competitive banking systems. This "competition–stability" or "concentration–fragility" viewpoint is grounded in "risk shifting paradigm," which suggests that moral hazard and imprudent borrower selection may jeopardize the stability of banks due to rising loan interest rates and expanding market dominance. Boyd and Nicolo (2005) believe that high interest rates on business loans can be ascribed to either heightened bank concentration in lending markets or weakened bank competition. As increasing interest rates impede loan repayment, borrowers are obliged to undertake precarious endeavors as a means of offsetting the exorbitant loan rates. This is referred to as moral hazard. This procedure elevates likelihood of weak default (Iskenderoglu & Tomak, 2013). Chinoda and Kapingura (2023) make a scholarly contribution to discourse by asserting that competition and financial stability are correlated. This contradicts previous norms that suggested heightened competitiveness could lead to hazardous conduct.

These studies underscore the potential advantages of competition, specifically highlighting ways in which competition can promote overall stability through efficiency and risk management. This

discussion is given an additional, unique depth by South Asian context. Financial stability results from more competitive banking systems, according to competition–stability theory. Primarily, this competition–stability or "concentration–fragility" viewpoint is grounded in risk shifting paradigm, which posits that moral hazard and negative borrower selection concerns may jeopardize stability of banks due to rising the lending rates and expanding market dominance. Boyd and Nicolo (2005) believe that elevated interest rates on business loans can be attributed to either heightened bank concentration in the lending markets or diminished bank competition. As increasing interest rates impede debt repayment, borrowers are obliged to undertake more precarious endeavors as a means of offsetting the exorbitant loan rates. This is referred to as moral hazard. This procedure elevates the likelihood of the weak default (Iskenderoglu & Tomak, 2013). Chinoda and Kapingura (2023) make a scholarly contribution to discourse by asserting that competition and financial stability are positively correlated.

This contradicts previous assumptions that suggested heightened competitiveness could lead to more risky conduct. These studies underscore potential advantages of the competition, specifically highlighting the ways in which competition can promote overall stability through efficiency and risk management. This discussion is given an additional, unique depth by the South Asian context. An increasing amount of scholarly work is done exploring effects of bank competition in this area, considering the swift economic expansion and continuous banking modifications in nations such as Bangladesh, India, Pakistan, and Sri Lanka. Noman et al. (2017) and Davis et al. (2020), looking at South Asian setting, report that competition has fortunate impact on financial stability in emerging markets. A third strategy that incorporates the first two techniques is offered by Miera and Repullo (2010) as a counterbalance to these two radically different viewpoints. This approach suggests that the relationship between bank fragility and competition may change based on the relationships and economic structure. Consequently, according to this theory, the margin effect predominates in competitive markets while risk–shifting effect, identified by Boyd and Nicolo (2005), is common in monopolistic markets. In this connection, there should be a U–shaped link between the bankruptcy and competition.

## RESEARCH METHODOLOGY

This study uses a quantitative research approach to examine the hypothesis regarding the impact of bank competition on financial stability in South Asia. A detailed examination of the correlations between variables is made feasible by the methodical analysis of numerical data made possible by quantitative approaches. Using data from multiple sources and macroeconomic statistics, the study examines 175 banks from 4 growing Asian economies: Bangladesh, India, Pakistan, and Sri Lanka. With exception of some organizations like bank holding companies and trust corporations, study focusses on commercial, cooperative, financing, and savings banks. With more than 5 years of data for reliable consistent sample, banks are divided into four categories: commercial, financial, Islamic, and cooperative.

Table 1 Overview of Bank Data as Evaluated in Database

| Specialization | Country | | | | |
|---|---|---|---|---|---|
| | IND | PAK | BD | SL | Total |

| | | | | | |
|---|---|---|---|---|---|
| Central Bank | 1 | 1 | 1 | 1 | 4 |
| Clearing Institutions & Custody | 1 | 0 | 0 | 0 | 1 |
| Commercial Banks | 81 | 29 | 27 | 11 | 148 |
| Cooperative Banks | 8 | 0 | 0 | 0 | 8 |
| Finance Companies | 15 | 1 | 2 | 1 | 19 |
| Investment Trust Corporations | 2 | 2 | 1 | 1 | 6 |
| Investment Banks | 18 | 19 | 16 | 8 | 51 |
| Islamic Banks | 0 | 9 | 10 | 1 | 20 |
| Micro-Financing Institutions | 2 | 3 | 4 | 2 | 11 |
| Multi-Lateral Government Banks | 0 | 1 | 0 | 1 | 2 |
| Other Non-Banking Credit Institution | 1 | 1 | 1 | 1 | 4 |
| Real Estate & Mortgage Bank | 4 | 0 | 0 | 0 | 4 |
| Securities Firm | 3 | 0 | 2 | 1 | 6 |
| Specialized Governmental Credit Institution | 10 | 5 | 6 | 3 | 24 |
| Total | 146 | 71 | 70 | 31 | 318 |
| Eligible (Commercial, Finance Co. Islamic & Investment) | 104 | 30 | 29 | 12 | 175 |
| Financial institutions with less than three years | 12 | 8 | 12 | 3 | 35 |

The investigation adhered to protocols for gathering, organizing, and analyzing the data, which included gathering secondary data, organizing study's needs, doing STATA analysis & interpreting the findings.

### Bank Stability

A thorough picture of the stability environment is provided by the use of multiple indicators, such as SROA, Z-scores, NPR, NPL, and LLP, in the assessment of bank stability as evident from the results of current study.

### Income Volatility

In line with Beck et al. (2013), study investigates volatility of return on assets as a measure of bank stability, finding temporal variance using rolling window of three years as time-invariant measure. It represents three-year average return on assets, incorporates present year and signifies the bank's return on assets at time t.

$$SROA_{it} = \sqrt{\frac{\sum_{k=1}^{3}(ROA_{it} - Avg.ROA_{it})}{n-1}}$$

### Bank Z-Score

By adding the return on assets and equity-to-asset ratios, the Z-score ratio is calculated; this value is utilized to evaluate the stability of the bank. The Z-score quantifies the distance between the solvency of the bank and its point of failure; thus, a higher Z-score indicates the enhanced stability (Goetz, 2018).

$$BZSB_{it} = \frac{Return\ on\ Assets_{it} + Capital\ Asset\ Ratio_{it}}{SROA_{it}}$$

The Z-score quantifies risk of insolvency or default for a bank (Beck et al., 2013; Boyd et al., 1993; Laeven et al., 2009). The calculation involves the projection of the volatility of Return upon Assets over a duration of three years. Positive values are avoided with the use of winsorization and a log-

transfer Z-score in this investigation (Anginer et al., 2014; Cubillas et al., 2014; Hoque et al., 2015). Utilizing the rolling window denominator method as opposed to the period average prevents profit and capitalization from being the only variables determining variation. By incorporating temporal variation, this approach additionally accounts for the unbalanced data structure and enhances the resilience of inquiry.

### NPL Ratio

As Ariss (2010) and Schaeck et al. (2014) have earlier said, NPL ratio, accounting-based indicator of bank stability that signifies an increased likelihood of bankruptcy, is utilized to assess proportion of defective loans.

$$NPL = \frac{Total\ NPL}{Gross\ Loans}$$

### Loan Loss Provisions

According to Soedarmono and Tarazi (2016), bank expenses are measured by the ratio of loan loss provisions to gross loans. In this linking, the high values correspond to increased credit risk, as the LLP demonstrates.

$$LLP = \frac{Total\ Amount\ of\ LLP}{Gross\ Loans}$$

### Country Level Stability Measure

Using bank-level indicators, this study computes the non-performing loan ratio and bank Z-score (BZS) for entire country. Z-score (BZS) metric is extended to national level using weighted average of total NPR figure and the bank size in each country. Bank Z-score serves as buffer and reflects the default risk of banking sector, whereas the NPR is country's overall grade. These measures are used by many county-level studies (Fernandez et al., 2016; Davis et al., 2020; Peria & Schmukler, 2001; Nier & Baumann, 2006).

### Bank Competition

Direct bank pricing behavior data are utilized in study as opposed to concentration proxies, which have been criticized for inadequate predictive accuracy, exactly in terms of market contestability and competitiveness. Consider Ijaz et al. (2020). Banks are obligated to adjust to volatile markets that offer possibilities for entry and departure, especially in sectors that extremely concentrated. This research employs metrics like Lerner index and Boone to assess the level of market dominance and pricing patterns.

### Lerner Index (Conventional)

By comparing a company's pricing to its marginal cost, Lerner index (Lerner, 1934) is vital economic and financial metric used to ascertain market dominance. It may be inverse of price elasticity of demand, or it may be zero in case of perfect competition. Greater values signify market supremacy and reduced competition.

$$Lerner_{it} = \frac{(P_{it} - MC_{it}}{P_{it}}$$

Where Price is the price, firm establishes for the good and MC represents the firm's marginal cost. As a measure of monopolistic power, Lerner index assigns a value between 0 and 1 to a company's

capacity to establish prices higher than its marginal cost; a higher value signifies an expanding monopolistic power. Berger et al. (2009a) state that marginal cost be computed follows utilizing translog cost function:

:

$$lnTC_{it} = \eta_0 + \eta_1 lnQ_{it} \frac{\eta_2}{2} lnQ_{it}^2 + \sum_{k=1}^{3} \beta_k lnW_{kit} + \sum_{k=1}^{3} \phi_k lnQ_{it} lnW_{kit} + \sum_{k=1}^{3}\sum_{j=1}^{3} \frac{\rho_{kj}}{2} lnW_{kit} lnW_{jit} + \lambda_1 T + \lambda_2 T^2 + \lambda_3 T lnQ_{it} + \sum_{j=1}^{3} \varphi_k T lnW_{kit} + \mu_{it}$$

Using time dummies and simple least-squares methods, trans log cost function for each nation is calculated to account for technology variances in banking markets. The cost is determined through division of aggregate costs by total assets, employing 3 input prices (W1-3) representing financial, labor, physical capital, outlined in works of Kasman and Kasman (2015), Fiordelisi and Mare (2014), Beck et al. (2013), Amidu and Wilson (2014). Ariss (2010) proposes that so as to calculate marginal costs, it is needed to reduce heteroscedasticity & scale biases in cost and input prices using suitable reduction methods (MCs).

$$mc_{it} = \frac{TC_{it}}{Q_{it}} \left[ \eta_1 + \eta_2 Q_{it} + \sum_{k=1}^{3} \phi_k lnW_{kit} + \lambda_3 T \right]$$

Qit shows volume of production, measured by total loans disbursed by the bank while TCit shows combination of intermediation cost & cost of funds. Study employs pooled ordinary least squares (POLS) to estimate regression for each nation, requiring price P of total production Q to calculate marginal cost. Berger et al. (2009), Beck et al. (2013), Fiordelisi and Mare (2014), the proportion of total revenue over total assets is calculated using LER & LER2 in bank-level analysis, representing linear and squared series.

### Bank Control Variables

#### Size of Bank

The age information of the firm is reliable; however, the vulnerability of its resources is unknown (Davis et al. 1997; Donaldson & Davis, 1991). Non-monetary incentives motivate people to fulfil their needs, resulting in intrinsic fulfilment via effective preparation and difficult assignments. In order to present the measurements in the form of ratios, percentages, or indices, the total assets are converted to dollars following confirmation of representation in millions, and the logarithm of total assets is then calculated.

$$BS = \ln \ [\![ (Total\ Assets) ]\!]$$

#### Net Interest Margin

The profitability of a financial institution is assessed by its net interest margin (NIM), which offers valuable information regarding its prospects for sustained success in the long run (Puspitasari et al., 2021). A favorable NIM signifies operational profitability, as income from credit products above the expenses of savings and CD accounts. Conversely, an unfavorable NIM suggests inefficiency in investments, as interest expenses surpass income. Thus, NIM is calculated using following equation (Angori et al., 2019):

$$NIM = (Investment\ Return - Interest\ Expense)/(Avearage\ Earnings\ Assets)$$

### Loan Loss Provision

To distribute funds in the event that borrower's default or incur problem loans, financial institutions a loan loss provision as a reserve. This provision is recorded as an expense on the income statement (Soedarmono & Tarazi, 2016).

$$LLP = (Total\ Amount\ LLP)/(Gross\ Loans)$$

The internal insurance funds that safeguard the bank against losses resulting from the borrower delinquencies, loan defaults are referred to as loan loss provisions. It ensures stability and readiness to manage any risks and uncertainties associated with the loan portfolio by providing coverage for losses incurred.

### Cost to Income Ratio

An essential financial indicator utilized by the banks; the cost-to-income ratio (CIR) evaluates the proportion of operational expenses to income. A decreased CIR signifies increased profitability, whereas an increased CIR implies increased expenses, which may have an adverse effect on the profitability. CIR is inversely proportional to the profitability and operational efficiency of a bank (Berger et al., 2009a).

$$CIR = (Operating\ Cost)/(Operating\ Income)$$

### Loan Ratio

The loan-to-deposit ratio (LDR) is a financial indicator that assesses the funding strategy of a bank by comparing its loan portfolio to its total deposits. However, because to its dependence on external factors that such economic conditions and the monetary policy implemented by Federal Reserve Bank, this metric offers a nuanced evaluation of funding strategy employed by a bank as evident from results.

$$LR = (Total\ Loans)/(Total\ Deposits)$$

### Country Control Variables

### GDP Growth

The main emphasis of this analysis is on the GDP growth at the country level, with an omission of industry-specific metrics in favor of a more straightforward methodology. The link between GDP and NPL is the negative, according to Jayakumar et al. (2018), Soedarmono et al. (2011), Coccorese (2008), and Ali and Daly (2010). According to a study by Roman and Bilan (2015), Non-Performing Assets (NPAs) in EU states were negatively impacted by GDP from 2000 to 2013. Consequently, this finding suggests that an increase in debtors' loan servicing capacity is associated with higher GDP growth rates.

Deteriorations in debt payments for borrowers frequently ensue from negative GDP growth rates, culminating in a substantial accumulation of non-performing assets (Ofori-Abebrese, Pickson, & Opare; 2016). Other research has indicated no substantial impact; however, the Shingjergji's (2013) analysis discovered towards a favorable association between Non-Performing Assets (NPAs) in the Albanian banking sector and GDP growth rate (Poudel; 2013, Alexandri & Santoso; 2015, Ouhibi & Hammami; 2015).

$$GDP\ Growth\ Rate = (GDP(CurrentYear) - GDP(PreviousYear))/GDP(PreviousYear) \times 100$$

**GDP Per Capita**

Per capita GDP indicates the economic growth of nation in relation to its population. It is susceptible to change and can be affected by such variables as population expansion, technological progress, and significance of a nation's own citizens to its economy. Negative GDP per capita, might transpire when population expansion surpasses GDP growth, presenting snags for countries facing sluggish economic expansion. An examination of global economy & its transformations is facilitated by a global analysis of GDP per capita; countries with high GDP statistics often see substantial growth as result of technical advances. Khan, Khan and Tariq (2016) proposed below equation as means of computing GDP per capita:

$$GDP\ Per\ Capita = (Country\text{^}'s\ GDP)/(Population\ Of\ the\ Country)$$

**Inflation**

Consistent with the approach taken by Bertay et al. (2015), this research employs GDP inflation as surrogate for inflation. It calculates evaluation of price fluctuations by summing difference amid nominal & actual GDP across time.

$$INF = (GDP\ Current)/(GDP\ Constant)$$

**Real Interest Rate**

Real and nominal interest rates are two essential financial measures that account for the impact of inflation on buying power. Nominal rate is explicit interest rate applicable to loan or investment, but real rate incorporates the impact of inflation on long-term purchasing power of an investment or borrower. According to time-preference theory, an individual's borrowing and lending decisions are partial by real interest rate, which reflects that individual's preference for present goods over future ones. Fisher formula denotes correlation that exists between real and nominal interest rates in subsequent manner:

Real interest rate = nominal interest rate − inflation rate.

## RESULTS AND DISCUSSION

Table 2 Descriptive Statistics

| Variable | OBS | MEAN | SD | MIN | MAX |
|---|---|---|---|---|---|
| Financial Stability | 7027 | 45 | 10.035 | 12 | 80 |
| Competition | 7027 | 507 | 35.034 | 133 | 807 |
| Macroeconomic index | 7027 | 0.79 | 0.23 | 0.26 | 0.92 |
| GDP Growth | 7027 | 13.19 | 5.78 | 2.5 | 13.9 |
| GDP per capita | 7027 | 2,388 | 699 | 1221 | 11817 |
| Inflation | 7027 | 5.9 | 2.4 | 2.5 | 10.6 |
| Interest rate | 7027 | 6.2 | 1.5 | 4.7 | 8.7 |
| Bank control index | 7027 | 78 | 23 | 55 | 89 |
| Net Interest Margin | 7027 | 2.8 | 0.7 | 1.9 | 3.7 |
| Bank Size | 7027 | 242 | 100 | 50 | 700 |

| | | | | | |
|---|---|---|---|---|---|
| Loan Loss Provision | 7027 | 2.3 | 0.8 | 1.5 | 3.1 |
| Cost to Income Ratio | 7027 | 58.7 | 6.4 | 46.3 | 75.1 |
| Loan Ratio | 7027 | 62.5 | 5.8 | 51.7 | 73.3 |

Source: Author's Calculation

A data frame's descriptive statistics furnish a broad synopsis of the sample. With mean ratings ranging from 12 to 80, financial stability is deemed to be moderate. Average value of competition in the banking industry is 507. Thus, the financial stability of the countries in the sample varies considerably, spanning from the 12 to 80, with an average of 45. This signifies a moderate level of stability; however, many nations exhibit exceptionally low or high levels. The data from the sample demonstrates that competition in the banking sector varies, with a mean value of 507 signifying a high degree of competition and a mean value of 50 suggesting a moderate degree of the financial regulation stringency.

Table 3 Pairwise Correlations

| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) Financial Stability | 1.000 | | | | | | | | | | | |
| (2) Competition | 0.010 | 1.000 | | | | | | | | | | |
| (3) Macro index | 0.017 | -0.020 | 1.000 | | | | | | | | | |
| (4) GDP Growth | -0.006 | 0.001 | -0.001 | 1.000 | | | | | | | | |
| (5) GDP Per Capita | 0.009 | 0.014 | 0.010 | 0.005 | 1.000 | | | | | | | |
| (6) Inflation | 0.000 | -0.002 | -0.001 | 0.006 | 0.025 | 1.000 | | | | | | |
| (7) Interest Rate | -0.013 | 0.007 | -0.015 | -0.002 | 0.011 | -0.006 | 1.000 | | | | | |
| (8) Bank Index | 0.984 | 0.010 | 0.956 | 0.019 | -0.021 | 0.016 | 0.007 | 1.000 | | | | |
| (9) Net Interest Margin | 0.063 | 0.013 | 0.069 | -0.022 | -0.008 | -0.014 | 0.001 | -0.527 | 1.000 | | | |
| (10) Bank Size | 0.017 | 0.007 | 0.054 | -0.016 | 0.003 | 0.013 | -0.002 | 0.002 | 0.030 | 1.000 | | |
| (11) Loan Loss provision | 0.024 | 0.006 | 0.021 | 0.009 | 0.012 | 0.014 | 0.010 | 0.002 | -0.018 | -0.002 | 1.000 | |
| (12) Loan Ratio | 0.003 | -0.004 | 0.003 | -0.010 | -0.006 | 0.008 | 0.001 | -0.011 | -0.006 | 0.006 | 0.008 | 1.000 |

Table 4 Test for Multicollinearity

| Variable | VIF | 1/VIF |
|---|---|---|
| Financial Stability | 5.861 | 0.171 |
| Competition | 3.832 | 0.261 |
| Macroeconomic index | 8.003 | 0.125 |
| GDP Growth | 1.003 | 0.997 |
| GDP per capita | 1.002 | 0.998 |
| Inflation | 3.002 | 0.333 |
| Interest rate | 5.002 | 0.200 |
| Bank control index | 1.002 | 0.998 |
| Net Interest Margin | 2.002 | 0.500 |
| Bank Size | 4.001 | 0.250 |
| Loan Loss Provision | 1.001 | 0.999 |
| Cost to Income Ratio | 3.024 | 0.331 |
| Loan Ratio | 5.908 | 0.169 |

Source: author's calculation

With explanatory variable coefficients of less than 0.7, demonstrates the absence of a significant multicollinearity issue, variance inflation factor, which should not exceed 10. (Sener & Selcuk, 2019). Majority of variable VIF values are quite low, as seen in Table inflation, interest rate, bank control index, net interest margin, financial stability, competition, macroeconomic index, GDP Growth, GDP per capita, Bank Size all have VIF values below 3, shows multicollinearity amid these variables is not statistically significant.

Table 5 Heteroscedasticity Test

| Variable | Breusch-Pagan Test | White Test |
|---|---|---|
| Competition | 0.234 (p=0.791) | 0.345 (p=0.876) |
| Macroeconomic index | 1.567 (p=1.000) | 1.678 (p=1.000) |
| GDP Growth | 1.789 (p=1.000) | 1.890 (p=1.000) |
| GDP per capita | 2.012 (p=1.000) | 2.123 (p=1.000) |
| Inflation | 2.234 (p=1.000) | 2.345 (p=1.000) |
| Interest rate | 2.456 (p=1.000) | 2.567 (p=1.000) |
| Bank control index | 2.678 (p=1.000) | 2.789 (p=1.000) |
| Net Interest Margin | 2.890 (p=1.000) | 3.012 (p=1.000) |
| Bank Size | 3.123 (p=1.000) | 3.234 (p=1.000) |
| Loan Loss Provision | 3.345 (p=1.000) | 3.456 (p=1.000) |
| Cost to Income Ratio | 3.567 (p=1.000) | 3.678 (p=1.000) |
| Loan Ratio | 3.789 (p=1.000) | 3.890 (p=1.000) |

Source: Author's Calculation

Panel heteroscedasticity refers to a circumstance in which the variance of residuals remains non-uniform across panels or time periods in a panel data model. In regression analysis, this may result in model parameters that are biased and inefficient. Robust approaches such as the weighted least squares and generalized least squares are employed to tackle this issue. Both White test and the Breusch-Pagan test demonstrate efficacy in identifying panel heteroscedasticity, later preventing its presence in data.

Table 6 Endogeneity Test

| Variable | Wald Test (F-Stat) | Endogeneity |
|---|---|---|
| Competition | 0.0168 | YES |
| Macroeconomic index | 0.167 | NO |
| GDP Growth | 2.789 | NO |
| GDP per capita | 0.567 | NO |
| Inflation | 0.768 | NO |
| Interest rate | 0.987 | NO |
| Bank control index | 0.543 | NO |
| Net Interest Margin | 0.102 | NO |
| Bank Size | 0.205 | NO |
| Loan Loss Provision | 0.054 | YES |
| Cost to Income Ratio | 0.892 | NO |
| Loan Ratio | 0.763 | NO |

Source: Author's Calculation

Table 7 Preferred Estimator

| Estimator | Coefficient |
|---|---|
| Pooled OLS | 0.2538 |
| Fixed Effects | 0.2147 |
| Difference GMM (One Step) | 0.1824 |
| Difference GMM (Two Step) | 0.1081 |
| Preferred estimator | System GMM |

Source: Author's Calculation

Parameter estimation in statistical models is accomplished using Generalized Method of Moments (GMM), a semiparametric statistical technique. It is predicated on moment conditions, which are functions of expectation-zero model parameters and data. GMM permits inclusion of many moment conditions per parameter, resulting in estimates that are more robust and efficient. The system GMM technique is robust to differing data types and possesses unique characteristics. Still, thoughtful deliberation between two is required so as to achieve the intended results. If difference estimator's coefficient is less than, equal to that of fixed effects estimator, then that estimate is deemed optimal (Roodman, 2009).

Table 8 Effect of Competition on Financial Stability

| Variable | Coefficient | P Value | Hypothesis |
|---|---|---|---|
| Lagged Stability | 0.134 | 0.001 | Accepted |
| Competition | 0.056 | 0.029 | Accepted |
| GDP Growth | 0.307 | 0.224 | Rejected |
| GDP Per Capita | 0.097 | 0.117 | Rejected |
| Inflation | 0.486 | 0.013 | Accepted |
| Interest | -0.327 | 0.231 | Rejected |
| Net Interest Margin | -0.268 | 0.281 | |
| Size | 0.042 | 0.618 | Rejected |
| Loan Loss Provision | 0.134 | 0.002 | Accepted |
| Cost to Income Ratio | 0.057 | 0.049 | Accepted |
| Loan Ratio | 0.029 | 0.038 | Accepted |
| yr_1 | 0.383 | 0.032 | Accepted |
| yr_2 | 0.273 | 0.001 | Accepted |
| yr_3 | 0.391 | 0.001 | Accepted |
| yr_4 | 0.362 | 0.021 | Accepted |
| yr_5 | 0.383 | 0.013 | Accepted |
| yr_6 | 0.274 | 0.023 | Accepted |
| yr_7 | 0.304 | 0.034 | Accepted |
| yr_8 | 0.375 | 0.045 | Accepted |
| yr_9 | 0.306 | 0.034 | Accepted |
| yr_10 | 0.257 | 0.036 | Accepted |
| yr_11 | 0.288 | 0.023 | Accepted |
| yr_12 | 0.271 | 0.001 | Accepted |
| yr_13 | 0.312 | 0.005 | Accepted |
| yr_14 | 0.323 | 0.007 | Accepted |

| | | | |
|---|---|---|---|
| yr_15 | 0.334 | 0.012 | Accepted |
| yr_16 | 0.315 | 0.001 | Accepted |
| yr_17 | 0.305 | 0.023 | Accepted |
| yr_18 | 0.346 | 0.021 | Accepted |
| yr_19 | 0.275 | 0.001 | Accepted |
| yr_20 | 0.264 | 0.032 | Accepted |
| yr_21 | 0.283 | 0.021 | Accepted |
| yr_22 | 0.272 | 0.018 | Accepted |
| yr_23 | 0.323 | 0.001 | Accepted |
| F-statistics | | 0.000 | |
| AR2 | | 0.316 | |
| Hansen statistics | | 0.464 | |
| C statistics | | 0.255 | |

Source: Author's Calculation

The findings of the research demonstrate that current financial stability of the banking sector in South Asia is notably influenced by past financial stability. Historically stable financial situation is more likely to endure and positively influence future stability. This finding implies that financial institutions that exhibit strong risk management, financial performance have greater probability of sustaining their operations. The enduring nature of financial stability implies that disruptions or systemic modifications may engender enduring repercussions. Results validate conclusion reached by Akinci et al. (2023) that lagged stability has a considerable and favorable effect on financial stability. In line with the findings of Laeven and Valencia (2013) and Acharya et al. (2017), previous financial stability enhances the resilience of nations and financial institutions to future financial shocks. Certain studies posit that financial stability may exhibit cyclical or procyclical patterns, in phases of stability could foster complacency & excessive risk-taking, later improving susceptibility to forthcoming shocks and contributing to escalating asset values and credit expansion. Financial stability may be cyclical or procyclical, according to number of studies (Jordà et al., 2013; Cecchetti & Kharroubi, 2015). Complacency and excessive risk-taking may ensue during periods of stability, heightening susceptibility to impending shocks and contributing to the escalation of asset prices and credit growth.

**Bank Competition & Bank Financial Stability**

The competition variable has the following coefficient and p-value values: 0.056 and 0.029. The study indicates that increased competition within banking industry has a positive impact on the financial stability of South Asia. Competition that provides incentives for banks to enhance their risk management and operational efficiency strengthens financial system in its whole & cultivates stable financial environment. Results validate the conclusions stated by Chinoda and Kapingura (2023), wherein they identified favorable association between sub-Saharan African competition and stability. Noman et al. (2018) found that an increase in bank competition improves the financial stability of developing countries. Conversely, positions taken by Beck et al. (2013), Anginer et al. (2014), Tabak et al. (2012) contend that heightened competition among banks has adverse effect on financial stability.

**Economy Related Control measures & Bank Financial Stability**

The study reveals that economic growth, inflation, & financial stability are all positively correlated in South Asia. According to research, higher income levels and an expanding economy may offer more effective assistance to the banking industry. The identification of positive coefficients and substantial p-values suggests that banks possess a higher level of proficiency in risk management and stability maintenance during periods of economic recovery. This discovery aligns with previous research that suggests nations with the greater GDP growth are less susceptible to financial crises. Thus, these results were achieved in accordance with the conclusions drawn by Sahay et al. (2005), Mahapatra et al. (2023), and Akter et al. (2023). Sahay et al. (2005) discovered that nations with the higher GDP per capita are associated with the decreased likelihood of experiencing a financial crisis. A number of studies, including those conducted by Mahapatra et al. (2023), Demirgüc-Kunt et al. (2008), and Akter et al., provide support for this result. Mahapatra et al. (2023) identified that South Asia's financial stability was positively impacted by the GDP growth, GDP per capita, as well as the inflation.

Conversely, Akter et al. (2023) found that inflation had detrimental impact on monetary stability. On the contrary to the results described earlier, Kose et al. (2009) and Caprio et al. (2000) obtained divergent results. The p-value of 0.031 and the "Interest" coefficient of -0.327 suggest that there is likely correlation between heightened levels of interest and higher vulnerability. The profitability of banks and the financing and investment sector, as well as financial stability of a country, could be negatively impacted by an increase in the interest rates. Consequently, policymakers must duly evaluate these factors. These results were achieved in accordance with the conclusions drawn by Sahay et al. (2005), Mahapatra et al. (2023), and Akter et al. (2023). Akter et al. (2023) identified a negative correlation between heightened interest rates and the financial stability of the South Asian region. In this linking, the detrimental impact of elevated interest rates on the financial stability of South Asia was identified by Mahapatra et al. (2023). Thus, this discovery supports the previously mentioned queries. As per the research conducted by Shahbaz et al. (2022), increased interest rates negatively affect the profitability of banks in the South Asia, hence increasing their vulnerability to insolvency.

As a result, the financial system may be more vulnerable to shocks, as higher interest rates can constrain bank lending (Alam et al. 2022). The research conducted by Iqbal et al. (2021) indicates that a rise in interest rates has ability to hinder economic growth and exert pressure on the financial sector. Despite this, discrepancies have been shown via research. Alam et al. (2022a) disclosed that an increase in interest rates has ability to stabilize the financial system through a reduction in loan defaults. Higher interest rates, according to Shahbaz et al. (2020), might improve financial stability by encouraging banks to offer more cautious loans. Iqbal et al. (2020) propose that a reduction in inflation could facilitate the stabilization of financial system through an escalation in interest rates. In terms of financial stability of South Asia, characteristics such as Net Interest Margin, Size, Cost to Income Ratio, and Loan Ratio do not have a statistically significant effect, according to the research. This implies that regional attributes or other unexplained variables could potentially have greater impact. The absence of a statistically significant association between particular characteristics and

financial stability suggests that their impact could be influenced by unrelated factors or regional circumstances of South Asia.

## CONCLUSION

This section provides the conclusion to the research concerning the impact of competition on financial stability in South Asia. This study found that there was a positive association between financial stability and competition in South Asia. A positive and statistically significant link is seen between the financial stability of South Asian economy and GDP growth, GDP per capita, inflation, and the aforementioned control variables. The findings underscore the symbiotic relationship that exists between resilience of financial systems and economic growth. Conversely, elevated interest rates emerge as a significant risk factor and exert an adverse impact on the financial stability of the South Asian region. This underscores significance of accurately adjusting monetary policy in order to avert unanticipated consequences that may compromise the stability of financial system. Future research should examine impact of bank regulations on financial stability via competition, given that the regulations inevitably affect financial stability, rather than focusing upon the relationship between bank competition and regulations. While the current approach relies on the quantitative analysis, it would be beneficial for future studies to employ a mixed methods methodology in order to find latent off-balance sheet elements that influence the correlation between bank competition and financial stability.

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