Profitability, Efficiency, and Leverage as Drivers of Financial Stability: Evidence from the Banking Sector

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ABSTRACT

By examining the financial stability of commercial banks in Pakistan, the paper reflects on the tie between the efficiency in operations, profitability and leverage against the stability of commercial banks in an emerging market. The analysis of panel data that considers 31 commercial banks in the 2019-2023 period is made using the random effect panel regression model that is validated by carrying out the Hausman test. A composite measure of the insolvency risk which is measured in the form of Z-score is being considered as a measure of the stability of the bank. The empirical evidence reveals that operational efficiency and leverage are associated with better bank stability. However, net interest margin illustrates insignificant effect hence stating that profitability based on the traditional measurement does not affect bank stability under flux macroeconomic conditions. The findings also confirm that big banks enjoy better stability i.e. because the economies of scale, risk diversification and higher capital buffer. The study underscores the importance of bank-specific factors that lead to financial stability. The study also highlights need to focus of these factors to maintain bank's financial stability. The study fills reveal gap by revealing the factors that lead to stability in Banking Sector of Pakistan. The results offer valuable information for banking professionals, policy makers and regulator. Future researches can extend this study by adding more factors that affect bank stability or by making an Islamic versus conventional bank analysis to find key differences in the determinants of stability.

Keywords: *Bank Stability, Banking Sector, Leverage, Operational Efficiency, Profitability.*

INTRODUCTION

Financial institutions play a pivotal role in ensuring economic stability (Almasri et al., 2025). Among financial institutions, banks are vital for sustainable development of a country (Rana et al., 2025). Financial system resilience largely depends on the stability of banking institutions. Identifying the variables that impact a bank's stability has become a key issue in the new banking environment, especially with the increasing number of financial relationships worldwide. The perception of bank stability indicates the ability of the financial institution to succeed in its business not only during accelerated economic periods but also to manage associated risks (Adrian & Shin, 2010; Islam et al., 2020; Rana et al., 2025). In recent years, banks have faced unforeseen challenges due to the technological revolution, regulatory changes, and economic fluctuations (Alfawareh et al., 2025; Ha & Dang, 2026). Evidence on bank stability is limited in developing economies (Ha & Dang, 2026). Accordingly, it is important to examine the variables of profitability, operations and leverage using a fine-grained comparison when evaluating the ability of a bank to stand firm or not.

Mosharrafa (2022) research provides evidence that profitability is one of the pivots of the financial health since it reveals how effectively a bank can earn adequate returns that allow it to finance its operations and overcome any economic shocks (Engle et al., 2014; Said & Tumin, 2011). The reinvested earnings allow the banks to become competitive in terms of innovation and outstanding services to the customers with an enhanced capital base absorbing the losses and supporting growth initiatives.

Cost minimization, service enhancement, and market niche define the efficiency of operations (Islam et al., 2020). Offering superior value at the same price point for consumers and improving resource utilization enable banks to compete effectively with rivals. This process is increasingly automated and carried out through digital technology, making operations more robust and faster (Jamal & Riaz, 2024). Leverage, on the other hand, is usually illustrated by debt-to-equity ratios and the role they have in increasing the amount of activity that the banks may engage in due to the use of borrowed funds. As much as leverage has the benefit of increasing the level of profitability due to the increase in the asset lending base, it comes with increased risks particular in the declining market where the asset cannot pay, thus liquidity could be under pressure. To keep financial distress to minimum and the situation at bay, prudent leverage is crucial (Adrian & Shin, 2010).

The factor that contributes to stabilizing economy through investment, savings and financial intermediation channel is the banking sector since it is the pulse through which the economy takes place. The recent past world based and regional financial crises however have led to the weaknesses of the banking systems to appear and this has been particularly the case with the emerging economies such as Pakistan.

These crises bring to light, structural protective measures, which include bad profitability, ineffective operations and excessive mortgage usage. It is a given that the banking industry in Pakistan is prone to the variability of changes as dictated by fluctuations in macroeconomic indicators like inflation rate, the exchange rate and policies (Mehzabin, 2023; Jamal & Riaz, 2024). Additionally, it is also more probable that majority of the developed economies will use the complex financial products and good regulatory benchmarks than the financial institutions available in the developing economies that will always have a scenario of restrained resources and ineffective functionality. Such differences give reason to require some situational studies on what factors influence stability particularly in countries such as Pakistan where little effort has been exercised.

Profitability and operational efficiency and leverage cannot be mentioned as separate entities because there exists a relationship between them hence creating some of their exclusive issues that might require a wide scope of knowledge to mitigate risks and enhance resilience. Engle et al. (2014) are also of the opinion that the presence of operational inefficiencies resulting in an upsurge in non-interest expenses is a predisposing factor causing banks and the consequential inability to compete favorably. Leverage contemptuously intensifies the risk-taking opportunities whenever there are financial engagements beyond what is reasonable. This is quite noticeable in the situation with Pakistan, that is, in a frantic environmental context of its parliamentary games and external jolts. Consequently, all the correlations between them should also be considered and assist in closing the gap in the knowledge that has already been available to improve resilience within the banks in the emerging markets (Jamal & Riaz, 2024).

The issues that are likely to be faced by Pakistan include extremely high costs of operations and concrete fluctuating economic position that remains unarticulated in the existing articles. Moreover, there is a scarcity of studies to determine the optimal leverage ratios limit on the emerging markets, and this establishes the need to guarantee tangible methodologies to assess balance and stability in the banking sectors (Alemayehu & Belete, 2019; Santoso et al., 2024). Over the last twenty years, Pakistan's banking

system has undergone a significant number and variety of changes related to financial regulation, technological advances and economic fluctuations. As such, there is a need to identify the determinants of bank stability in this dynamic environment. The aim of this research project is to investigate the main drivers of the stability of banks in Pakistan.

LITERATURE REVIEW

Utilizing Stability and profitability of the bank

Bank profitability plays a vital role in shaping its overall stability and well-being, making it one of the most critical indicators of financial health (Berger & Bouwman, 2013). The profitability is a bailout in case of bad conditions (Usman et al., 2024; Athanasoglou et al., 2008).

Theoretically, high profit would give the banks more power to raise their own finances and less money by using loans or any other source of finances, in that they will be able to sustain themselves through financial crises that might strike them unexpectedly (Molyneux & Thornton, 1992). It has a reserve capital and they get the reserves to work as the shock absorbers at the time of the crisis (Jokipii & Milne, 2008). Consistent profitability allows the banks to enhance their immunity to the monetary jolt since profits will be reconverted to the infrastructures, and also straightening out processes (Engle et al., 2014).

Stability in the developed countries is linked to profit, since it can bring about the nature of resourcefulness, in addition to enhancing economic development (Usman et al., 2024).The contrary is true in the developing area due to the poor economy in the developing nations generally. Profitability may be referred to as one of the strongest aspects of stability across the banks of South-East Asia, even though there is some concern attributed to currencies and issues that concern economic uncertainty (Morgan et al., 2018).

Aim of any banks is earn profits regularly (Gutiérrez & López-Puertas, 2025). Profitability is quite relevant and specifically whenever we talk about the developing nations such as Pakistan; profitability should be regarded as an indicator of success; this is not only a tool of survival in the dynamic world of economics. Abbas and Hassouni (2024) lay the ground that the effective banks are able to realize the macroeconomic shocks like inflation, exchange rates impact and policy changes in an effective way. These stable banks can absorb losses and support loans and liquidity during the hellish economic conditions, and ensure that their money is not wasted during the recession period.

Uncertain environment can deter financial health of a bank (Tran et al., 2025). The profitability and the resulting growing stability also decreases the degree of credit and liquidity risks. The latter is able to adopt and maintain advanced ways of risk management and bear the loss of bad loans (NPLs). According to the evidence provided by Engle et al. (2014), in particular, profitable banks can differentiate the revenues and minimize its dependency on volatile sources of revenues, such as foreign exchange revenues (Fu et al., 2014). Such diversification will have the effect of increasing stability and exposure to less systemic risk. Besides this, this is the motivation to keep abreast with the Basel III and other regulations in terms of capital regulations owing to the benefits gained in terms of profitability. They include the following; presence of tight capital buffer to enable countering credit, market as well as operational risks (Ha & Dang, 2026). These demands can be met by the profit-making banks in Pakistan in a more effective manner, which prepares stabilization in a very tightly controlled setting (Jamal & Riaz, 2024).

Profitability also contributes to a bank's ability to establish a competitive advantage, which is closely linked to its stability. Banks with higher profitability can invest in innovation, enhance customer

services, and expand into new markets, thereby creating greater value for stakeholders. The competitive advantage in the degree of profitability leads to customer loyalty, a low customer turnover rate, and helps to achieve the increased level of stability in the framework of the long-term perspective. Since the intensity of competition within the banking sector in Pakistan is high, profitability will lead to the differentiation dimension of the banking firms, which is based on high-quality goods in the market, coupled with the incorporation of technology. Buffer Capital Theory indicates that banks with more profits will be able to retain more of their earnings, resulting in a stronger capital buffer than necessary. A stronger capital buffer allows the bank to better absorb unanticipated losses as well as increase the bank's overall stability.

H1: Profitability has a positive effect on bank stability.

Operational Efficiency and Bank Stability

The efficient management of the resources helps the banks to cut down their operating costs without compromising on the quality of their services, which they need to sail through the turbulent economic times. The concept of operational efficiency can be regarded as the ability of a particular bank to get the optimum results using the least number of resources (Gomez-Gonzalez et al., 2023). It is essential for bank to remove inefficiencies from their system (Ltaifa & Derbali, 2026).

The efficiency cost hypothesis explains that efficient banks have higher chances of conquering their competitors because they achieve a low cost-income ratio. This, in its turn, promotes higher stability (Linnenluecke et al., 2016). Due to the efficiency in the operations of banks, they possess a competitive advantage by utilizing the resources they have, making them immune to external shocks. When cost-to-income ratios are low, it indicates that the elements contributing to the efficiency of the financial activities of economic firms are sustainable, which is attributed to their financial soundness (Volz et al., 2019). This is further compounded by the fact that emerging economies have further deteriorated their financial exposures due to structural inefficiencies and inadequate resources to counteract these issues (Abdullah, 2024). Similar to manual work and underutilizing technology, it has also been discovered that the high operational costs of the banking sector in Pakistan are the primary factors hindering the growth and stability of the sector (Jamal & Riaz, 2024).

The digital transformation has the capacity to help a bank to improve on performance of its operations in terms of operational efficiency, including optimization of its processes, and cost reduction. The remaining possible empowering technologies, which are recently welcome in the international banking world, are: the implementation of blockchain, the automation of process robots (RPA technology), and Artificial Intelligence (AI) to guarantee the delivery of better efficiencies and a reduction in the error rate level (Kweh et al., 2022).

The digital banking process has helped Pakistani banks to reduce their cost base and facilitate financial inclusion by reducing the operational activities of the physical Branch (Jamal & Riaz, 2024). This has contributed to easy accessibility of their services to both the customers and also the provision of extra services to the customers, which in turn manifests in structural resilience to the dynamics in the economy (Nguyen, 2023). The logical outcome of the suggested improvements is the increased level of client satisfaction and retention, therefore, directly impacting the stability of an entity and the firmly linked to the functioning of the operational procedures on its own account. Well-equipped banks are believed to be able to sustain stability effectively in the competitive environment in Pakistan, as there is a fast-paced strategy present that can enable the achievement of effective fulfillment of the customer expectation, which is the consequence-driven business envisaged based on the effectiveness of the operations at the banks. To be

able to have the ability of sustaining the operational efficiency and market leadership, banks achieve operational efficiency as having a sustained competitive advantage.

Operational efficiency is strongly associated with how banks handle market and liquidity risks. Efficient banks allocate resources more effectively toward activities like asset diversification and credit assessment, reducing exposure to losses. Research indicates that such proactive management improves institutional resilience and regulatory alignment. As a result, responsive banks can adapt effectively without resorting to hasty policy changes that could otherwise lead to penalties or financial crises. According to Buffer Capital Theory, operating more efficiently reduces operational expenses and allows for better use of existing resources; this results in increased earnings, which are sustainable. The additional earnings produced by increasing operational efficiency create larger retained earnings, and consequently, larger capital buffers that help maintain the financial soundness of banks.

H2: Operational Efficiency improves bank stability

Bank Stability and Leverage

Leverage can act both as a potential source of financial vulnerability and as a catalyst for growth, as it plays a crucial role in determining a bank's stability and overall success. It is commonly represented by the debt-to-equity ratio, which measures the extent to which a bank depends on borrowed funds to finance its assets. Even though leverage may intensify profitability and create an opportunity to expand, when employed on too large a scale, it will generate additional risks (Almasri et al., 2025), particularly during financial turbulence or recession.

These two effects make leverage a point of serious concern to the stability of banks due to the distortion in the allocation of deposits and the increase in vulnerability of deposits (Levine et al., 2000). Using leverage in the capital structure involves financial risks, such as insolvency or liquidity crisis. When internal shocks cause the furnace of business to get fired up, the amount of financial obligations of the bank exceeds what could reasonably be expected as far as returns are concerned (Nguyen, 2023). It is due to the intricate relationship between leverage and bank stability that the researchers have concentrated on leverage. They find out that this relationship is not so linear. Moderate amount of debt could boost the performance of banks in terms of financial and asset use.

Nevertheless, at some stage, leverage is risky as it increases the chances of instability because of the high costs of debt service and market shocks that may be more significant than the advantages (Safitri et al., 2023). Pakistani banks have been over-leveraged, with interbank settlements of which, in their turn, led to economic downturns. Although the ideal leverage might be helpful on the one hand in the long run to the banks, debt management plays a significant role in Pakistan, where the economy is unstable, dealing with inflation, interest rates, and currency devaluation. Bad management of leverage and repayment schemes is counterproductive.

Moderate leverage ratios allow banks to diversify risk and operate on a wide range of assets, and diversification will be easier. Such diversification can promote the stability of the business over the long period and decreases the possibility of financial losses. Nevertheless, excessive use of borrowed funds may negatively affect the banking institution in terms of its reaction to the market conditions, since the externalities and inefficiencies are forced to increase in the course of the operations. Higher interest costs become a potential overhead, impacting revenue gains negatively if they undermine stability and reduce profitability (Nguyen, 2023). Increased risk also leads to increased cost of equity (Vengesai, 2025). Even though using debt financing, banks can build upon their business and enhance their profitability, the

macroeconomic factors, e.g. inflation, volatility in exchange rates, etc, the leveraging strategy needs to be implemented cautiously. The leveraging allows the banks to lend to the underserved areas of the developing countries, where people are facing an overall credit deficit, like Pakistan. This enhances the economic recovery and increases social wellness (Abdullah, 2024).

Although leverage can sometimes be a useful step towards achieving profitability and competitiveness, aligning leverage benefits with the human needs of long-term business sustainability is crucial for strategic planning, especially during challenging times. Exogenous shocks may lead banks to increase leverage because of interest rate volatility or currency depreciation, with lenient fiscal policies in Pakistan amplifying the associated financial risks (Acosta-Smith et al., 2024). Linnenluecke et al. (2016) show that troubled banks tend to take bolder measures in desperation, yet they are also willing to enforce control frameworks prematurely when capital is limited, suggesting such banks might negotiate better lending conditions at the expense of equilibrium.

The evidence of leverage and stability of banking institutions shows that leverage may not only carry financial risks but also financial growth. In a way, debt may enhance competitiveness and profitability of a bank such that it will help in attaining strategic objectives (Gardener et al., 2011). Nevertheless, high leverage also comes with its own risks particularly in emerging economies with weak economy and legal structure. Banks operating in Southeast Asia generally maintain relatively high levels of financial leverage (Rana et al., 2025). It is also worth discussing the leverage in Pakistan where its degree is rather important because it is essential to reach the optimal balance of debt and equity that will be stable and sustainable in the context of different challenges. According to Buffer Capital Theory, banks are more vulnerable to financial distress and instability due to their increased debt reliance through excessive financial leverage, which causes the relative amount of capital buffer for the bank to be reduced due to diminished capital cushion. Thus, the bank will have less ability to absorb losses and be exposed to greater risk of financial distress and instability.

H3: Leverage has an effect on bank stability.

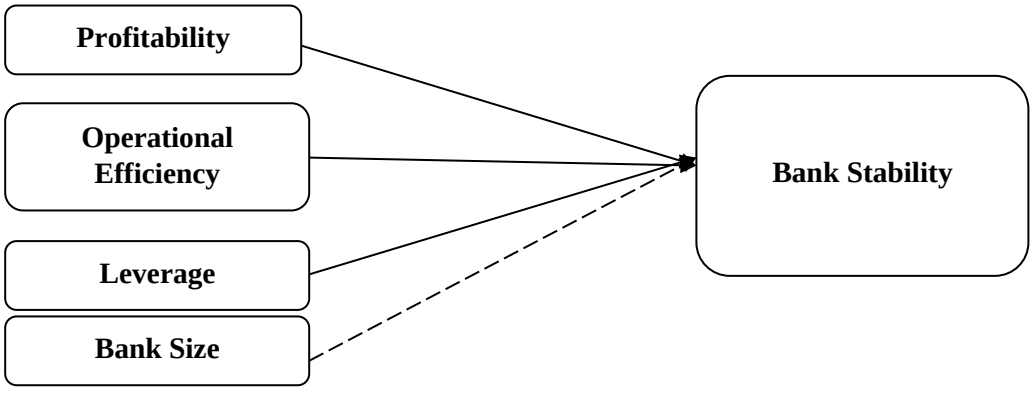

Figure 1: Model of the study

METHODOLOGY

This paper explores the influence of profitability, operational efficiency and leverage on the stability of the banks in Pakistan. All commercial banks listed on the Pakistan Stock Exchange (PSX) from 2019 to 2023 were initially considered. Owing to limited data availability, the final sample included 31

commercial banks, excluding foreign banks that lacked separate financial data for their operations in Pakistan. This research employs panel data. Public databases such as annual reports were utilized as sources of information, which are regarded as high-quality sources in banking studies (Ali & Puah, 2019; Alemayehu & Belete, 2019). In Pakistan, where all commercial banks are discussed, the data is comprehensive, thus reducing the likelihood of potential sample bias. The study encompasses 31 banks, yielding 155 bank-year data points over a five-year period. Measurement of variables is given in Table 1.

Table 1: Measurement of Variables

Variable	Symbol	Measurement
Bank Stability	Z-Score	Measured via Altman's Z-Score
Profitability	NIM	Difference between interest income and interest expenses relative to total assets for bank i at time t
Operating Efficiency	OE	The ratio of a bank's non-interest expenses to its total assets at time t.
Leverage	LR	Total debt as a proportion of total assets for bank i at time t.
Bank Size	Size	The natural logarithm of total assets for bank i at time t.

In line with the study design, econometric equation is given as follows.

$$Z{-}Score = \beta_0 + \beta_1 NIM_{it} + \beta_2 OE_{it} + \beta_3 LR_{it} + \beta_4 Size_{it} + \epsilon_{it}$$

ANALYSIS AND RESULTS

Descriptive Statistics

The higher the Z-score, the more stable the entity and the proximity of a bank is to be detected as bankrupt (Ali & Puah, 2018). The standard deviation value is 8.225, and the average Z-score is 1.45, which means there exists a greater variance between the degrees of stability among the Pakistani banks. Its range of -84.54 and 26.46 shows that there are indeed some institutions that are well settled, stable institutions relative to the other institutions that are highly vulnerable in terms of financial strength. Such a vast deviation correlates with the difficulties which the banking sector in Pakistan had to handle during the period between 2019 and 2023 (Abdullah, 2024; Jamal & Riaz, 2024).

Table 2: Descriptive

Variable	Minimum	Maximum	Standard Deviation	Mean
Z-SCORE	-85.437	25.657	8.225	1.45
Net Interest Margin (NIM)	-1.84	72.25	15.433	7.39
Operating Efficiency (OE)	-3.76	69.27	5.646	2.62
Leverage Ratio (LR)	-27.40	82.22	15.399	10.81
Size	12.470	21.176	2.749	16.509

N = 155

Net Interest Margin (NIM) has a mean of 7.39 and standard deviation of 15.433. This can be viewed as a large variation in the profitability performance of Pakistan banks, where some see impressive margins and others see negative spreads due to macroeconomic challenges and the competitive environment (Mehzabin et al., 2023). Since the positive mean suggests that Pakistani banks have advantages in terms of profitable intermediation activities, the individual performance can change drastically, the same is observed in the work by Mosharrafa (2022)."

Operational efficiency, measured as non-interest expenses relative to total assets, has an average of 2.62, with observed values ranging from -3.76 to 69.27. The comparatively low average indicates that the majority of Pakistani banks have average cost structures, with the substantial dispersion indicating that there is a high level of cost management variation among the institutions. The smaller ratios show that the bank operates more efficiently, which gains even greater significance when the Pakistan bank focuses on digitalization and optimization of processes (Kweh et al., 2022).

The means value of the leverage ratio is 10.81 and standard deviation of 15.399 and the observed values are between -27.40 and 82.22. This kind of differences can be seen as a manifestation of diversity in capital structure policy, with certain banks embracing a conservative leverage policy and some taking a more aggressive approach to debt-funding policy (Acosta-Smith et al., 2024; Safitri et al., 2023; Alemayehu and Belete, 2019).

The average bank size is 16.509, the minimum is 11.57 and the maximum is 21.18 and standard deviation is 2.749. It means that there are large and small commercial banks in the banking system of Pakistan, which is characterized by institutional heterogeneity in terms of the size (Chowdhury et al., 2024; Ferreira, 2023).

Through the Hausman test results, it can be said that the most appropriate type of model is the random effects one since the econometric test has passed with Yensu et al. (2021). Here we have our model is fairly important all round as we see a Wald chi-square of 34.67 ($p < 0.001$) which confirms our claim that by use of our essential variables, they jointly explain the variance of the bank stability.

Correlation

Before running regression models, correlation analysis was conducted to examine pairwise relationships among the variables and to detect potential multicollinearity issues. The results are presented in Table 3.

Table 3: Correlation Matrix

Variables	Z-score	OE	NIM	LR
Z-score	1			
Operating Efficiency	0.2021***	1		
Net Interest Margin	0.0921	0.0251**	1	
Leverage Ratio	0.3353**	0.1692	0.0931*	1

Note: *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively (i.e., $p < 0.10$, $p < 0.05$, $p < 0.01$).

The correlation results indicate that Z-score (bank stability) has a positive relationship with both operational efficiency ($r = 0.2021$) and leverage ratio ($r = 0.3353$), while its correlation with net interest margin is insignificant. In addition, operating efficiency and leverage show an insignificant correlation with each other ($r = 0.1692$). These results give initial evidence that the leverage as well as efficiency can be significant factors in the explanation of the bank stability, and profitability (NIM) is not significantly related to the bank stability in the Pakistani context.

Notably, all the correlation coefficients are not very high indicating that there is no issue of multicollinearity in the present research. This makes it possible to include the explanatory variables in the regression model without affecting the accuracy of the estimates.

Testing of Hypothesis

To identify the most appropriate regression model whether fixed or random effect the Hausman test was applied. Findings from the test suggested that there was insufficient evidence to reject the null hypothesis ($\chi^2(4) = 0.65$, $p > 0.9578$), indicating that the random effects model is appropriate for the estimation in this study. This approach aligns with the methodology adopted in previous research on banking stability (Shahriar et al., 2022).

Table 4: Estimations with Panel Data

	(1)	(2)	(3)	(4)
NIM	0.029 (0.041)	0.029 (0.041)	0.029 (0.041)	0.029 (0.041)
OE		0.246** (0.109)	0.246** (0.109)	0.246** (0.109)
LR			0.148*** (0.040)	0.148*** (0.040)
Size				0.702*** (0.231)
Constant	-11.959*** (3.657)	-10.253*** (3.404)	-10.006*** (3.324)	-9.944*** (3.225)
R^2	0.192	0.210	0.225	0.244
ΔR^2		0.018	0.015	0.019
Prob > χ^2	0.000	0.000	0.000	0.000

Note: The standard errors are given with significant values of $p < 0.01$, $p < 0.05$, and $p < 0.1$.

The insignificant coefficient of profitability indicates profitability doesn't ensure bank's stability in Pakistan. Therefore, our hypothesis (H1) that profitability has a positive impact on the stability of the bank is rejected. This finding implies that traditional profitability measures alone cannot adequately explain financial stability in the Pakistani banking sector, particularly in light of the volatile economic environment during 2019–2023 (Mehzabin et al., 2023; Mosharrafa, 2022). This indicate the presence of a complex business environment in Pakistan, characterized by macroeconomic fluctuations, regulatory risks, and intense competition, which together obscure the true relationship between profitability and stability (Abdullah, 2024; Mehzabin, 2023). Results also showed that OE (operating efficiency) which is represented by the ratio of Non-interest expenses to total assets (TA) has a significant positive influence on bank stability (Z-score). This result is a copy of the X-efficiency hypothesis which emphasizes the need to manage costs efficiently to ensure financial resilience (Berger & Humphrey, 1997). Accordingly, our second hypothesis (H2) is supported by the data. These findings also align with the arguments of Abbas and Hassouni (2024), who highlight operational efficiency as a central factor influencing stability in emerging banking markets.

The leverage ratio has also been found to be posing a positive effect on bank's stability. Finding supports our hypothesis (H3). The positive coefficient is enlightening in that the banks in Pakistan use debt financing to enhance the stability of the bank without putting it in jeopardy and significantly affect leverage levels on optimum levels as it illustrates in the Trade-off Theory of capital structure (Myers, 1984; Frank & Goyal, 2008).

As stressed by Safitri et al. (2023), the Pakistani-controlled banks can perform the leveraging successfully enough in order to reach the high levels of asset utilization and diversify the funding and thus limit the level of assumed risk. In addition, there exist a strong positive effect of the size of the banks and the stability of the bank. It is consistent with Ferreira (2023). This immense implication reveals that the larger banks in Pakistan are less vulnerable exposed to risk presumably because of the economies of scale, advantages of diversification, greater risk management capabilities and are not more inclined to access the capital market (Shahriar et al., 2023).

Discussion

This study focused on the determinants of bank stability in Pakistan through an analysis of the contribution of profitability, operational efficiency, leverage and bank size. This analysis is done using panel data of 31 commercial banks from 2019 to 2023, where the stability of a bank was assessed in terms of the Z-score. Regression analysis findings showed that a positive and statistically significant impact of operating efficiency on the stability of the bank exists. This supports the hypothesis on X- efficiency (Berger & Humphrey, 1997) which holds that the more cost-efficient banks are, the more they are able to withstand shock. The same outcome is supported by and Abbas and Hassouni (2024), who emphasize efficiency as a key element of ensuring the stability in the banking systems that are evolving.

Results further revealed that the debt financing by Pakistani banks is done in a manner that enhances their stability as opposed to undermining it. This observation aligns with the theory of capital structure that creates a tradeoff between tax advantages of debt and risk of being in financial distress by moderate leverage (Frank & Goyal, 2008; Myers, 1984). The conclusion also corresponds to Safitri et al. (2023), who stated that Pakistani banks are effective in leveraging to enhance their asset utilization, diversify their funding and mitigate exposure to risks. Another important determinant of stability was the bank size where, the larger the bank the higher the score of the Z-score. Bigger institutions are more stable because they can diversify risks, can gain access to cheaper funding; invest in technology, and compliance infrastructure (Ferreira, 2023; Shahriar et al., 2023). The result also describes the consolidation tendency in Pakistani banking industry where bigger banks have their merits that can make them less prone to shocks as compared to the small banks.Results also found that the role of profitability is not decisive in the case of stability in the Pakistani situation. The insignificant effect of profitability can be attributed in Pakistan to the fluctuating macro-environment, regulatory issues, and high competition in the country, as the profitability cannot be converted into long-term stability (Abdullah, 2024; Mehzabin, 2023).

The research paper has filled a significant gap in literature because it concentrated on the factors that can determine the stability of banks in Pakistan, which has been given less coverage than the developed markets and even other developing economies. The past literature tended to focus on profitability as the most important factor of stability, however, this study indicates that efficiency, leverage, and size feature in the Pakistani environment are more important

CONCLUSION

To summarize, this study highlighted the effects of profitability, leverage, and operational efficiency on stability among banks operating in Pakistan. The study revealed that leverage and operational efficiency positively contribute to a bank's ability to be stable or maintain long-term viability, which implies that banks that have adequate amounts of capital as well as exhibit high levels of operational efficiency have a greater chance of being able to absorb shocks while remaining viable over time. Conversely, results indicated that profitability does not have significant impact bank stability, implying that focusing solely on a bank's profitability will not provide any assurance of the bank's financial stability. Therefore, this study has identified the importance of sound capital management as well as operational efficiency when attempting to strengthen a bank's ability to endure over time.

Implications of the study

The results make the application of some of the most important theories applicable in the Pakistani banking industry. The X-efficiency hypothesis is validated by the fact that operating efficiency plays significant role in bringing about stability. The theory of economies of scale is also upheld because larger

banks are discovered to be stable because of their sizes. There are also significant practical implications as well as policy implications of the results. To the bank managers, the findings are important in that they point out the necessity of enhancing efficiency and optimal leverage levels in order to attain stability. The managers need to emphasize on controlling costs, diversification of sources of funds and adequate risk management. To policy makers and regulators, the findings indicate that stability can be enhanced through promotion of consolidation and expansion of banks so that they can enjoy the economies of scale. Further on, because profitability is too small to bring stability, the regulators must not base their assessments of the health of banks solely on profitability but also efficiency and leverage.

Future Research Directions

Despite the fact that this study can offer a very useful insight, some ways in which future research can further its analysis can also be proposed. First, the Z-score could be employed with other indicators of stability, including non-performing loans, capital adequacy ratios, or composite indicators, in order to reflect various aspects of stability. Second, a time horizon should extend not only to the crisis but also to the non-crisis time to determine the cyclones of bank stability. Third, the inclusion of macroeconomic variables like inflation, exchange rate volatility and governance indicators would give the more holistic perspective of external forces. Fourth, a broader analysis of the situation in Pakistan to incorporate regional or cross-country comparisons may show the structural difference among the banking systems. Finally, advanced econometric techniques, e.g. non-linear modeling, threshold analysis, or machine learning methods could help to identify latent trends and provide a more insightful view as to the factors that shape bank stability in emerging markets.

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