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Bank Diversification and Performance Nexus: Theoretical and Empirical Insights from South Asia

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Abstract: The aims of the study include examining the relationship between assets, funding, income diversity, and bank performance using a panel dataset over the period ranging from 2011 to 2023 by applying a two-step system GMM procedure for South Asian banks. The findings reveal that diversity in funding sources and assets leads to decreases in the profitability of banks in South Asia. The findings imply that overdoing it in funding and asset diversity is not good for South Asian banks. However, the diversity in income sources causes the performance of South Asian banks to boost up. Implying that an increase in income sources causes an increase in the profits of South Asian banks. Moreover, the empirical analysis remains consistent for the outcome of well- and under-capitalized banks. The findings are also in line with the economics and finance theories, including portfolio diversification, resource-based theory, and agency hypothesis. The findings suggest that regulators, economists, policymakers, and managers should revise the composition of their banks' assets and funding sources to optimize benefits in South Asian regions.

Key words: GMM, Banks, South Asia.

JEL Code: G21, G28, G32, L25.

1. Introduction

The role of financial institutions is consistently vital in the advancement, growth, and development of both developed and emerging economies throughout human existence. Since the 2007-2008 financial crisis, financial institutions remain dedicated to identifying strategies to safeguard themselves from analogous circumstances in the future, ensuring sustainable survival and expansion (Abbas, Rubbaniy, Ali, & Khan, 2024). Furthermore, the current development of rapid globalization of financial institutions has opened new debate about the complexities of the global financial system. In addition, technological advancement, the advent of financial technology, and financial industry reforms have changed the landscape of financial institutions across the globe (Kaur & Bansal, 2024). These developments in the financial world led to increased competition, decreased interest margins, and forced financial institutions to find out ways to maintain their performance with stability both in developed and emerging economies.

Therefore, the association between bank diversification policies and financial performance has garnered significant interest in recent years, especially in light of the shifting regulatory environment and developing financial markets. In the last two decades, several studies have been conducted to explore the various aspects of bank diversification to mitigate the riskiness of depository institutions without reducing profitability. For instance, recent studies include Ben Lahouel, Taleb, Ben Zaied, & Managi, (2024) uncovering the impact of income diversification on bank liquidity holding and liquidity creation in the European banking sector; Shabir et al., (2024) investigating the diversification and stability in the MENA banking industry under the presence of climate and pollical risk; Tang, Hu, Corbet, Hou, & Oxley, (2024) exploring fintech and diversification in China; and Schreiber (2024) conducting a study by using US bank data. In addition, most other studies remain restricted to investigating the impact of income/revenue diversification on the risk and performance of banks in developed economies (Abbas et al., 2024; Alouane, Kahloul, & Grira, 2022; Gafrej & Boujelbéne, 2022; Kaur & Bansal, 2024; Schreiber, 2024).

Despite the longstanding discourse on diversification in corporate finance literature, it remains inadequately explored in an empirical setting concerning financial institutions and banks (Hayden, Porath, & Westernhagen, 2007). Therefore, there are very few studies which explore the impact of asset, income, and funding diversification on bank performance in developing economies, especially in South Asia, for the current decade. Furthermore, the majority of studies continue to be limited in their ability to articulate the significance of empirical results

within their supporting theoretical frameworks. Therefore, the objective of this study is to investigate the impact of asset, income, and funding diversification on the performance of South Asian commercial banks; and to highlight the relevant supportive theories. To fill this gap in our investigation, answer the following questions: What is the relationship between bank diversification and performance? Do bank capitalization and economic conditions affect both diversification and bank performance?

Our study is not comparable with the existing ones due to the following aspects. Our study emphasizes the significance of pertinent theories in establishing a robust foundation within the banking diversification literature for enhanced comprehension, a characteristic often absents in previous research. Second, this study covers the broader definition of non-interest income, which contains credit-related charges, corporate finance fees, underwriting fees, guarantee rewards, clearing and settlement margins, portfolio and other management fees, securities activity fees, trust fees, and other fiduciary fees. The ongoing process of financial liberalization and deregulation in South Asian emerging economies has led to the emergence of private financial institutions and rapid growth in their capital markets. Consequently, banks in these economies no longer rely solely on their traditional source of interest income but also generate noninterest income to ensure their financial stability and survival. Therefore, we include maximum sources of non-interest income to better capture the underlying performance of commercial banks. Third, this study considers the full range of assets and funding sources when calculating proxies for asset and funding diversification. Additionally, since loans are the primary source of revenue in banking, we developed a proxy for loan diversification to gain a deeper understanding of their impact on bank performance. Therefore, for the robustness check of asset diversification, we used loans diversification, which includes mortgage loans, consumer loans, corporate loans and other loans reported in the financial statements. This proxy test is a new addition to the literature on bank diversification, particularly for commercial banks in South Asia from 2011 to 2023. The center of the cure ideology of financial regulations is the liability side of the balance sheet (Abbas et al., 2024). Although liability side contains funding sources which are directly connected with the composition of an organization's assets side. Therefore, the financial performance and stability of firms are influenced by the arrangement of financing and the composition of assets.

Our study contributes to the existing literature of banking diversification in general, and especially in the context of South Asian financial markets. First, our study highlights the critical role of theoretical frameworks in advancing the banking diversification literature, addressing gaps in understanding diversifica-

tion strategies and their impact on organizational performance. By linking economic and financial theories such as agency theory, portfolio theory, and a resource-based view to asset, income, and funding diversification, we offer a structured foundation for future research. This contribution is particularly unique in the context of banking, providing a comprehensive theoretical perspective that has been largely absent in existing studies. Secondly, it is the first study that is simultaneously highlighting the impact of revenues, assets, and funding diversification on the financial performance of large commercial banks in South Asia for the period ranging from 2011 to 2023, which is lacking in the existing literature. Thirdly, this study incorporates various financial performance indicators such as return on average assets, return on average equity, and net interest margin, which are not included in the existing literature, especially when discussing asset and funding diversification within the context of South Asia. Fourthly, this study contributes to the existing literature by examining commercial banks based on their capitalization, a topic often overlooked when discussing the impact of diversification on bank performance in South Asia. Finally, this research contributes to the banking literature by highlighting the crucial role of economic conditions in influencing the performance and diversification of banks within the South Asian context.

The findings have theoretical and practical implications for regulators, economists, and mangers; for example, the impact of asset composition is not good in South Asian banks, which should be readjusted to increase their efficiency. There is a need to increase the share of such types of loans, which provide higher returns and also increase the interest collection criteria to avoid non-performing loans. Moreover, there is a need to replace assets which are not providing market-based returns. The next section highlights the relevant literature and formulation of hypotheses, and the third part provides data and techniques used to predict parameters. The fourth section contains the results and discussion, and the last section has concluding remarks and policy recommendations.

2. Hypotheses development

Diversification and risk-taking always remain an essential debate among investors, economists, and policymakers. The idea centers on the concepts of "portfolio theory" and the adage "don't put all your eggs in one basket." The concept of diversification and specialization in lending has been discussed by Markowitz (1952) and Winton (1999). Demsetz & Strahan, (1997) explore US industry to reach the conclusion that loans and diversification have a close connection. They also support the view that larger banks exploit the market due to their

dominance. However, Acharya, Hasan, & Saunders (2006) and Winton (1999) find a strong relationship. Hayden et al. (2007) conclude a poor relationship between diversification and bank performance in Germany using data from 1996-2002. Fang, Hasan, & Marton (2011) provide an inverse relationship between loan and bank performance. Rossi, Schwaiger, & Winkler, (2009) investigate the impact of diversification on the profit of banks and conclude that diversification positively impacts profitability and, at the same time, it also increases the cost of the organization. Vidyarthi (2020) explored the impact of income diversity on the performance of Indian banks by using Tobit regression and found a U-shaped connection. Moudud-Ul-Huq (2019) concluded that the role of diversification is weaker in ASEAN nations in comparison with the banks of BRICS economies while studying the relationship between bank diversification and profitability. Lestari, Ma, & Jun (2023) examined the role of income diversity on the stability of banks and found a weak correlation between revenue and stability of banks. Hemrit, Kasraoui, & Feidi (2024) document the findings regarding diversification and bank performance. The findings of their study support the hypothesis that diversification is beneficial for reducing risk and improving profit. Sanya & Wolfe, (2011) predict that income diversity increases the performance of banks. Abbas et al., (2024) investigate the relationship between diversification and bank performance. The findings of their study conclude that diversity on the asset side of the banks is beneficial for improving the profitability of commercial banks in the US. In the light of mixed results, the following hypotheses are developed.

Hypothesis 1: Similar to other factors, the performance of commercial banks in South Asia is significantly impacted by asset, funding, and income diversification.

Hypothesis 2: Similar to other factors, the economic conditions significantly influence the relationship between asset, funding, and income diversification and the performance of commercial banks in South Asia.

2.1. Bank Capitalization and Size

Shabir et al. (2024) examine the connection between political and climate risk and income diversity of MENA banks. They build an argument that the size and market conditions play a vital role in the relationship of diversity and different types of risk. Alouane et al. (2022) used data for 22 years (2000–2022) from Japanese banks to examine the impact of assets and income diversification. The findings suggest that while income diversification contributes to risk mitigation in

Japanese banks, non-banking operations fail to generate higher returns on assets. Rossi et al., (2009) discussed in their research that bank capitalization and diversification of banks have a significant relationship to impact each other in Australia. They also highlight that banks with different capitalization have different results for the said connection. Vidyarthi (2020) examined the role of bank size and income diversity using the data for private and public sector banks. He concludes that size is a significant factor in intervening in the relationship between income diversification and banks' performance for both public and private ownerships. Khan (2022) investigates the performance of banks in GCC economies and concludes that bank size, asset management, and capital ratio are key factors impacting this performance. Mohammad & Khan (2024) examined the effect of liquid assets on the profitability of banks in South Asia for the period from 2016 to 2021. The study concludes that the impact of liquidity varies for different types of banks in South Asian economies. Sanya & Wolfe, (2011) highlight that banks are required to diversify their assets, income, and funding for long-run businesses. They argue that an increase in core business with non-interest profits is key to boosting up the profits in current situations. Abbas et al. (2024) studied commercial banks and concluded that asset diversification improves the profits; however, the role of funding depends upon the cost of it to impact the profits. In the case of income diversity, it always remains beneficial to increase the performance of banks and reduce risk as well. Abbas & Ali, (2022) explore different attributes of commercial banks to judge the relationship between income and balance sheet diversifications; for example, they test the impact for well-capitalized and undercapitalized banks and high and low liquid banks in the US and conclude there is a significant impact on the relationship. Therefore, the following hypothesis is developed to test.

Hypothesis 3: The performance of commercial banks in South Asia is influenced by asset, funding, and income diversification, which varies depending on the level of capitalization, either well- or undercapitalized.

3. Methodology

3.1. Data

The focus of the study is South Asian banks, which include India, Sri Lanka, Bangladesh, Pakistan, and Nepal, and the time span is 2011 to 2023. The South Asian countries have many banks, but we chose those that are listed at Bankscope/BankFocus. Out of all the listed commercial banks, we have chosen 570 based on the following criteria: a bank should be listed on BankScope and should not have losses for the last two consecutive years; banks must have $300 million or more in assets on their balance sheet.

3.2. Econometric Model

The Generalized Method of Moments (GMM) is a powerful and robust econometric tool, especially well-suited for panel data analysis, which makes it an excellent fit for investigating the interplay between banks' diversification strategies and their performance. GMM excels at incorporating lagged dependent variables into the model while effectively addressing endogeneity through the use of instrumental variables. Additionally, it controls for unobserved heterogeneity across individual units in panel datasets. The GMM regression is structured in a panel framework for bank i at time t, with the core model specification as follows:

$$\boldsymbol{Performance}_{i,t} = \boldsymbol{\alpha} + \boldsymbol{\beta}_0\boldsymbol{Performance}_{i,t-1} + \boldsymbol{\beta}_1\boldsymbol{Diversification}_{i,t} + \boldsymbol{\phi}_1\boldsymbol{Controls}_{i,t} + \boldsymbol{u}_{\mathrm{i}} + \boldsymbol{\varepsilon}_{i,t}$$

$Performance_{i,t}$ represent ROAA, ROEE, and NIM in line with Doğan & Yildiz, (2023); $Performance_{i,t-1}$ indicate the lagged performance; $Diversification_{i,t}$ here we mean the diversity in bank assets, bank income streams, and bank financing; $Controls_{i,t}$ these proxies are used based on the past studies for both bank-related factors and economic factors; u_{i} it is showing the bank-specific effects; and $\varepsilon_{i,t}$ this shows the error term. The model specification is in line with the studies by Abbas & Ali (2022) and Doğan & Yildiz (2023). Table 1 provides a comprehensive list of variables.

Table 1: Variables descriptions and nations

Variables	Descriptions
Dependent variables	
NIM	Interest income less interest expense to total earnings assets (Abbas et al., 2024)
ROAE	Net income to total average shareholder equity (Edirisuriya et al., 2015)
ROAA	Net income to total average assets (Lee et al., 2014)
Independent variables	
Asset Diversification	1-(Customer loans/earning assets)^2+ (Interbank loans /earning assets)^2+ (Securities/earning assets)^2+ Other assets/earning assets)^2 (Abbas & Ali, 2022)
Funding Diversification	1-(Equity/total funding)^2+(Sub-ordinate debt/total funding)^2+(Deposits/total funding)^2+(Short-term funds/total funding)^2 (Nguyen, 2018)
Income Diversification	1-((Interest income/total income)^2 +(non-interest income/total income)^2 (Kaur & Bansal, 2024)
Loans Diversification	1-(mortgage loans/total loans)^2 +(corporate loans/total loans)^2 + (consumers loans/total loans)^2 + other loans/total loans)^2 (Hayden et al., 2007)
Control variables	
Capital ratio	Total equity to total assets (Abbas & Younas, 2021)
Liquidity ratio	Liquid assets to total assets (Thakur & Arora, 2024)
Risk	Non-performing loans/total loans (Sharma & Anand, 2018)
Size	Natural log of total assets (Acharya et al., 2006)
Loans ratio	Sum of total loans to total assets (Toh et al., 2020)
Operating efficiency	Non-interest expenses to total assets ratio (Thakur & Arora, 2024)
Inflation rate	It represents the yearly consumer price index (Abbas et al., 2024)
Economic growth	Year-wise GDP growth rate (Abbas et al., 2021)

4. Results and Discussion

4.1. Descriptive statistics

Table 2 shows the South Asian financial organizations' statistics, with a mean ROAE of 5.42% with low variability of 1.53% but moderate left-skewness (-0.64), indicating stable profitability marred by a subset of firms with significantly lower returns. Meanwhile, NIM averages 1.9% with minimal dispersion 0.013 and near-symmetry, reflecting resilient core earnings. Asset diversification is high, with a mean of 0.803, while loan diversification is even stronger, with a mean of 0.939. Liquidity shows a moderate average of 0.289 but a high standard deviation of 0.774, and the NPL ratio remains low at 5.4%, supporting robust credit quality. Macroeconomic conditions are volatile, with inflation averaging 2.14% and GDP growth 1.93%, introducing external pressures that may influence profitability and risk profiles in hypothesis testing.

Table 2: Descriptive Summary

	Mean	SD	Kurtosis	p5	p25	p75	p90
NIM	.019	.013	3.213	.008	.012	.021	.034
ROAE	5.42	1.527	1.022	-3.71	2.57	8.96	15.55
ROAA	.005	.011	2.952	-.004	.001	.007	.014
Asset Diversification	.803	.158	2.316	.499	.689	.934	.957
Loans Diversification	.939	.156	2.897	.508	1	1	1
Funding Diversification	.804	.122	1.054	.536	.753	.888	.913
Income Diversification	.095	.461	1.155	-.434	-.022	.312	.54
Capital ratio	0.232	1.002	2.891	0.429	0.159	0.473	0.209
Liquidity ratio	.289	.774	1.952	.041	.097	.305	.466
NPL ratio	.054	.076	1.158	.007	.02	.062	.1
Log TA	16.845	2.814	1.177	13.461	14.926	17.701	22.896
Loans ratio	.566	.138	2.053	.343	.472	.664	.725
Operating efficiency	.016	.015	2.902	.007	.01	.016	.025
Inflation rate	2.141	3.587	3.53	-.728	-.025	2.796	7.418
Economic growth	1.93	3.544	2.128	-4.823	.296	4.098	6.805

Source: Authors' development by using STATA

4.2. Correlation matrix

Table 3 represents a correlation analysis, revealing key interrelationships among financial and macroeconomic variables in South Asian financial institutions. NIM is positively correlated with profitability, showing moderate associations with ROAE and ROAA, confirming its role in driving performance, yet it is negatively linked with funding diversification, suggesting that broader funding sources may compress margins. Income diversification emerges as a strong profitability driver, with robust positive correlations to ROAE and ROAA, while loan diversification and asset diversification show weak negative correlations with profitability, hinting at potential trade-offs between risk spreading and return generation. The NPL ratio negatively impacts ROAE, underscoring the adverse effect of credit risk on earnings. Finally, both inflation rate and economic growth are positively correlated with profitability, indicating that firms perform better during periods of economic expansion and moderate inflation, highlighting the favourable influence of macroeconomic tailwinds.

Table 3: Pairwise correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
NIM	1.000														
ROAE	0.211*	1.000													
ROAA	0.322*	0.106*	1.000												
Asset Diversification	-0.001*	-0.122*	-0.002*	1.000											
Loans Diversification	-0.130*	-0.258*	-0.113*	0.016*	1.000										
Funding Diversification	-0.215*	-0.347*	-0.246*	0.419*	0.321*	1.000									
Income Diversification	-0.023*	0.537*	0.426*	-0.296*	-0.052*	-0.265*	1.000								
Capital ratio	-0.101*	-0.001	-0.047*	-0.319*	0.104	-0.026*	0.080*	1.000							
Liquidity ratio	0.103*	0.006*	0.081*	0.024	-0.006	-0.249*	-0.061*	0.005*	1.000						
NPL ratio	0.201*	-0.259*	-0.274*	0.022*	0.009	-0.089*	-0.288*	-0.095*	0.333*	1.000					
Log TA	-0.108*	0.213*	0.028*	-0.200*	-0.022*	-0.079*	0.255*	0.139*	-0.041*	-0.011*	1.000				
Loans ratio	0.021*	0.101	0.033	0.003	-0.048*	-0.099*	-0.044*	-0.079*	-0.132*	-0.009	0.003*	1.000			
Operating efficiency	0.044*	0.009*	0.268*	-0.050*	-0.201*	-0.123*	0.026*	-0.078*	0.041*	0.011*	-0.221*	0.002*	1.000		
Inflation rate	0.011*	0.376*	0.087*	-0.018*	-0.233	-0.672*	0.039*	-0.075*	0.001*	0.012*	-0.022*	0.032*	0.101*	1.000	
Economic growth	0.041*	0.488*	0.225*	-0.088*	-0.112*	-0.432*	0.221*	-0.014*	0.016*	-0.031	0.021*	0.053*	0.188*	0.201*	1.000

Source: Authors' development using STATA significance *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

4.3. Full sample results

Table 4 documents the empirical results for South Asian banks; the findings highlight that the past performance of these banks is influencing their current profitability, implying that banks use their retained earnings to reinvest in new opportunities, which leads to boosting their profits. The findings indicate that asset diversification and profitability are negatively correlated, suggesting that banks are not investing in projects that would increase their profits; instead, bank managers may choose to lend to projects that yield lower returns or to those whose costs exceed their earnings, which aligns with agency theory and resource based view (Barney, 1991; Jensen & Meckling, 2019). The results confirm that excessive use of funding is not advantageous for South Asian banks to boost up profits, as suggested by the negative relationship in empirical testing. There may be two reasons for the adverse connections: first, the banks are taking funding at above the return rate; second, the banks are not utilizing it at an optimal level to achieve higher profits. The negative relationship between funding diversification and bank profitability is consistent with the pecking order theory (Myers, 1984), which suggests that banks are required to use internal funds instead of raising money from external sources, which may increase their complexity in controlling costs and boosting profits. It is also important to note that reliance on excessive external funding may affect the financial signals of the organization, potentially influencing investors' decisions to invest in favour of the organization; this aligns with the information asymmetry theory (Ross, 1977).

The third diversification proxy is income diversification. The empirical analysis reveals that income diversification and profitability have a positive relationship. The findings imply that diversity in revenue sources causes a decrease in risk and an increase in profitability, which is in line with Markowitz (1952). It has an explanation that a bank may enter a new market to capture new business and/or it may launch a new product to capture a fresh market to capitalize on maximum benefits.

The view is also in line with the resource dependence hypothesis, which states that banks that depend on limited sources of revenue face difficulties in comparison with those that have diverse sources of revenue. Pfeffer & Salancik (2015) argue that diversifying revenue sources enhances resilience and increases profits. The coefficient of control variables has significant interpretations and require attention to understand the connection with bank profitability, particularly in the context of the South Asian region.

The empirical results highlight the negative relationship between bank profitability and capital ratio, which encourages using internally available funds instead of issuing new shares in the market. The preference for internal funds instead of external sources supports the hypothesis of the pecking order theory (Myers, 1984). We may argue in contrast to the pecking order theory to support the view of the alternative hypothesis of capital buffer assumptions, which expresses that the regulatory demand to hold higher equity capital against the risk-weighted assets may impact bank profits in negative manners. The higher holding of capital remains unused; therefore, it earns no profit for that holding part of the capital, which leads to a decrease in the profitability rate against total assets. The impact of NPL is also negative on the performance of banks in South Asia, which means the banks' lending is not up to the mark for borrowers and, therefore, the ratio of non-performing loans is higher, which ultimately impacts the profits against the assets of the banks. In support of the credit risk theory, a higher ratio of NPL requires higher provisions, which cuts the profits, which is in line with Berger & DeYoung (1997). The size is also affecting the performance of banks; for instance, larger banks may use their position to exploit the market in their favour in comparison with smaller banks. Therefore, the inverse relationship between profit and bank size as measured with the natural log of assets is consistent with economies of scale (Schmalensee, 1989). Banks' expenses reflect their operating efficiency, which supports the cost and leadership hypothesis (Porter & Strategy, 1980) This implies that investing in expert employees helps banks improve performance and reduce costs associated with low profits.

The empirical analysis is also conducted for alternative measures of bank performance for the return on average equity to predict the real situation for shareholders. Table 5 contains the empirical evidence for the impact of diversification on bank performance as measured with return on average equity. The lagged return on equity is persistent, as it was in return on assets, which confirms that past profits remain beneficial for shareholders to increase their wealth, which is the key objective of financial management in finance (Carhart, Kaniel, Musto, & Reed, 2002). However, diversity in assets, funding, and income sources has heterogenous results to impact the wealth of equity holders in South Asian banks. The negative impact of diversification in funding sources indicates that bank managers are taking funding at a higher rate than the expectation of equity holders (Myers, 1984). Asset diversification negatively impacts equity holders by decreasing their returns. The argument is in line with the risk-return trade-off theory (Markowitz, 1952). However, diversification in income sources favours equity holders, and it is a positive contribution to shareholder profits (Bain, 1951).

Table 4: Diversification and Return on Average Assets

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	ROAA	ROAA	ROAA	ROAA	ROAA	ROAA
L.ROAA	0.380***	0.398***	0.360***	0.307***	0.323***	0.095**
	(0.099)	(0.096)	(0.081)	(0.110)	(0.108)	(0.231)
Asset Diversification	-0.005***			-0.004**		
	(0.002)			(0.001)		
Funding Diversification		-0.014***			-0.015***	
		(0.003)			(0.003)	
Income Diversification			0.006***			0.040***
			(0.001)			(0.014)
Inflation rate				0.003***	0.002**	0.001***
				(0.000)	(0.000)	(0.000)
Economic growth				0.002***	0.009***	0.001***
				(0.000)	(0.000)	(0.000)
Constant	0.010***	0.018***	0.004**	0.010***	0.020***	0.018**
	(0.003)	(0.004)	(0.002)	(0.003)	(0.004)	(0.007)
Observations	3,577	3,577	3,570	3,577	3,577	3,570
AR(2)	0.309	0.278	0.565	0.391	0.356	0.489
Sargan	0.251	0.650	0.138	0.621	0.602	0.455

The GMM estimation results for South Asian banks (2011–2023) use ROAA as the dependent variable and asset, funding, and income diversification (measured as sum of squares to capture nonlinearity) as key independents, with consistent control variables across models. Sargan tests assess overidentification, AR (2) checks serial correlation, and heteroskedasticity-robust standard errors are in parentheses; significance is denoted as ***p<0.01, **p<0.05, *p<0.1.

Table 5: Diversification and Return on Average Equity

	(1)	(2)	(3)	(1)	(2)	(3)
VARIABLES	ROAE	ROAE	ROAE	ROAE	ROAE	ROAE
L.ROAE	0.485***	0.406***	0.538***	0.403***	0.457***	0.432***
	(0.085)	(0.095)	(0.085)	(0.092)	(0.087)	(0.108)
Asset Diversification	-0.436***			-0.261*		
	(0.657)			(0.511)		
Funding Diversification		-0.535**			-0.220	
		(0.195)			01.861)	
Income Diversification			0.821***			0.864***
			(0.128)			(1.144)
Inflation rate				0.212**	0.173**	0.301***
				(0.086)	(0.080)	(0.058)
Economic growth				0.315***	0.317***	0.337**
				(0.108)	(0.111)	(0.138)
Constant	0.644**	0.749**	0.958**	0.072**	0.829	0.104***
	(0.655)	(0.313)	(0.199)	(0.726)	(0.813)	(0.158)
Observations	3,525	3,525	3,518	3,525	3,525	3,518
AR(2)	0.560	0.668	0.577	0.703	0.616	0.872
Sargan	0.605	0.205	0.236	0.120	0.238	0.713

The GMM estimation results for South Asian banks (2011–2023) use ROAE as the dependent variable and asset, funding, and income diversification (measured as sum of squares to capture nonlinearity) as key independents, with consistent control variables across models. Sargan tests assess overidentification, AR(2) check serial correlation, and heteroskedasticity-robust standard errors are in parentheses; significance is denoted as ***p<0.01, **p<0.05, *p<0.1.

4.4. Capitalization based results

This section represents the empirical findings based on the capitalization of banks. In addition to it, a similar approach is used to predict parameters for the impact of diversification on the performance of well-capitalized and under-capitalized banks in South Asia. Table 6 indicates that the past profitability of well-capitalized banks is contributing to the current profits, which is also supporting the results of the full sample measure with profit on assets and equity (Teece, Pisano, & Shuen, 1997). Theoretically, the past performance positive impact on current profits is in line with the dynamic capability hypothesis (Teece et al., 1997). In a study of the impact of asset diversification on the performance of well-capitalized banks, the relationship is significant and negative, which means although the diversity in assets is better for risk reduction, in the case of inefficient use, it is not good, which may be the case here in the form of a negative relationship between asset diversity and well-capitalized banks' performance (Markowitz, 1952). The negative relationship between asset diversification and profitability is also found for undercapitalized banks as well (Barney, 1991). The impact of income diversification to influence the returns of well-capitalized and under-capitalized banks is positive and significant. The relationship between profitability and funding diversification for well-capitalized and under-capitalized banks is also negative, which posits that an excessive use of external funding increases the cost of banks in higher proportion than their returns (Jensen & Meckling, 2019). However, the positive impact of income diversification on profitability for both well-capitalized and under-capitalized banks suggests that banks should increase their income sources other than their interest income, which will be favourable for their longer survival and stability (Meslier, Tacneng, & Tarazi, 2014). The adverse relationship between funding and asset diversification in both well- and under-capitalized banks underscores the importance of managing these for optimal usage (Demirgüç-Kunt & Huizinga, 2010).

In a similar way to the full sample, we have tested the returns on average equity and diversification in well- and undercapitalized banks as well. Table 7 provides empirical outcomes for both well- and under-capitalized banks using ROAE. Here, again in line with the results of the full sample, the impact of income diversification on profitability of well- and under-capitalized is positive. However, the impact of assets and funding diversification is negative, which is also in line with the full sample results (Myers, 1984). The results suggest that profitability (ROAE) in banks is influenced by a combination of diversification strategies, financial ratios, and macroeconomic conditions.

Table 6: Diversification, Return on Average Assets and Economic conditions in well-and under-capitalized banks

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	ROAA	ROAA	ROAA	ROAA	ROAA	ROAA
L.ROAA	0.128*	0.128*	0.248**	0.189**	0.210**	0.096
	(0.066)	(0.068)	(0.110)	(0.094)	(0.087)	(0.087)
Asset Diversification	-0.007**			-0.004**		
	(0.003)			(0.002)		
Funding Diversification		-0.013***			-0.022***	
		(0.004)			(0.005)	
Income Diversification			0.032**			0.007***
			(0.016)			(0.002)
Observations	995	995	990	1,330	1,330	1,329
AR (2)	0.178	0.157	0.304	0.913	0.948	0.529
Sargan	0.171	0.165	0.348	0.156	0.475	0.547

The GMM estimation results for South Asian banks (2011–2023) use ROAE as the dependent variable and asset, funding, and income diversification (measured as sum of squares to capture nonlinearity) as key independents, with consistent control variables across models. Hansen/Sargan tests assess overidentification, AR (2) checks serial correlation, heteroskedasticity-robust standard errors are in parentheses; significance is denoted as ***p<0.01, **p<0.05, *p<0.1.

Table 7: Diversification, Return on Average Equity and Economic conditions Well and Under-capitalized banks

	(1)	(2)	(3)	(1)	(2)	(3)
VARIABLES	ROAE	ROAE	ROAE	ROAE	ROAE	ROAE
L.ROAE	0.169	0.168	0.311**	0.517***	0.461***	0.147*
	(0.137)	(0.129)	(0.154)	(0.148)	(0.122)	(0.082)
Asset Diversification	-0.372**			-0.511		
	(0.802)			(0.721)		
Funding Diversification		-0.288			-0.899	
		(0.818)			(0.270)	
Income Diversification			0.962***			0.965***
			(0.917)			(0.999)
Constant	0.121	-0.865	-0.216	0.509	0.275	0.838**
	(0.127)	(0.573)	(0.242)	(0.969)	(0.779)	(0.940)
Observations	981	981	976	1,317	1,317	1,316
AR(2)	0.068	0.079	0.086	0.182	0.181	0.259
Sargan	0.697	0.109	0.450	0.385	0.414	0.214

The GMM estimation results for South Asian banks (2011–2023) use ROAE as the dependent variable and asset, funding, and income diversification (measured as sum of squares to capture nonlinearity) as key independents, with consistent control variables across models. Hansen/Sargan tests assess overidentification, AR (2) checks serial correlation, and heteroskedasticity-robust standard errors are in parentheses; significance is denoted as ***p<0.01, **p<0.05, *p<0.1.

4.5. Robustness Analysis

In this subsection, we present empirical findings that support our baseline results, utilizing average returns on equity, assets, and diversification for a sample of South Asian banks. Here we used an alternative measure for performance named Net Interest Margin (NIM). In Table 8 the empirical analysis uses a robust and clustered approach for standard errors to deal with autocorrelation and the problem of heteroskedasticity. Here, we also use loan diversification for the validity of diversification variables used in baseline analysis. The empirical results confirm that coefficients remain consistent with NIM to the results for ROAE and ROAA with minor differences in significance. However, the sign remains consistent, which supports the estimated parameters for interpreting the conclusions. For example, the impact of assets and funding diversification is negative on NIM, which is consistent with the results of ROAA and ROAE in most of the previous estimations. In addition to it, Table 9 expresses that the findings of loan diversification are also consistent with the coefficient of asset diversification, meaning the impact of loan diversification on NIM is negative. The findings highlight the importance of asset diversification for optimal results (Athanasoglou, Brissimis, & Delis, 2008).

Table 8: Diversification and Net Interest Margin

	(1)	(2)	(3)	(1)	(2)	(3)
VARIABLES	NIM	NIM	NIM	NIM	NIM	NIM
L.NIM	0.443***	0.423***	0.447***	0.328***	0.314***	0.337***
	(0.079)	(0.082)	(0.077)	(0.101)	(0.105)	(0.100)
Asset Diversification	-0.005**			-0.002		
	(0.002)			(0.002)		
Funding Diversification		-0.009***			-0.006***	
		(0.002)			(0.002)	
Income Diversification			0.002***			0.002***
			(0.001)			(0.001)
Observations	3,577	3,577	3,570	3,577	3,577	3,570
AR(2)	0.703	0.742	0.764	0.926	0.971	0.998
Sargan	0.513	6.635	0.139	0.220	0.148	0.139

The GMM estimation results for South Asian banks (2011–2023) use NIM as the dependent variable and asset, funding, and income diversification (measured as sum of squares to capture nonlinearity) as key independents, with consistent control variables across models. Hansen/Sargan tests assess overidentification, AR (2) checks serial correlation, and heteroskedasticity-robust standard errors are in parentheses; significance is denoted as ***p<0.01, **p<0.05, *p<0.1.

Table 9: Loan diversification and performance

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	ROAA	ROAE	NIM	ROAA	ROAE	NIM
Lagged performance	0.600***	0.587***	0.837***	0.312***	0.460***	0.329***
	(0.076)	(0.074)	(0.050)	(0.110)	(0.086)	(0.101)
Loans diversification	-0.002*	-2.254**	-0.001	-0.004**	-2.065*	-0.001
	(0.001)	(1.031)	(0.001)	(0.001)	(1.183)	(0.001)
Observations	3,577	3,525	3,577	3,577	3,525	3,577
Cross-sections	570	569	570	570	569	570
AR(2)	0.204	0.432	0.619	0.388	0.614	0.942
Sargan	0.444	0.451	0.500	0.690	0.230	0.198

The GMM estimation results for South Asian banks (2011–2023) use ROAE as the dependent variable and asset, funding, and income diversification (measured as sum of squares to capture nonlinearity) as key independents, with consistent control variables across models. Hansen/Sargan tests assess overidentification, AR (2) checks serial correlation, and heteroskedasticity-robust standard errors are in parentheses; significance is denoted as ***p<0.01, **p<0.05, *p<0.1.

5. Conclusion and policy recommendations

The aim of the study is to examine the impact of assets, funding, and income diversification on the performance of South Asian banks over the period from 2011 to 2023. In addressing this objective, we found two aspects to conclude for our empirical findings to support the existing theories and hypotheses in the context of banking. One viewpoint posits that utilizing the expertise to improve the performance of banks as suggested by corporate supporters (Jensen & Meckling, 2019). The second theory is in line with banking assumptions, which document that diversification is based on the banks' preference requirements (Boyd & Prescott, 1986). The findings confirm that the diversification on the assets side of the bank balance sheet is inversely impacting the profitability of South Asian banks, which need to revise and readjust to convert its negative impact to a positive one. The findings remain consistent for well-capitalized and under-capitalized banks as well. The impact of funding diversification is negative on the performance of South Asian banks, which is in line with the trade-off hypothesis, which means the cost of financing is higher than the returns of funding. However, the income diversification is beneficial for banks to boost up their profits, which implies that banks should increase their source of incomes in addition to their interest-based earnings. The findings remain consistent for well-capitalized and under-capitalized banks. They also remain robust when using alternative proxies on both sides of the equations.

This study offers important insights for banking management and policy, emphasizing that income diversification can greatly improve profitability. Nonetheless, it underscores the importance of meticulous management in funding diversification to prevent margin erosion. Bank managers ought to prioritize the enhancement of non-interest income while maintaining diligent oversight of funding sources. It is recommended that policymakers create frameworks that facilitate balanced diversification, especially for under-capitalized banks, in order to reduce risks. The research highlights the significance of strategic flexibility in responding to economic fluctuations, which can improve performance throughout various business cycles. Ultimately, customized regulations that foster advantageous diversity and tackle funding challenges are essential for sustainable banking growth.

The study's findings are based on a small dataset and may not accurately reflect different banking systems, particularly in emerging economies. Its application is limited by the sample size, time span, and changing economic and regulatory situations. Potential endogeneity difficulties and unobservable factors such as management quality or market conditions may have an impact on findings. While NIM, ROAA, and ROAE are important financial indicators, qualitative elements like customer satisfaction and innovation are often overlooked. Furthermore, the methodology takes inflation and economic development into consideration but leaves out other important variables such as interest rates, exchange rates, and geopolitical concerns, all of which could have an impact on bank performance. By recognizing these shortcomings, the study promotes additional investigation to expand on its conclusions and resolve these possible limits in order to obtain a more thorough grasp of banking diversification tactics.

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