

Examining the Nexus Between Income Diversification and Profitability of Indian Banks

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ABSTRACT

The majority of financial institutions use some type of diversification in order to mitigate risk and enhance performance. This current research focuses on how the increasing diversity has affected the financial performance of banks in India. This study aims to address this question as its main purpose. The researchers used bank-level data of 46 banks from the years 2011 to 2022 for this empirical research. The researchers employed system GMM approach and found out the positive impact of income diversification on risk adjusted return on assets and risk adjusted return on equity. The study contributes to the existing literature in numerous ways.

1. Introduction

Banks, as financial intermediaries, have traditionally depended on interest income as their main source of revenue. Technological innovation, deregulation, and financial liberalization have led to intense rivalry, consolidation, and structural changes in the banking industry in recent decades (Park et al., 2019). In addition, there have been faster advancements in finance, leading to increased accessibility of financial services (Hakimi et al., 2012; Ishfaq et al., 2022).

In response to the growing pressure on interest income, banks are exploring the possibility of augmenting their revenue through non-interest sources. Due to decrease in interest margins resulting from heightened market competition, it has become essential to augment interest income with non-interest revenue. Non-interest revenue is becoming more prevalent in the income statements of banks in both established and developing economies. The global trend of transitioning from interest-based revenue to non-interest-based revenue is well-documented (Hahm, 2008). The components of non-interest income for the banks are the fee, trading income, and commission (Ashraf et al., 2023; Isshaq et al., 2019).

An income diversification strategy allows banks to gain several advantages, such as higher profits (Chiorazzo et al., 2008), greater competitive advantages when entering new markets (Amidu and Wolfe, 2013), cost savings due to economies of scale (Meslier et al., 2014), and reduced risk (Delpachitra and Lester, 2013; Sharma and Anand, 2018). Nevertheless, the multitude of expenses linked to diversification can often be disadvantageous for banks. The costs mentioned encompass knowledge asymmetry

(Harris et al., 1982), suboptimal allocation of resources (Rajan et al., 2000), and increased risk (Lepetit et al., 2008). According to DeYoung and Roland (2001), the bank-customer relationship is less strong in non-lending operations, resulting in lower income. Non-interest-based income is inherently more volatile than traditional interest income. In addition, diversifying into activities that are not reliant on interest may lead to an increase in fixed expenses related to investing in human capital and technology, resulting in a significant rise in operational costs and fluctuations in profitability. Nevertheless, there is a lack of consensus regarding the extent to which revenue diversification might enhance the performance of banks (Luu et al., 2020).

The study contributes to the existing literature in numerous ways. Firstly, the issues of diversification and performance have received considerable scholarly focus in recent years. However, there is a lack of focus on growing countries, especially India. An examination of the Indian banking sector from the standpoint of diversification will enhance the current body of research. Secondly, recent studies have mostly focused on examining the determinants of bank profitability and risk. However, there has been a lack of focus on the relationship between income diversification and bank profitability. Lastly, the investigation employed a system GMM regression method with a dynamic panel data model. On the other hand, the pertinent research that examines Asian countries primarily revolves around a fixed panel data methodology. The research would ultimately enhance and complement existing studies conducted in Asian countries (Nisar et al., 2018; Lee et al., 2014; Ahamed, 2017; Berger et al., 2010; Nguyen et al., 2012).

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The rest of the paper is organized as follows: section 2 contains the theoretical background for the study and examines the prior research on the issue. Section 3 presents the details of the data and the research methodology. The data analysis has been reported in section 4 and the findings has been discussed in section 5. Finally section 6 concludes the paper.

2. Theoretical Background

The primary hypothesis explored in this work is the "portfolio theory." Harry Markowitz is credited as the originator of the portfolio theory. The theory was first introduced by Markowitz in his 1952 publication on "portfolio selection" and "foundations of portfolio theory" (Markowitz, 1991). The primary principle of "portfolio selection" is that investors should distribute their capital across securities that offer the highest expected return and the lowest variance, in order to achieve diversification. Given this premise, the law of large numbers cannot be applied to a portfolio of securities. The returns from securities exhibit a significant degree of intercorrelation. Diversification is unable to completely reduce all forms of variance, as stated by Markowitz in 1952. The contemporary portfolio theory is a strategy used by cautious investors to construct their portfolio in order to maximize their expected rate of return while taking into account a predetermined level of market risk. The portfolio theory states that diversified banks benefit from economies of scale, which enhance performance and concurrently lower risk (Nisar et al., 2018).

The existing body of literature presents two opposing impacts of income diversification on bank profitability. The proponents claim that banks can gain advantages from income diversification by utilizing managerial skills and economies of scope (Iskandar-Datta and McLaughlin, 2007; Lown et al., 2000). Further support for this argument can be found in the studies conducted by Baele et al. in (2007), Sanya and Wolfe (2011), Nguyen et al., (2012), Pennathur et al. (2012), and Meslier et al. (2014). Lee et al. (2014) provide similar results for 29 Asia-Pacific nations, showing a favorable correlation between income diversification and bank performance.

In contrast, Maudos and Solís (2009) emphasize a detrimental correlation between non-interest revenue and net interest margins for Mexican banks. Batten and Vo (2016) discovered that Vietnamese banks that have transitioned to non-interest revenue operations experience elevated levels of risk. In this study, Hidayat et al. (2012) investigated the correlation between product diversification and bank risk in Indonesian banks. They demonstrated that the impact of diversification is contingent upon the size of the bank. In their study, Berger et al. (2009) analyzed a panel of 88 Chinese banks from 1996 to 2006. They discovered that diversification led to decreased earnings and increased expenses. On the other

hand, Zhou (2014) analyzed sixty-two Chinese commercial banks from 1997 to 2012 and concluded that there is no substantial link between revenue diversity and bank risk. Furthermore, diversification could weaken the management's competitive advantage (e.g., Klein and Saldenberg, 2010) and heighten profit volatility (e.g., DeYoung and Roland, 2001; Stiroh, 2004; Acharya et al., 2006; Stiroh and Rumble, 2006). The majority of the empirical evidence is inconclusive and primarily derived from advanced economies. Limited knowledge exists on emerging market economies, such as India.

From the above literature, it is clear that the examination of the impact of income diversification on bank profitability and risk taking has yielded mixed results. Therefore, it is imperative to ponder more over this issue. This study is an attempt to examine the influence of income diversification on bank profitability and risk in India.

3. Research Methodology

This section entails discussion about the data and the sample. It also gives a description of the variables and the empirical estimation model used in this research.

3.1 Data and Sample

The research is based on a sample size of 46 scheduled commercial banks in India. The final data set consists of unbalanced panel data, with 782 observations from 2011 to 2022. The data on firm specific variables was sourced from the Prowess IQ database of Centre for Monitoring Indian Economy (CMIE). The analysis additionally incorporates macroeconomic control variables which were sourced from the World Bank database. The final sample consisted exclusively of banks that had a minimum of three consecutive years of time series observation and were continually operational during the study period. In order to mitigate the influence of measurement errors and prevent the potential distortion caused by outliers, the variables utilized in the models were winsorized at the 1% level.

3.2 Description of Variables

Table 1 gives the details about the variables used in the research and their operationalization.

3.3 Empirical Model

The researchers used the dynamic panel data model as represented by the equation (1)

$$RROA_{it} = \alpha + \delta RROA_{it-1} + \beta_1 ID_{it} + \sum_{j=2}^J \beta_j X_{it}^j + \sum_{l=2}^L \beta_l X_{it}^l + \varepsilon_{it} \quad \text{Eq (1)}$$

Where $RROA_{it}$ is the risk adjusted return on asset of bank i at time t , with $i=1, \dots, N$, $t=1, \dots, T$, α a constant, $RROA_{it-1}$ is the one period lagged dependent variable and δ is the speed of adjustment to equilibrium, ID_{it} is a measure of income diversification of bank i at time t , X_{it}^j are the bank specific control variables and X_{it}^l are the macroeconomic indicators that are to be controlled, ε_{it} is the error term.

Table 1 : Description of Variables

Classification	Variable	Operationalisation	Prior Literature
Dependent Variable			
Bank Performance Measures	Risk adjusted return on assets (RROA)	(ROA / σ ROA)	Alkhoury and Arouri (2019)
Independent Variable			
Bank Diversification	Income Diversification (ID)	$\frac{\text{Non - interest income}}{\text{Total Income}}$	Stiroh (2004a), Stiroh and Rumble (2006), Gompers et al. (2003),
Control Variables			
Bank-specific	Size (SZ)	Log (Total Assets)	Stiroh and Rumble, (2006); Baele et al., (2007); Sanya and Wolfe (2011)
	Equity Ratio (ER)	$\frac{\text{Equity Capital}}{\text{Total assets}}$	Chiorazzo et al., (2008); Meslier et al., (2014)
	Credit Risk (CR)	$\frac{\text{Loan Loss Provisions}}{\text{Total assets}}$	Mergaerts and Vander , (2016)
	Asset Growth (AG)	Annual growth rate of total assets	Stiroh, (2004); Demirgüç-Kunt and Huizinga, (2010); Pennathur et al., (2012)
	Loan Ratio (LR)	$\frac{\text{Total loans}}{\text{Total assets}}$	Stiroh and Rumble, (2006); Chiorazzo et al., (2008); Chortareas et al., (2011);
Macroeconomic Control Variables	GDP Growth rate (GGDP)	$\frac{\text{GDP}_t - \text{GDP}_{t-1}}{\text{GDP}_{t-1}}$	Pasiouras & Kosmidou, (2007); Petria et al., (2015); Rani & Zergaw, (2017);
	Annual Inflation rate (IF)	Consumer Price Index (CPI)	Anbar & Alper, (2011); Chowdhury & Rasid, (2017); Jara-Bertin et al., (2014)

$$RROE_{it} = \alpha + \delta RROE_{it-1} + \beta_1 ID_{it} + \sum_{j=2}^J \beta_j X_{it}^j + \sum_{l=2}^L \beta_l X_{it}^l + \varepsilon_{it} \dots \text{Eq (2)}$$

Where $RROE_{it}$ is the risk adjusted return on asset of bank i at time t , with $i=1, \dots, N$, $t=1, \dots, T$, α a constant, $RROE_{it-1}$ is the one period lagged dependent variable and δ is the speed of adjustment to equilibrium, ID_{it} is a measure of income diversification of bank i at time t , X_{it}^j are the bank specific control variables and X_{it}^l are the macroeconomic indicators that are to be controlled, ε_{it} is the error term.

The aforementioned dynamic panel models has been estimated using the generalized method of moments (GMM) estimator established by Arellano and Bover (1995) and Blundell and Bond (2000). The researchers employed a one-step system Generalized Method of Moments (GMM) instead of a two-step system GMM since the former yields a smaller standard deviation of the

estimated results and reduces bias (Judson and Owen, 1999). Additionally GMM offers the benefit of avoiding issues related to autocorrelation and heteroskedasticity in the model, resulting in superior outcomes when compared to ordinary least squares (OLS).

4. Data Analysis and Findings

This section contains the discussion on data analysis and the major findings of the current research study. Table 2 gives a summary of the descriptive statistics of the various variables used in this study. The mean value of the dependent variable in equation 1 which is risk adjusted return on assets (RROA) is 3.123 and the mean value of the dependent variable in equation 2 which is risk adjusted return on equity (RROE) is 4.255. The minimum value of RROA and RROE is -3.218 and -2.245 across the sample

Table 2 : Descriptive Statistics

Variables	Mean	SD	Min	Max	Obs
Dependent variable: Performance Measure					
RROA	3.123	1.127	- 3.218	6.948	782
RROE	4.255	1.098	- 2.245	7.224	
Independent variable : Income Diversification Measure					
ID	0.214	.046	0.047	0.645	782
Control variables					
SZ	1.367	0.047	0.223	0.737	782
ER	0.054	0.016	- 0.156	0.145	782
CR	8.291	0.675	6.07	6.99	782
AG	0.083	0.042	0.012	0.464	782
LR	0.011	0.012	0.015	0.026	782
GGDP	5.118	0.412	3.260	7.123	782
IF	5.898	0.921	4.590	6.167	782

Table 3 : Pearson Correlation Matrix

Variables	RROA	RROE	ID	SZ	ER	CR	AG	LR	GGDP	IF
RROA	1									
RROE	0.45*	1								
ID	0.56*	0.62*	1							
SZ	0.35	0.54	0.63*	1						
ER	0.44*	0.28	0.54	0.49	1					
CR	0.61	0.48	0.32*	0.43*	0.26	1				
AG	0.22	0.38	0.67*	0.59	-0.46	0.19	1			
LR	0.34*	0.29	-0.49	0.39*	0.25	0.37	0.62	1		
GGDP	0.12	0.23	0.26	0.48	0.30	-0.56	0.22	0.14*	1	
IF	0.33	0.46	0.53*	0.49	0.22	0.39*	-0.11	0.61*	0.42	1

* Significant at 5% level

indicating that there were some loss making banks as well during the study period.

The descriptive statistics of the independent variable which is the income diversification and other control variables are also given in Table 2.

The table 3 above displays the Pearson correlation coefficient between various variables used in the study. The correlation coefficient between income diversification and size is the highest at 0.63 and is significant at 5% level of significance. The lowest correlation coefficient of -0.11 is between asset growth rate and inflation rate. This correlation is insignificant. Overall, all the correlation coefficients between the independent variables is less than 0.8 which indicates the absence of multicollinearity amongst the independent variables.

The Table 5 gives the results of the system Generalized Method of Moments (GMM) dynamic panel regression model. In the second column, system GMM results have been displayed for equation 1 in which risk adjusted return on assets (RROA) is the dependent variable. The regression coefficient of one lagged period RROA is 0.123 and is significant at 5% level of significance. It confirms the dynamic nature of the model. The principal variable of interest is the coefficient of income diversification which is 0.12 and is significant at 1% level of significance indicating that there is a significant positive influence of income diversification on the bank's risk adjusted return on assets.

The third column of table 5 displays system GMM results for equation 2 in which risk adjusted return on equity

Table 4 : Effect of Income Diversification on Profitability

Dependent Variable Model	RROA (1)	RROE (2)
RROA (-1)	0.123** (1.967)	-
RROE (-1)	-	0.146** (1.934)
ID	.012*** (3.278)	.017*** (2.983)
SZ	.002** (1.922)	.011** (1.976)
ER	.014* (1.123)	.016 (0.792)
CR	.023 (0.683)	.026* (1.065)
AG	.017 (0.432)	.014 (0.598)
LR	.026** (2.061)	.032** (1.989)
GGDP	.022* (1.122)	.028* (1.357)
IF	.013 (0.835)	.015 (1.010)
Constant	1.22	1.67
Adj. R Squared	22.563	26.242
J-statistic	.502	.613
AR(1)	.017	.029
AR(2)	.015	.121
No. of Observations	782	782

Note : The table shows the system GMM estimation results of the equation (1) and equation (2)

(RROE) is the dependent variable. The regression coefficient of one lagged period RROE is 0.146 and is significant at 5% level of significance. It confirms the dynamic nature of the model. The principal variable of interest is the coefficient of income diversification which is 0.17 and is significant at 1% level of significance indicating that there is a significant positive influence of income diversification on the bank's risk adjusted return on equity.

The results of the system GMM confirms the positive influence of income diversification on risk adjusted return on assets and risk adjusted return on equity for Indian banks.

5. Conclusion and Implications

This research investigates the influence of diversification policies on the performance of banks in India. Over the

last several decades, India has implemented strong financial sector liberalization reforms, leading to the emergence of more competitive banks and the development of stock markets. As a result, banks have expanded their operations to include activities other than lending, particularly in assets that do not generate interest and in services that provide non-interest revenue, in order to sustain profitability. However, the question of how the increasing diversity has affected the financial performance of banks in India has not been extensively studied. This study aims to address this question as its main purpose. The researchers used bank-level data of 46 banks from the years 2011 to 2022 for this empirical research. The researchers employed system GMM approach and found out the positive impact of income diversification on risk adjusted return on assets and risk adjusted return on equity. Based on our research, we determine that banks may enhance their financial performance by expanding into novel financial products and services. The implementation of a plan aimed at diversifying income streams effectively improves the performance of Indian banks.

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