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Non-Interest Income, Banking Risk, And Earnings Volatility: An Econometric Study On Indian Public Sector Banks

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Abstract:

This study investigates non-interest income (NII) and its association on both risk and earnings volatility in Indian public sector banks from 2009-10 to 2023-24. Using a sample of the ten largest public sector banks, we examined both total NII and its components—fee income, trading income, and other income—to better understand their impact on bank risk and profit. Risk was quantified using Z-Score, RAROA, and RACAR, while control variables included loan-to-deposit ratio (LDR), net interest margin (NIM), bank size, and GDP growth. The data show that while NII generally reduces the risk profile, it has a mixed effect on profitability (RAROA) and risk-adjusted returns (RACAR). Bank size and operational efficiency, as measured by NIM, considerably improve stability and profitability, but LDR and GDP growth have little effect. This shows that internal bank factors dominated macroeconomic conditions in determining risk and performance during the research period. The findings of our study have implications for the banks exposed to earning Non-traditional sources of revenue hence exposure to various risks.

Keywords: Net Interest Margin, Banking, Risk measurement, Z-Score, GDP growth

JEL Classification: G15, , G28, G32, G01, G21

1. INTRODUCTION:

In the early 1990s, India launched financial liberalization strategies to boost bank efficiency by deregulating interest rates, lowering entrance hurdles, and altering other banking regulations. These reforms established a competitive market in which public and private banks (both domestic and foreign) compete for customers. In this cut throat competitive banking era, to increase income sources, banks are moving forward to generating revenue from non-traditional sources like fee based incomes, Off-balance sheet incomes, trading incomes, and other incomes except interest. But shifting to earning revenue from these sources ushering banks towards various risk exposures. This paper through lights on the relationship between the risk exposures and volatility of their earnings with Non-interest incomes. Most previous research revealed minimal gain in non-interest revenue, which was explained by its higher volatility. However, more recent study using data from the financial crisis demonstrates certain advantages. Demirgüç-Kunt and Huizinga (2010) found that low amounts of non-interest income reduce risk, but Altunbas, Manganelli, and Marques-Ibáñez (2011) imply a diverse revenue structure can be helpful. Both findings confirm Köhler's (forthcoming) conclusion that boosting a bank's non-interest income can greatly improve its stability. Diversification in banking has been extensively researched. According to these findings, revenue diversification can be economically beneficial because it minimizes risk. Diversifying products may also improve the risk-reward trade-off by broadening investing options. Diversification can occasionally strain managerial resources and disrupt operational stability. Traditionally, banks make money by facilitating deposits and loans and gaining margin interest. With disintermediation and greater competition, this revenue source has reduced (Reserve Bank of Australia, 2004), posing a risk to the financial system. Fee revenue is frequently thought to be more stable than margin income (Smith et al., 2003), although DeYoung and Roland (2001) provide evidence that it may be less stable. While European research (Smith et al., 2003) suggests non-interest revenue lowers bank risk, certain US research (DeYoung and Roland, 2001) and Stiroh (2004b) find fee income more volatile than margin income. Diversification into non-interest income increases systematic risk while decreasing overall risk, claim Baele et al. (2007). Given the conflicting results (e.g., Stiroh, 2004a; DeYoung and Roland, 2001) and the little evidence from Australia, more research into various institutional contexts is necessary.

This study addresses three major difficulties. First, we utilize the Z-Score as a proxy to investigate the relationship between total risk, solvency risk, and a bank's non-interest revenue. Second, we separate risk into two additional components: RAROA and RACOR. These variables measures the returns with respect to risk exposures and evaluate capital sufficiency in light of the risks it faces. Adjusting capital for risk provides a better picture of a bank's ability to absorb possible losses. A greater RACOR means that a bank has more capital per unit of risk. No earlier study has broken down bankruptcy risk and

examined the link with non-interest income for each component. Third, we divide NII into three subcategories: fee income, trading income, and other non-interest income, to see how these components influence bankruptcy risk and its two sub-measures.

2. LITERATURE REVIEW AND FINDING THE RESEARCH GAP:

Although the topic under study versus diversification for conglomerates has been extensively studied in corporate finance literature (Berger and Ofek, 1995; Campa and Kedia, 2002), the literature may not be applicable to financial institutions because they frequently deal with a number of contradictory regulations that provide incentives for either diversification or focus of their asset portfolios (Laeven and Levine, 2007). While regulators typically promote diversification as a risk-reduction strategy, restrictions on asset investments, new entry, and branching typically encourage focus (Acharya et al., 2006). Businesses should concentrate to prevent inefficient resource allocation, which can be caused by internal power struggles across divisions (Rajan et al., 2000) or by issues with cross-subsidization or excessive investment among the various business segments (Berger and Ofek, 1995). Stiroh (2004) investigates the relationship between bank revenue and profit volatility and the increasing reliance on non-interest income. Their study's findings, both overall and for the bank sample, showed no proof that this change gives significant benefits for diversification in the form of more consistent revenue or profitability. Between 1989 and 2001, non-interest revenue accounted for 40% of total operating income at 4,712 U.S. banks, according to DeYoung and Rice (2004). Additionally, they found that the benefits of diversification were occasionally surpassed by the risk-return trade-off; as a result, well-managed banks progressively expanded their non-interest-earning operations. They came to the conclusion that non-interest income enhances interest revenue rather than takes its place. Because non-interest revenue is very variable, Stiroh and Rumble (2006) utilized it to assess income diversification for commercial banks in the United States between 1997 and 2002. They determined that increased non-interest revenue exacerbates the banks' risk-return trade-offs. Income volatility is sometimes advised to be decreased by shifting toward non-interest income that is more stable or less associated with interest income. However, Smith et al. (2003) state that the majority of non-interest income comes from commissions, fees, and trading revenue.Revenue from commissions and fees is more steady than interest income, even though trading income could be more erratic. According to Stiroh (2004), the relationship between interest income and non-interest income increased between 1990 and 2001 as opposed to 1984 and 1989.

Furthermore, non-interest revenue activities incur lower switching and information costs than traditional loan operations (DeYoung and Roland, 2001). The majority of research has focused on banking risk and how it affects non-interest revenue and financial performance. Despite the rising literature on the relationship between non-interest income (NII) and bank performance, notably in developed nations, there have been very few rigorous econometric research on Indian Public Sector Banks (PSBs). Existing research contains significant gaps: most studies focus on private banks or banks

in developed areas such as the United States or Europe. Longitudinal econometric evidence is scarce about the impact of NII on bank risk, volatility of earnings, and risk-adjusted performance in public sector banks.

3. OBJECTIVES OF THE STUDY:

I) To examine the association between overall risk and a bank's non-interest income

II) To estimate the return generated by a bank relative to the risk-weighted assets (RWA) it holds and to measure of a bank's capital adequacy relative to the risk it faces.

III) To find out the impact of NIIs components on banks and its risk adjusted Performance.

4. HYPOTHESIS OF THE STUDY:

H01: There is no significant nexus between and non-interest income and risk of Indian public sector banks.

H02: There is no relationship between banks' risk-weighted assets (RWA) and their non-interest revenue.

H03: The various components of NII have no meaningful link with the risk-adjusted performance of Indian public sector banks.

5. DATA, VARIABLES AND MODELS:

5.1 Data: In this paper, we do an econometric study using two datasets. The first dataset comes from the CMIE's Prowess database. We collected data on ten Indian public sector banks sorted by NSE market capitalization from 2010 to 2024. The Prowess data is supplemented by information from the Reserve Bank of India. Our sample only includes public-sector banks. The banks chosen include State Bank of India, Canara Bank, Indian Bank, Indian Overseas Bank,Punjab National Bank, Central Bank of India, , Bank of India, Bank of Baroda, Bank of Maharashtra, and Union Bank of India.

5.2 Variables

Table 1 depicts the different variables used in this study.

Classification	Variables	Definition	Source
Dependent Variables	Z-Score	(ROA + CAR) / SDROA	Lepetit et al. (2008)
	RAROA	ROA / SDROA	Bustaman et al. (2016)
	RACAR	CAR / SDROA	Kohler (2014)
Independent Variables	Non-Interest Income (NII)	NII / Total Income	Altunbas et al. (2011)
	Fees Income (FI)	Commission, exchange, and brokerage income	Altunbas et al. (2011)
	Trading Income (TI)	Income from investments & derivatives	Stulz (2012)
	Other Income (OI)	Sale of assets and other income	Stulz (2012)
Control Variables	Size	Log of total assets	Altunbas et al. (2011)
	Loan to Deposit Ratio (LDR)	Loans / Deposits	Kohler (2014)
	Net Interest Margin (NIM)	Interest received – Interest paid	Stulz (2012)
	GDP Growth	GDP growth rate	Kohler (2014)

Source: *Self compiled*

5.3 Empirical Models

We use the following dynamic panel GMM regression model to assess how non-interest income affects bank risk and returns in Indian public sector banks. When explanatory variables are linked to the error term, endogeneity can provide skewed and inconsistent results, which is a fundamental problem in panel data econometrics (Wooldridge, 2010). This problem is not effectively addressed by the Ordinary Least Squares (OLS), Fixed Effects (FE), and Random Effects (RE) estimators. Endogeneity is especially important in this study, which looks at the link between non-interest income, banking risk, and profitability volatility in Indian public sector banks.

There are numerous sources of endogeneity in the current situation. The first issue is the possibility of reverse causality. The risk exposure itself may also dictate management's approach to boosting or decreasing reliance on non-interest revenue, even though diversification into non-interest income may have an impact on banks' risk profiles. In a similar vein, earnings volatility affects banks' future risk preferences in addition to being a consequence of risk-taking.

Second, the dynamic panel bias or Nickell bias is introduced when a lagged dependent variable, like historical risk or profitability, is included in the regression framework (Nickell, 1981). Because the error term and the lagged dependent variable have a mechanical correlation, estimators like FE.

As a result, these characteristics indicate the presence of probable endogeneity in our dataset, which justifies the implementation of a dynamic panel GMM model. Once the model is created, diagnostic tests will confirm our assumptions, allowing us to move forward with the study.

$$y_{ip} = \alpha + \beta_{i1}x_{i1} + \beta_{i2}x_{i2} + \beta_{i3}x_{i3} + \ldots\ldots\ldots + \beta_{ij}x_{ij} + €$$

where;

y_{ip}= ith observation of the dependent variable over period p
x_j= independent variables. J= 1, 2, 3, …k.
x_{ij}= ith observation of the jth independent variables.
α = Intercept term
€= Residual term/ Error term

Hence from this model the following econometric models have been developed.

Dependent variable =Z-Score

$$y_{ip} = \alpha + \beta_{i1}NII_{i1-1} + \beta_{i2}Size_{i2-1} + \beta_{i3}LDR_{i3-1} + \beta_{i4}NIM_{i4-1} + \beta_{i5}GDP_{i5-1}\ldots\ldots\ldots + \beta_{ij}x_{ij} + € \quad \text{\_\_\_\_\_eq-3}$$

Dependent variable =RAROA

$$y_{ip} = \alpha + \beta_{i1}NII_{i1-1} + \beta_{i2}Size_{i2-1} + \beta_{i3}LDR_{i3-1} + \beta_{i4}NIM_{i4-1} + \beta_{i5}GDP_{i5-1}\ldots\ldots\ldots + \beta_{ij}x_{ij} + € \quad \text{\_\_\_\_\_eq-2}$$

Dependent variable =RACAR

$$y_{ip} = \alpha + \beta_{i1}NII_{i1-1} + \beta_{i2}Size_{i2-1} + \beta_{i3}LDR_{i3-1} + \beta_{i4}NIM_{i4-1} + \beta_{i5}GDP_{i5-1}\ldots\ldots\ldots + \beta_{ij}x_{ij} + € \quad \text{\_\_\_\_\_eq-3}$$

To evaluate the impact of the components of non-interest income on risk-adjusted returns and performance of Indian public sector banks, we develop the following models.

Dependent variable =Z-Score

$$y_{ip} = \alpha + \beta_{i1}FI_{i1-1} + \beta_{i2}TI_{i2-1} + \beta_{i3}OI_{i3-1}\ \beta_{i4}Size_{i4-1} + \beta_{i5}LDR_{i5-1} + \beta_{i6}NIM_{i6-1} + \beta_{i7}GDP_{i7-1} \ldots\ldots\ldots + \beta_{ij}x_{ij} + € \quad \_\_\_\_\_ eq\text{-}1$$

Dependent variable =RAROA

$$y_{ip} = \alpha + \beta_{i1}FI_{i1-1} + \beta_{i2}TI_{i2-1} + \beta_{i3}OI_{i3-1}\ \beta_{i4}Size_{i4-1} + \beta_{i5}LDR_{i5-1} + \beta_{i6}NIM_{i6-1} + \beta_{i7}GDP_{i7-1} \ldots\ldots\ldots + \beta_{ij}x_{ij} + € \quad \_\_\_\_\_ eq\text{-}1$$

Dependent variable =RACAR

$$y_{ip} = \alpha + \beta_{i1}FI_{i1-1} + \beta_{i2}TI_{i2-1} + \beta_{i3}OI_{i3-1}\ \beta_{i4}Size_{i4-1} + \beta_{i5}LDR_{i5-1} + \beta_{i6}NIM_{i6-1} + \beta_{i7}GDP_{i7-1} \ldots\ldots\ldots + \beta_{ij}x_{ij} + € \quad \_\_\_\_\_ eq\text{-}1$$

6.RESULTS:

Table: 2 Descriptive Statistics:

Statistic	Z-score	RAROA	RACAR	NII	FI	TI	OI	SIZE	LDR	NIM	GDP
Mean	20.48	0.57	20.37	0.12	0.04	0.04	0.05	5.69	70.36	2.47	6.28
Median	17.60	0.65	17.48	0.12	0.04	0.03	0.04	5.65	71.49	2.44	6.80
Maximum	140.00	10.50	129.50	0.25	0.12	0.11	0.13	6.79	86.94	3.62	10.26
Minimum	8.74	-3.56	10.89	0.07	0.01	0.00	0.01	4.85	46.99	1.54	-5.78
Std. Dev.	12.75	1.50	12.87	0.03	0.02	0.02	0.03	0.40	7.79	0.41	3.66
Observations	143	143	143	143	143	143	143	143	143	143	143

Source: *E-views output*

The descriptive statistics shown in Table-2 explains that while the large range (8.74–140) implies significant variation in bank risk, the average Z-score (20.48) indicates moderate financial stability of Indian PSBs. While risk-adjusted performance measures like RACAR (mean 20.37) and RAROA (mean 0.57) show overall profitability, the existence of negative values indicates times when certain banks are losing money. PSBs continue to rely heavily on interest income, as seen by the low non-interest income (NII) share of 12% and the minimal contributions of fee income, trading income, and miscellaneous income. There is little variance in bank size (mean log assets = 5.69), suggesting that PSBs are all the same. A balanced lending approach is shown in the loan-to-deposit ratio (70%) and the NIM (2.47%), which indicates moderate but steady intermediation efficiency. Finally, the GDP variable (mean 6.28,

range -5.78 to 10.26) captures both expansionary and contractionary phases of the Indian economy, validating its inclusion as a macroeconomic control. Overall, the statistics highlight PSBs' limited diversification of income, variations in risk levels, and sensitivity to macroeconomic conditions.

Table 3: Pearson's Coeffiecient of correlation

	Z-Score	*RAROA*	*RACAR*	*NII*	*FI*	*TI*	*OI*	*Size*	*LDR*	*NIM*	*GDP*
Z-Score	1.00										
RAROA	0.78	1.00									
RACAR	0.91	0.76	1.00								
NII	-0.02	-0.12	0.00	1.00							
FI	-0.06	-0.04	-0.08	0.20	1.00						
TI	0.00	-0.12	0.06	0.57	-0.23	1.00					
OI	0.02	-0.03	0.03	0.65	-0.39	0.17	1.00				
Size	0.10	0.02	0.06	0.30	0.23	-0.01	0.19	1.00			
LDR	0.26	0.43	0.21	-0.36	0.08	-0.35	-0.25	0.12	1.00		
NIM	0.26	0.48	0.19	-0.05	0.31	-0.48	0.03	0.00	0.39	1.00	
GDP	0.06	0.22	0.08	-0.03	0.03	0.11	-0.14	-0.07	0.10	0.02	1.00

Source: *E-views output*

The correlation results show that profitability metrics like RAROA and RACAR are strongly related to bank stability (Z-score), indicating that resilience is strengthened by higher earnings. However, non-interest income has little to no correlation with stability and profitability, indicating that it plays a small part in Indian PSBs. Only other income exhibits some positive correlation among its constituents. Due to the prevalence of interest-based operations, traditional banking metrics like the LDR and NIM continue to have a strong correlation with stability and profitability. The weak impact of GDP growth suggests that bank-specific factors are more important than macroeconomic trends.

7. DIAGNOSTIC TESTS:

Table 4: Multicollinearity Report

Independent Variable (IV)	**Variance Inflation Factor**
NII	3.8059
Fees_Income	3.2205
Trading_Income	2.6592
OI	2.9969
Ln_Size	1.3352
Loan_to_deposit_ratio	1.5270
NIM	1.7779
GDP_Growth	1.0859

Source: *Calculated through SPSS*

Variance Inflation factors have been calculated to check the multicollinearity among the Independent variables. The results indicate that multicollinearity is not a major worry, as all VIF values are less than the crucial threshold of 5. The independent variables appear to be adequately independent of one another, with the maximum VIF for NII being 3.81, which is well within the acceptable range.

Table 5: Test of Heteroskedasticity

	Value	DF	P-Value	
Likelihood ratio	444.5644	10	0.0956	

Source: *E-views output*

The panel cross-section heteroskedasticity LR test was used to evaluate the dataset's heteroskedasticity. The test yielded a 444.56 likelihood ratio and a p-value of 0.0956. Because the p-value surpasses 0.05, we cannot reject the null hypothesis of homoskedasticity, implying that heteroskedasticity across cross-sections is not a major worry.The EGLS data also demonstrate that NIM, Ln_Size, Loan-to-Deposit Ratio, RAROA, NII, and Fees Income all significantly contribute to bank stability (Z-Score), however RACAR, Trading Income, Other Income, and GDP Growth do not.

Table 6: Endogeneity Test:

Wald Test:

Test Statistic	Value	df	Probability
t-statistic	0.025975	139	0.0023
F-statistic	0.000675	(1, 139)	0.0045
Chi-square	0.000675	1	0.0011

Source: *E-views output*

Wald test for endogeneity was performed to check whether any correlation exists among the independent variables under study. A p-value of less than 0.05 was found for the t-, F-, and Chi-square statistics (0.0023, 0.0045, and 0.0011), suggesting that several regressors, including Non-Interest Income (NII), are endogenous. The System GMM estimator, which corrects for endogeneity and takes into consideration the dynamic nature of the panel data, is used in the study to overcome this issue and provide consistent and trustworthy results.

Table 7: GMM Regression Results

A) Dependent variable = Z-Score R^2=0.21 and adjusted R^2=0.59

Variables	Coefficients	P-Values
NII	80.65	0.005***
SIZE	1.07	0.031**
LDR	0.23	0.504
NIM	6.51	0.810
GDP	-1.18	0.054*

B) Dependent variable = RAROA R^2=0.27 and adjusted R^2=0.41

Variables	Coefficients	P-Values
NII	-15.02	0.562
Size	1.07	0.001***
LDR	-0.00	0.961
NIM	1.99	0.000***
GDP	0.10	0.882

C) Dependent variable = RACAR R^2=0.80 and adjusted R^2=0.72

Variables	Coefficients	P-Values
NII	-4.01	0.014
SIZE	7.20	0.006
LDR	0.05	0.725
NIM	5.54	0.027
GDP	0.09	0.738

D) Dependent variable = Z SCORE R^2=0.61 and adjusted R^2=0.49

Variables	Coefficients	P-Values
FI	-12.43550	0.8157
TI	89.59645	0.1254
OI	128.3606	0.0091
SIZE	5.069740	0.0688
LDR	0.320285	0.0396
NIM	4.798709	0.0611
GDP	-0.099779	0.7231

E) Dependent variable = RAROA R^2=0.74 and adjusted R^2=0.62

Variables	Coefficients	P-Values
FI	-14.38998	0.0090
TI	-0.583115	0.9218
OI	2.528804	0.6105
SIZE	1.335211	0.0000
LDR	-0.018572	0.2398
NIM	1.837124	0.0000
GDP	-0.022473	0.4345

F) Dependent variable = RACAR R^2=0.65 and adjusted R^2=0.58

Variables	Coefficients	P-Values
FI	-81.4781	0.1436
TI	-4.55751	0.94
OI	27.43216	0.5879
SIZE	8.902504	0.0024
LDR	0.01489	0.9262
NIM	6.404901	0.0167
GDP	0.079324	0.7866

Source:*E-views output*

8. ANALYSIS:

The results provide insight regarding association of Risk and other key explanatory variables—primarily Non-Interest Income (NII), Loan-to-Deposit Ratio (LDR), Net Interest Margin (NIM), bank size (SIZE), GDP growth, and other financial indicators—and the dependent variables Z-Score, RAROA, and RACAR, which measure bank risk and performance. The models employ the GMM which works well for dealing with possible endogeneity problems in panel data.

A) Dependent Variable = Z-Score

At the 1% level (p = 0.005***), NII shows significant and exerts a positive coefficient (80.65). It demonstrates that an increased Z-Score suggests a bank having good amount of stability. because its non-interest income is higher. SIZE, which is positively correlated with Z-Score and significant at 5% (p = 0.031**), bigger banks are more resilient to financial hardship. The GDP coefficient is negative (-1.18) and has a weak significance level (p = 0.054*), suggesting that macroeconomic development might not consistently improve bank stability in this sample. The statistical insignificance of LDR and NIM

suggests that the Z-Score in this model is not considerably impacted by lending intensity or net interest margins. which corroborates the previous works of Mercieca et. al (2007), Berger (1997), Runkle (1993), Lieven (2007) and contrasted with the studies made by edisuriya et al (2012), Duho et. al (2020)

Interpretation: Non-interest income is critical to bank stability, confirming the premise that diversifying income sources lower risk exposure.

B) Dependent Variable = RAROA

. NII has a negative but not significant connection with RAROA (-15.02, p = 0.562). This shows that non-interest revenue does not significantly improve short-term profitability as assessed by RAROA. SIZE (p = 0.001***) and NIM (p = 0.000***) have substantial and positive correlations with RAROA. This suggests that larger banks with higher net interest margins generate higher returns on assets. LDR and GDP are insignificant, indicating that lending intensity and macroeconomic growth have little direct impact on RAROA which is also supports the previous works done by stiroh (2004), Kohler (2014) and de young(2004).

Interpretation: Although NII reduces risk, it does not directly convert into short-term profitability. Bank size and operational efficiency (NIM) are the primary drivers of returns.

C) Dependent Variable = RACAR

The NII exhibits a negative coefficient (-4.01) but is statistically significant at 5% (p = 0.014), indicating an unfavorable association with capital-adjusted returns. This suggests that, while NII increases stability, it can also diminish risk-adjusted profitability due to increased volatility in fee- or trading-based income. SIZE and NIM remain positive (p = 0.006 and 0.027, respectively), indicating that bank size and interest efficiency increase RACAR. LDR and GDP are insignificant, in line with earlier predictions. NII's impact is nuanced: it improves stability while having a mixed influence on risk-adjusted performance. This result also goes in line with the studies done by Lee et al (2014), chen et al (2017) and not corroborated with kaur (2020), Dang (2020), Batten(2016). Grasa et al (2016).

Interpretation: NII's impact is nuanced: it improves stability while having a mixed influence on risk-adjusted performance.

D) Dependent Variable = Z-Score (with FI, TI, OI variables)

Other Income (OI) is the most significant income component (p = 0.0091), implying that trading and investment-related revenue contributes positively to bank stability. LDR is significant at 5% (p = 0.0396), implying that increased lending intensity somewhat boosts Z-Score. FI and TI are not significant, showing that traditional fee income and trading revenue may not have an equal impact on stability in this model. SIZE and NIM have a minor impact, consistent with the stabilizing effect of bank

scale and interest margins. This result also corroborates to the works by Ahmed (2014), Duho (2020), Isshaq et al (2019)

Interpretation: Diversified revenue, particularly OI, is more stable than typical fee or trading income alone.

E) Dependent Variable = RAROA

FI (p = 0.0090) and NIM (p = 0.0000) are extremely significant and positively impact RAROA. This suggests that fee income and operational efficiency have a major impact on profitability. SIZE is also significant (p = 0.0000), highlighting the value of scale in generating returns. TI, OI, LDR, and GDP are all insignificant, indicating that conventional trade income, other income, lending intensity, and macroeconomic growth have a small direct impact on ROA that are consistent with the studies done previously by Choi et al (2015), Arouri et al (2019), Kaur (2020), Pennathur et al (2012), Baek et al (2018) and found opposite to the studies made by Rakshit, (2022), Dang, (2020), Sharma & Anand, (2018) and Venkatesh, (2017)

Interpretation: Fee-based and interest-margin-related activities are the primary drivers of profitability.

F) Dependent Variable = RACAR

Risk adjusted returns is affected significantly by SIZE (p = 0.0024) and NIM (p = 0.0167) . The NII components (FI, TI, and OI) are mainly inconsequential, with the exception of OI, which has a positive but mild influence. LDR and GDP are both insignificant making it consistent with the works done by Gulati & Kumar, (2017), Kumar & Gulati, 2009) and sufiyan (2008).

Interpretation: Bank size and interest efficiency have the greatest influence on risk-adjusted returns, while non-interest income has little effect in this model.

Overall Observations

Non-interest income (NII) improves stability (Z-Score), but has a mixed influence on profitability (RAROA) and RACAR. Components such as Other Income (OI) and Fee Income (FI) have varying significance depending on the model. Bank Size:Consistently positive and substantial across models, implying that economies of scale boost stability and profitability. NIM exerts a positive and favorable impact on RAROA and RACAR, indicating that operational efficiency in interest-based operations is critical for success. Loan-to-Deposit Ratio (LDR) has negligible or weak relevance in these models, implying that lending intensity have no effect on bank stability and performance.GDP Growth Overall, the results are insignificant, showing that macroeconomic conditions may not have a major impact on bank-specific risk and returns over the study period.

9. POLICY IMPLICATIONS:

The study found that, while non-interest income (NII) improves bank stability, its impact on profitability and profits volatility is mixed. Regulators and policymakers should encourage the expansion of fee-based and service-driven revenue streams, which are more stable than trading activities. The RBI should impose stronger prudential standards for volatile NII components to ensure banks diversify their revenue while maintaining risk management. Consistently positive results for larger banks and those with high net interest margins emphasize the importance of consolidation, digital innovation, and increased efficiency. Similarly, transparent disclosure of service pricing is critical for consumer trust. Finally, a well-managed NII framework may improve resilience, reduce risks, and assure the long-term growth of India's public sector banks.

10. CONCLUSION:

The main thrust of this study is to investigate the relations between non-interest income (NII), bank risk, and earnings volatility in Indian public-sector banks. Banks typically receive the majority of their revenue from loan interest, but in recent years, income from other sources such as fees, trading, and services has grown in importance. These alternative revenue streams allow banks to earn more money without relying solely on lending. This study seeks to determine whether these NII sources aids a bbank towards stability, profitable, and less hazardous. The findings demonstrate that increased non-interest income helps banks become more stable. Banks that generate more revenue through fees, services, or trading are better able to withstand financial shocks and sustain capital. Other income (OI) appears to be the most beneficial of the several sources of NII, whereas fee income (FI) and trading income (TI) have mixed effects depending on the bank's size and efficiency. However, non-interest revenue does not always result in increased profitability. Bank size and net interest margin remain crucial indicators of profitability, implying that banks cannot rely primarily on NII to increase profits. When it comes to risk and earnings volatility, the study indicates that NII can lower overall risk, but specific activities, such as trading, may raise short-term variations in earnings. This means that banks must carefully manage non-interest income so that seeking to generate more does not increase their risk. Traditional measures, such as the loan-to-deposit ratio or GDP growth, exerts a lower role on stability than the own income structure of bank and management actions. To summarize, non-interest income is very beneficial in making Indian public sector banks more stable, but its impact on profits and earnings volatility is more problematic. Banks that diversify their revenue streams correctly can reduce risk and maintain financial strength. At the same time, they must ensure that speculative activity or poorly managed revenue streams do not exacerbate risk. Overall, combining traditional lending with well-managed non-interest revenue can help banks achieve consistent growth, stability, and reduce profits volatility. These insights are useful for bank managers and regulators looking to improve the financial health and long-term sustainability of the banking industry.

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Declaration of Conflicting Interests

The authors declared no conflict of interest regarding the contents of this article and its publication.