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Income Diversification and its Impact on Profitability of Banks

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Abstract: ***The paper is studying diversification in income of Indian banks and impact of income diversification on profitability and sustainability of industry, mainly in environment shift of recent financial crisis. Statistical analysis: The study is a multivariate regression analysis to find diversification score on the secondary data for Indian banking industry for sample period of 10 years, from 2008 to 2017. Score of diversifications are calculated at two stages as DS (1), DS (2) to find share of non-traditional income in total income and categorization in non-traditional income respectively. The impact on the different income categories ; Share of Non- Interest Income(SNI), Share of fee Based Income (S FI), Share of Other Income(SOT), are tested against selected control variables. F-test used to test hypothesis as direct association with two set of variables. Further criterion scores techniques (SIC), (AIC) and (HQIC) are use as model improvement to test goodness of fit of the model. The study found that income shift of new business lines helps banks to improve their profitability by dint of many barriers in implementation. The growth trend of such income is not stable during whole study period, majorly due to global financial crisis. In the library of literatures, the share of non-interest based income activities and fee based income sources has been more distinct for Private and Foreign banks, even though SBI and Its associate's banks are not far behind them. The role of the study to highlight the path for banks adopting new Non-interest income streams to enhance profitability and continuity in profitability. As reported, diversification in non-interest income sources may have positive impact on overall profitability and risk-adjusted performance along with improvement in stability of banking system. Other non-interest incomes are more changeable in compare to Fee based income generated by fee, commission and brokerage activity. By dint of many good effect of diversification banks, mainly in Indian context should take appropriate majors while diversification of its income.***

Key words: Diversification Indexes, Profitability, Bank, Profitability, Multivariate Analysis.

I. INTRODUCTION

Banks are using non trading income methods, diversification from traditional income methods, to enhance their profitability from last decades, mainly post recent financial crisis of 2008. This move of income diversification has been more visible for private and foreign banks, followed by large public sector banks.

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The banks are doing continuous innovation in their product line, moving away from their core traditional interest based income. This innovation in banking has not only been showing by use of new
technology, advanced software, but is also crucial in growthof new products and services along with development of new business models. This paper empirically analysis the effectof move in non-interest income methods on stability and profitability of Indian banks by using past data for 10 years, from 2008 to 2017. Many studies have been catering this issue, Gopinath (2011), Former deputy governor of RBI, indicated that risk in non-interest based income, mainly fee-based, carrier similar risk as the traditional interest based income, mainly lending based, and there is a need to effective supervision of the requirements of such products forman Indian perspective.Diversification has been more prominent for banks post recent financial crisis mainly in the US and Europeancountries. The study of Kaufman and Larry (1994) in advance developed economy, reported an un-even growth in the share of non-interest income in total income in the banking industry between 1982 and 1990. The literature of De Young and Rice (2001) highlights increasein share of non-interest incomefrom 0.77 % to 2.39 % in total industry assets, and 20.31 % to 42.20 % in term of operating income in the entire US banking industry, for period 1980 and 2001. Esho et al. (2004) conducted a research on Australian banking system and highlighted the diversification majors by credit unions asreduce their dependence on traditional interest income in way of three methods: (i) Bymodification in pricing policy mainly in form of transaction fees on core banking services; (ii) Change in the portfolio of assets from un-secured loans to secured mortgage loans (iii) encouragementin distribution of facility fees or commissions generating services including Insurance,MF and off-balance sheet items.The primary trade of a commercial bank isacceptance of deposits and disbursal of loans, to earn profit in form of spread between interest paid on deposits and interest received on lending. But, in the few decades, risk of doing business has increased significantly, which forces banks for diversification from traditional income methods. Banking business is no longer only restricted to income generation from lending activities. Fee-based income, revenue generated without utilization to bank's funds from other sources, is attracting more importancein income statement of banks acrossglobe.
India, most prominent emerging, has participated significantly in this shift. Sharma and Kumar (2013), Indian banks are participating in growth of India by facilitating Private Equity (PE) flow and earn fee on this services.

Umakrishnan and Bandopadhyay (2005), conducted comparative study on the income constituents for public sector , foreign banks , new generation private sector banks, and cooperative banks reported decline in share of the traditional interest income in overall income between period of 1999–2004.

International Trade in Banking Services (2010), a report by The RBI, showed branches of foreign banks operating in India had higher share of fee-based revenue in their income statement as compared to Indian banks' operating outside India. The report highlighted securities, stock, derivative, financial consultancy and foreign exchange trading services are the major sources of fee income for these banks. In India private banks are known as pioneer of this shift of income, showed higher performance rating, followed by bigger Public sector banks. The growth stories of largest private banks, ICICI and HDFC, in India is witness of this sudden shift of income stream. Kumar and Sharma (2014) , the high rating of these private banks is due to income generation ratio .Uppal (2010) ,suggested traditional interest income was continuously falling in banking operating profit for Indian banking Industry as a whole.The study has been divided into five sections, the first section contains introduction while second section provides a conceptual background in the form of review of past literature. The proposed research methodology in light of identification of problems and its solution is provided in section third. The empirical finding has been provided in section fourth, while the implications of results and direction for future research have been discussed in section fifth. The study stresses the impact of such income shift, to new income methods, on the performance, measured by profitability and improvement in stability in income, in Indian banking system for period of 10 years.

II. REVIEW OF PAST RESEARCH

The primary trade of a commercial bank is acceptance of deposits and disbursal of loans, to earn profit in form of spread between interest paid on deposits and interest received on lending. But, in the few decades, risk of doing business has increased significantly, which forces banks for diversification from traditional income methods. Banking business is no longer only restricted to generate income from fund by lending

In this perspective, a vital question being raised by many economists on the stability in Bank income, whether such income shift has contributed significantly. Davis and Tuori (2000) ,supportedincome diversification in banks by enhancement of profitability margin. Smith et al. (2003), studied the correlation of inconsistencyinnon-interest income and interest income methods for European banks between 1994–1998.This literatureconcluded as increased significance of non-interest based income for all categories of banks during study period .However, it does not establish the variability of association between interest income and non-interest income.

De Young and Rice (2003),evidencedrelatively higher non-interest income share inportfolio of large banks. Generally a managed bank has low attractionin non-interest income methods compare to relationship oriented banks. Stiroh (2004),reported adverse association of non-interest income to risk adjusted performance of banks during his study of the linkage of performance and income diversification with adjustment of risk for community banks, between 1984 - 2000. Similarly, Esho et al. (2004),focusedt the association of fee income with risk in their study spread to 198 Australian credit unions.Umakrishnan and Bandopadhyay (2005),supported non-interest based income as a sustainable income diversification option for banks in India for long run and requiredsteady innovation and skill up gradation. Stiroh and Rumble (2006),explained that profits from income diversification were superior than risk enlargeddue to non-interest activities. Such fee-based methods were unstable and not as beneficial as traditional lending activities.Vallascas et al. (2011), explaining the effect of income diversification on banks in Italy in period of the recent economy crisis, concluded that banks with high income diversificationprior to the crisis acknowledged larger decrease in performance at time of the financial crisis.Gamra and Plihon (2011),suggested banks of developing economy have high necessity to upgrade their products, services and offering, and change their income dimension into a new field of fee based earning .This research is evidence of rise in share of fee based income in net operating earnings from 28.2 % to 36.7 % between 1997 to late 2007 in emerging markets.Sahoo and Mishra (2012),conducted a study on the Indian banks, and found banks with more operational diversification evidenced higher suffering from problem of fluctuations in their financial performance. The stability in financial performance of banks did not get supported by the asset base. Trivedi (2015), conducted research to highlight comparison of diversification in source of income generated for different categories of banks .The literature concluded superiority of foreign and new private banks on public sector banks in generating a bigger share of their total income apart from traditional interest based income in India during study period of 2005-2011.

Many studies like De Young and Roland (2001), Inaba and Hattori (2007), Kumar and Sharma (2014), Arora and Kaur (2009) have been conducted on the issue of banks of different countries. Davis & Tuori, (2000), Staikouras & Wood, (2003), Busch & Kick (2009), De Young & Roland(2001); Stiroh(2004) and many more have shown the direct positive role of this income diversification on net earnings of banks. Significantly, Feldman and Schmidt (1999)studied on the constitutions of non-interest earningsin banks of US, fee based earningshave the highest share in domain of non-interest income, leads to change in regulatory and technological framework.

But very few studies have been done on performance analysis, during and Post financial crisis. While banks have identified the importance of earning from fee-based activities and thusdeclining the reliance on interest-based income, there are group of barriers in shifting to more non-interest based products and continuing them, largely for PSU banks.

Sustainability of banking system is a major concern, as risk increases with increase of fee-based income, Sub-prime crisis is the most significant example of unwanted desire of banks for earning high fee-based income. Banks face assured barriers in adopting thisdiversification in innovative business lines, using Non-interest based products may lead to un-sustainable structure.

III. RESEARCH AND METHODOLOGY

The article is based on an empirical analysis of secondary data, collected from RBI, CMIE, Ministry of finance and individual banks, on income sources from different category of all scheduled banks operating in India for the period of 10 years, 2008–2017. The data on assets, income, liability, expenditure, and different financial ratios for Indian banks for the study has been obtained from different data sources of RBI, publications from respective banks and CMIE Prowess database. There aretotal 90 banks are under schedule categories including, 43 in foreign categories, 21 in nationalised categories (Including Bhartiya Mahila Bank and IDBI bank), 20 in private bank categories and 6 in SBI-Associate category. Whole value of capital has been used instead of equity value, while calculation of Z scores due to non-availability of specific data for all banks in the group. Missing Data if any is filled with the average value of the same category. For best result and implication, research is being conducted on the whole universe of banking industry; no sampling has been done in this regard.

Diversification score has been calculated by Stiroh and Rumble (2006), diversification scores methodology. Study has been conducted to discover the role of non-interest earning activitieson stability of performance as a diversification tool, state the requirement of the two part of study (I) Diversification ratio and (II) Stability study by Risk adjust return. The key variables are being identified and used, their significance are highlighted in context of the research.Generally ratio analysis is used to judge the performance of any industry, the similar concept is also being used in banking industry from long time. Here the risk adjusted ratios are used for analysis, which provide better understanding and stability of the performance of industry. Risk-adjusted Returns on Assets (RAROA) and Risk-adjusted Returns on Equity (RAROE) , as per Stiroh & Rumble,(2006) , have been taken into account for the study .

$$RAROE = \left(\frac{\sum_{i=1}^{n=10} ROE}{n}\right) \Big/ \sigma_{ROE} \quad \text{---------- (1)}$$

$$RAROA = \left(\frac{\sum_{i=1}^{n=10} ROA}{n}\right) \Big/ \sigma_{ROA} \quad \text{---------- (2)}$$

$\frac{\sum_{i=1}^{n=10} ROE}{n}$ and $\frac{\sum_{i=1}^{n=10} ROA}{n}$ = mean of ROE and ROA for 10 years respectively, σ_{ROE} and σ_{ROA} = standard deviation, symbolizeearning per unit risk.

A otherdimension of risk-adjusted performance is, calculation of Z score,higher value of Z denote a better performance calculated by

$$z = \frac{[\overline{RAROA} + \overline{E/A}]}{\sigma_{ROA}} \text{----------(3)}$$

Where, $\overline{E/A}$ is ratio of average Equity to Asset for period of 10 years, in this study data of capital is taken as value of equity due to non-availability of specific data.

Further the multivariate regression model is used for analyzing the Impact of diversification on risk adjusted performance, based on both diversification scores DS1 and DS2 three basis empirical models are used as shown underneath known as 'Model 1', 'Model 2' and 'Model 3'in this literature.

$$X_i = \beta + \beta_1(DS1)_i + \beta_2 (S_{NI})_i + \beta_3(LASS)_i + \beta_4 (LLIA)i + \beta_5 (ROPA)_i \text{ --------(6)}$$

$$X_i = \beta + \beta_1(DS2)_i + \beta_2 (So_I)_i + \beta_3(LASS)_i + \beta_4 (LLIA)_i + \beta_5 (ROPA)i \text{ ----------(7)}$$

$$X_i = \beta + \beta_1(DS2)_i + \beta_2 (S_{FI})_i + \beta_3(LASS)_i + \beta_4 (LLIA)i + \beta_5 (ROPA)_i \text{ ------- (8)}$$

Since, we have to calculate the cause effect analysis, this concept of multivariate analysis has been used, for dependent variable(X_i), in the study.The mean value of ROE, ROA , *RAROE* , *RAROA* ,andZ Scoreover the period of 10 years , 2008-2017, for respective the*i*th bank has been measured.Refinement of methodology has been done by use of Control variables Log (Liability) [LLIB], Log (Assets) [LASS] and Ratio of operating profit to total asset [ROPA].

Further "ANNOVA F-test "has been conducted to prove null hypothesis i.e.

Ho=There is no significant relation between independent variables and dependent variables during study period of 10 years, 2008-2017.

Diversification ratio, show the level of diversification whose signification can be calculated by Score, methodology adopted by Stiroh and Rumble (2006). For better understanding, two diversification ratios have been considered in the article. The firstDiversification score (DS1) calculates the diversification in earning into non-interest based income and interest based traditional income , whereas the next Diversification score (DS2) measures thediversification in non-interest base activitiesinto fee based non-interest income and Others non-interest income. As per RBI (2010) report, Fee based income consists of income generated by "Commission, exchange and brokerage", from financial and advisory activities. 'Others Income' component of Non-interest income mainly includes "net profit (loss) on sale of investments/ land & fixed assets/revaluation of investments/exchange transaction and miscellaneous income" by,

$$DS_1 = 1 - (S_{NI}^2 + S_I^2) \text{ ----------(9)}$$

$$DS_2 = 1 - (S_{FI}^2 + S_{OI}^2) \text{ ----------(10)}$$

Where,
S_I= Share of interest income in total income
S_{NI}= Share of non-interest income or other income in total income
S_{FI} = Share of 'fee-income' in non-interest income
S_{OI}= Share of 'other components' *in* non-interest income
DS1, a higher valuesays a larger diversification and score valueto zero shows no diversification, means all income of bank is either from Non-interest income or Interest based income, while a score of 0.5 results complete diversification. Similar calculation of DS2,a score value of zero states all non-interest income of a bank is either from other income sources or fee sources, whereas avalue of 0.5 outcomes into total diversification.
Both DS1 and DS2 have been calculated for study period of 10 years, 2008-2017and averaged over for each category, unlike previous researches, for omission of time error.

Further Goodness of Fit of statistical model has been done by studying information criterion scores of Akaka Information criterion (AIC), Schwarz Information criterion (SIC), and Hannan–Quinn Information criterion (HQIC). These Information criterion values are used to show the goodness of statistical model used in study, mainly for time series model. The close numerical value of these three shows fitness of model.

IV. CALCULATION AND FINDING

The piece of study uses the portion of earning generated from non-interest based and traditional interest based activities for banks during 2008-201 in India. As Table 1, has been compiled to get the percentage of non-interest based earning as percentage of total earning in banks, grouped in different categories. The average shift in income trend is 14.72% for the whole industry, dominated by banks of foreign bank category followed by private banks, while nationalized banks, except SBI and its Associates are behind the industry average. Table 2, compiled to get the percentage of non-interest income to interest income in different groups of banks. The average shift in income trend is 17.34 % during period of 10 years, 2006-2015, for the whole industry, dominated by banks of foreign bank category followed by private banks, while nationalized, except SBI and its Associates are below the industry average. A common pattern in growth can been observed in all categories of bank, percentage of No-Interest Income increased from 2006 to 2009 and fell from 2009 to 2015. The economic explanation of such pattern could be after effect of the global financial crisis for need of stability into financial, mainly the banking sector.It first calculation present a relative study of earning generated from non-interest based and traditional interest based activities for banks of different categories. By use of diversification scores, DS1 and DS2, study the diversification in income group and uses Z scores for comparative study of the risk-adjusted performance in bank groups. Further multifactor regression model has been used to analyze the effect of diversification in banks' income portfolio and growing portion of non-interest income on risk-adjusted performance in Indian banks

Table 1: Percentage Of Non-Interest Income In Total Income

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Mean
ALL SCHEDULED COMMERCIAL BANKS	18.10	16.02	15.67	16.37	16.22	16.03	13.98	11.64	11.35	11.78	14.72
SBI & ITS ASSOCIATES BANKS	17.71	16.19	14.98	14.37	15.27	15.81	14.91	11.04	10.76	10.98	14.20
NATIONALISED BANKS	16.16	12.26	11.41	12.82	12.55	12.79	10.08	8.72	8.65	8.87	11.43
PRIVATE SECTOR BANKS	19.51	18.68	19.90	19.33	17.35	19.78	17.75	15.69	15.18	15.81	17.90
FOREIGN BANKS	29.65	30.41	28.21	30.25	32.94	27.38	27.87	23.24	21.00	22.78	27.37

Source: Data base of India Economy (DBIE) of RBI

Table 2: Percentage of Non-interest income to traditional Interest income

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Mean
ALL SCHEDULED COMMERCIAL BANKS	22.1	19.08	18.58	19.58	19.36	19.09	16.25	13.18	12.81	13.35	17.34

SBI & ITS ASSOCIATES BANKS	21.52	19.32	17.62	16.78	18.02	18.78	17.52	12.42	12.06	12.33	16.64
NATIONALISED BANKS	19.28	13.98	12.88	14.71	14.35	14.66	11.21	9.55	9.46	9.73	12.98
PRIVATE SECTOR BANKS	24.24	22.97	24.84	23.96	20.99	24.66	21.58	18.62	17.89	18.77	21.85
FOREIGN BANKS	42.15	43.7	39.3	43.36	49.12	37.71	38.65	30.27	26.58	29.49	38.03

Source: Data base of India Economy (DBIE) of RBI

A common pattern in growth can been observed in all categories of bank, percentage of No-Interest Income increased from 2006 to 2009 and fell from 2009 to 2015. The economic explanation of such pattern could be after effect of The global financial crisis for need of stability into financial, mainly the banking sector.

It first calculation present a relativestudy of earning generated from non-interest based and traditional interest based activities for banks of different categories. By use of diversificationscores, DS_1 and DS_2, study the diversification in income group and uses Z scores for comparative study of the risk-adjusted performance in bank groups. Further multifactor regression model has been used to analyze the effect of diversification in banks' income portfolio andgrowingportion of non-interest income on risk-adjusted performance in Indian banks.

Diversification of Total Income and Non-Interest Income

DS1 has been calculated to find the diversification score of total income in the sample bank for study period of 10 years. Table 3 clearly shows diversification scores, DS1, varies from 0.23 for nationalised bank to 0.55 for foreign banks, while all scheduled banks together have score 0.29. The average interest income (S_I) is highest for SBI and its associates followed by nationalized banks in that category for study period. Foreign banks are least in the list with 72.63 as mean, while they lead from front in case of Non-Interest Income (S_{NI}) with 27.37, followed by private sector banks with 17.90, larger than the mean, 14.72, forwhole universe of schedule banks together during study period.

DS_2 has been calculated to find the diversification score in non-interest based income in banks, Non-interest income has been divided into fee and other income category for further study. The impact has been analysed and presented in Table 4.

The mean diversification score of all scheduled banks is 0.49 .i.e. very close to 0.5, shows a complete diversification of income in Indian banks, whereas the mean value of DS_2 for Foreign, Private and Nationalised banks 0.61, 0.82 and 0.99 respectively indicates the concentration of income towards one source. The share of Fee- based (S_{FI}) and other income (S_{OI}) indicate the level of concentration in these banks. The income of Foreign and Private Banks are mainly from fee based activities while incomes of nationalised banks are result of other income.SBI and its associates shows an increasing trend in non-interest income from year 2006 to 2015 , while there is a fall reported in last few years, but still have the largest share of fee based income in all category of banks. The share of non- traditional income of other banks follow the same pattern like SBI and Its associates banks, recent financial crisis could be the main reason for such negative shift in last few years , which may have forced banks to return to their basic business

Table 3: Share of Non-interest, Interest income and Diversification score as per Eq.(7)

		2008	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*	*Mean*
ALL SCHEDULED COMMERCIAL BANKS	S_I	*81.90*	*83.98*	*84.33*	*83.63*	*83.78*	*83.97*	*86.02*	*88.36*	*88.65*	*88.22*	*85.28*
	S_{NI}	*18.10*	*16.02*	*15.67*	*16.37*	*16.22*	*16.03*	*13.98*	*11.64*	*11.35*	*11.78*	*14.72*
	DS1	*0.36*	*0.32*	*0.31*	*0.33*	*0.32*	*0.32*	*0.28*	*0.23*	*0.23*	*0.24*	*0.29*
SBI & ITS ASSOCIATES BANKS	S_I	*82.29*	*83.81*	*85.02*	*85.63*	*84.73*	*84.19*	*85.09*	*88.96*	*89.24*	*89.02*	*85.80*
	S_{NI}	*17.71*	*16.19*	*14.98*	*14.37*	*15.27*	*15.81*	*14.91*	*11.04*	*10.76*	*10.98*	*14.20*
	DS1	*0.35*	*0.32*	*0.30*	*0.29*	*0.31*	*0.32*	*0.30*	*0.22*	*0.22*	*0.22*	*0.28*

NATIONALISED BANKS	S_I	83.84	87.74	88.59	87.18	87.45	87.21	89.92	91.28	91.35	91.13	88.57
	S_{NI}	16.16	12.26	11.41	12.82	12.55	12.79	10.08	8.72	8.65	8.87	11.43
	DS1	0.32	0.25	0.23	0.26	0.25	0.26	0.20	0.17	0.17	0.18	0.23
PRIVATE SECTOR BANKS	S_I	80.49	81.32	80.10	80.67	82.65	80.22	82.25	84.31	84.82	84.19	82.10
	S_{NI}	19.51	18.68	19.90	19.33	17.35	19.78	17.75	15.69	15.18	15.81	17.90
	DS1	0.39	0.37	0.40	0.39	0.35	0.40	0.36	0.31	0.30	0.32	0.36
FOREIGN BANKS	S_I	70.35	69.59	71.79	69.75	67.06	72.62	72.13	76.76	79.00	77.22	72.63
	S_{NI}	29.65	30.41	28.21	30.25	32.94	27.38	27.87	23.24	21.00	22.78	27.37
	DS1	0.59	0.61	0.56	0.60	0.66	0.55	0.56	0.46	0.42	0.46	0.55

Source: Compiled by researcher

Table 4: Share of Other Income, Fee based income and Diversification score as per Eq. (8)

		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Mean
ALL SCHEDULED COMMERCIAL BANKS	S_{OI}	57.03	47.29	43.38	49.11	50.93	47.83	40.09	38.90	43.84	47.81	46.62
	S_{FI}	42.97	52.71	56.62	50.89	49.07	52.17	59.91	61.10	56.16	52.19	53.38
	DS2	0.49	0.50	0.49	0.50	0.50	0.50	0.48	0.48	0.49	0.50	0.49
SBI & ITS ASSOCIATES BANKS	S_{OI}	49.44	44.25	29.29	32.93	39.41	34.80	26.30	17.13	28.52	32.37	33.44
	S_{FI}	50.56	55.75	70.71	67.07	60.59	65.20	73.70	82.87	71.48	67.63	66.56
	DS2	0.50	0.49	0.41	0.44	0.48	0.45	0.39	0.28	0.41	0.44	0.43
NATIONALISED BANKS	S_{OI}	11.53	7.49	6.71	8.62	8.41	8.43	5.85	5.13	5.30	5.71	7.32
	S_{FI}	4.63	4.77	4.70	4.20	4.14	4.35	4.23	3.58	3.35	3.15	4.11
	DS2	0.98	0.99	0.99	0.99	0.99	0.99	0.99	1.00	1.00	1.00	0.99
PRIVATE SECTOR BANKS	S_{OI}	8.39	5.66	7.15	7.30	5.79	7.76	4.82	4.58	4.88	5.69	6.20
	S_{FI}	11.12	13.02	12.74	12.02	11.56	12.02	12.94	11.11	10.30	10.11	11.70
	DS2	0.81	0.80	0.79	0.80	0.83	0.80	0.81	0.86	0.87	0.87	0.82
FOREIGN BANKS	S_{OI}	13.13	14.15	12.39	14.94	18.41	9.32	11.66	8.62	9.34	11.97	12.39
	S_{FI}	16.52	16.26	15.82	15.30	14.53	18.06	16.21	14.62	11.66	10.81	14.98
	DS2	0.55	0.54	0.60	0.54	0.45	0.59	0.60	0.71	0.78	0.74	0.61

Source: Compiled by researcher

SBI and its associates shows an increasing trend in non-interest income from year 2006 to 2015 , while there is a fall reported in last few years, but still have the largest share of fee based income in all category of banks. The share of non-traditional income of other banks follow the same pattern like SBI and Its associates banks, recent financial crisis could be the main reason for such negative shift in last few years , which may have forced banks to return to their basic business.

Diversification on Risk-adjusted Performance

The mean value of key dependent variables used in the literature during period 2006–2015,for all category of banks, are shown in Table 5. There is hugevariation in performance as well as risk-adjusted performance. ROA is highest for foreign category of banks, average to 1.83, followed by private category banks the averages around 1.29. While ROE is highest for SBI groups followed by their nationalized peer banks, while foreign banks are on the last step in this category. Hence, all risk-adjusted key performance measures (RAROA, RAROE and Z score) demonstratemajorinconsistency.

Table 5: Risk Adjusted Performance and Z score as per Eq. (1),(2) and (3)

		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Mean	RAROE	RAROA	z score

	ROA	1.01	1.01	1.05	1.12	1.13	1.05	1.1	1.08	1.04	0.81	1.04	9.57	11.53	4.26
All SCBs	ROE	15.75	14.77	15.51	15.98	15.44	14.31	14.96	14.6	13.84	10.68	14.58			
State Bank of India & its Associates	ROA	0.95	0.87	0.86	0.97	1.02	0.91	0.79	0.89	0.93	0.63	0.88	6.56	8.02	5.86
	ROE	18.76	16.92	16.31	17.21	17.74	15.92	14.11	16	15.29	10.03	15.83			
Nationalized Banks	ROA	0.95	0.89	0.94	1.01	1.03	1	1.03	0.88	0.74	0.45	0.89	4.71	5.02	3.74
	ROE	16.47	14.65	15.97	17.09	18.05	18.3	18.19	15.05	12.34	7.76	15.39			
Private Sector Banks	ROA	1.06	1.07	1.02	1.13	1.13	1.28	1.43	1.53	1.63	1.65	1.29	8.32	5.22	3.82
	ROE	13.27	13.34	13.71	13.43	11.38	11.94	13.7	15.25	16.46	16.22	13.87			
Foreign Banks	ROA	1.61	2.08	2.28	2.09	1.99	1.26	1.75	1.76	1.92	1.57	1.83	4.17	6.06	4.47
	ROE	11.72	14.18	15.98	16.05	13.75	7.34	10.28	10.79	11.53	9.02	12.06			

Source: Compiled by researcher

SBI and its Associates are leading from front in RAROA and Z-score parameters, while Private category banks are on top for RAROE category. Average value of risk adjusted key variables is 9.57, 11.53 and 4.26 for RAROE, RAROA and Z-score respectively for Indian Schedule banks.

The detail of key controlled variables isrevealed in Table 6, Ratio of operating profit to asset (ROPA) is highest in foreign category banks followed by private banks. Nationalised banks stand last in this category with 1.90, in study period, while average ROPA for all schedule banks are averaged to 2.19.

Table 6: Control variables

		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Mean
All SCBs	ROPA	2.36	2.12	2.11	2.15	2.32	2.17	2.26	2.24	2.13	2.04	2.19
	LASS	7.37	6.12	7.54	6.48	6.44	6.53	6.63	6.52	6.51	5.88	6.60
	LLIB	5.41	5.40	5.47	5.60	5.64	5.69	5.77	5.80	5.85	5.88	5.65
State Bank of India & its Associates	ROPA	2.60	2.28	1.91	1.92	2.04	1.84	2.19	2.36	2.07	1.85	2.11
	LASS	6.80	6.84	6.91	7.00	7.11	7.15	7.20	7.25	7.32	7.37	7.09
	LLIB	4.02	4.02	4.02	4.19	4.03	4.04	4.04	4.06	4.07	4.12	4.06
Nationalized Banks	ROPA	2.27	1.86	1.92	1.80	1.92	1.89	1.99	1.92	1.79	1.65	1.90
	LASS	7.06	7.12	5.08	7.30	7.40	7.48	7.57	7.63	7.69	7.75	7.21
	LLIB	5.16	5.05	5.06	5.06	5.10	5.09	5.25	5.23	5.25	5.25	5.15
Private Sector Banks	ROPA	1.93	1.95	2.08	2.28	2.46	2.68	2.58	2.51	2.64	2.79	2.39
	LASS	6.63	6.76	6.87	6.97	7.01	7.06	7.15	7.23	7.30	7.35	7.03
	LLIB	4.53	4.60	4.62	4.66	4.63	4.66	4.68	4.68	4.70	4.71	4.65
Foreign Banks	ROPA	3.16	3.77	4.06	4.40	4.97	3.70	3.52	3.44	3.33	3.30	3.77
	LASS	6.19	6.30	6.44	6.56	6.65	6.64	6.69	6.77	6.80	6.87	6.59
	LLIB	4.85	4.95	5.11	5.35	5.41	5.48	5.55	5.61	5.67	5.71	5.37

Source: data base of India Economy (DBIE) of RBI and Respective Banks

In Log of Assets (LASS) category nationalised banks are on top with mean of 7.21, followed by SBI groups with average of 7.09. Foreign Bank are on the bottom in the category with mean of 6.59 for 10 years, 2006-2015.In Log of Liability (LLIB), a reverse trend has been observed, Foreign Banks are leading with an average of 5.37. The average value to LLIB for all schedule banks reaches to 5.65.

Theeffect of the income diversification and rising share of non-interest based activities in total income study by equation (4), (5) and (6).The outcome of Hypothesis testing, by method of ANOVAs F –test, has been shown in table 7 , for all three empirical equation with name Model 1 , Model 2 and Model 3.

The calculated values of F are rejected on the different significant level from critical value of F , leads to rejection of Null hypothesis H_0, Proves the significance relation between dependent ,i.e , Performance variables and independent variables when control variables are addedduring study period of 10 years, 2008-2017. Value of R-square is between 0-1, show the goodness of fit to Model for the test , Improvement in the model is done by use of study information criterion scores of Akaika Information criterion (AIC) , Schwarz Information criterion (SIC) , and Hannan–Quinn Information criterion (HQIC). The result of these criterion shows in Table 8,

Table 7: F-test Table

Variable	*R-squared*	*F-statistic*
	MODEL 1	
ROE	*0.745*	*2.331*
ROA	*0.577*	*1.092*
RAROE	*0.799*	*3.177*
RAROA	*0.438*	*0.623*
Z-score	*0.862*	*4.989*
	MODEL 2	
ROE	*0.823*	*3.711*
ROA	*0.780*	*2.836*
RAROE	*0.797*	*3.136*
RAROA	*0.232*	*0.242*
Z-score	*0.944*	*4.489*
	MODEL 3	
ROE	*0.823*	*3.711*
ROA	*0.780*	*2.836*
RAROE	*0.797*	*3.136*
RAROA	*0.232*	*0.242*
Z-score	*0.944*	*4.589*

Table 8: Information criterion scores for SCI, AIC, HQIC

Variable	*AIC*	*SIC*	*HQIC*
	MODEL 1		
ROE	*3.412*	*3.593*	*3.212*
ROA	*-1.740*	*-1.558*	*-1.939*
RAROE	*4.748*	*4.929*	*4.548*
RAROA	*3.752*	*3.933*	*3.553*
Z-score	*4.171*	*4.353*	*3.972*
	MODEL 2		
ROE	*3.047*	*3.228*	*2.847*
ROA	*-2.393*	*-2.212*	*-2.592*
RAROE	*4.758*	*4.940*	*4.559*
RAROA	*4.063*	*4.244*	*3.864*
Z-score	*3.267*	*3.449*	*3.068*
	MODEL 3		
ROE	*3.047*	*3.228*	*2.847*
ROA	*-2.393*	*-2.212*	*-2.592*
RAROE	*4.758*	*4.940*	*4.559*

RAROA	*4.063*	*4.244*	*3.864*
Z-score	*3.267*	*3.449*	*3.068*

The values of all these three criterions are very close to each other and follow the same direction , either –Ve or +Ve , shows the most fit of statistical model implemented for study

Table 9: Result for Multiple Regressions

MODEL 1				*MODEL 2*				*MODEL 3*			
Variable	*Coefficient*	*Std. Error*	*t-Stat*	*Variable*	*Coefficient*	*Std. Error*	*t-Stat*	*Variable*	*Coefficient*	*Std. Error*	*t-Stat*
				Dependent variable ROE							
Const.	*-8.767*	*36.143*	*-0.24*	*Const.*	*-30.895*	*51.05*	*-0.61*	*Const.*	*-54.6*	*59.5*	*-0.92*
DS1	*591.3*	*516.45*	*1.145*	*DS2*	*105.93*	*79.43*	*1.334*	*DS2*	*105.9*	*79.4*	*1.334*
S_{NI}	*-8.474*	*7.476*	*-1.13*	S_{OI}	*-0.237*	*0.124*	*-1.9*	S_{FI}	*0.237*	*0.12*	*1.904*
LASS	*0.816*	*0.97*	*0.842*	*LASS*	*0.831*	*0.901*	*0.922*	*LASS*	*0.831*	*0.9*	*0.922*
LLIB	*-3.855*	*4.805*	*-0.8*	*LLIB*	*-5.042*	*2.556*	*-1.97*	*LLIB*	*-5.04*	*2.56*	*-1.97*
ROPA	*7.595*	*5.097*	*1.49*	*ROPA*	*12.492*	*5.179*	*2.412*	*ROPA*	*12.49*	*5.18*	*2.412*
				Dependent variable ROA							
Const.	*-2.702*	*2.75*	*-0.98*	*Const.*	*-5.511*	*3.364*	*-1.64*	*Const.*	*-7.87*	*3.92*	*-2.01*
DS1	*60.2*	*39.301*	*1.532*	*DS2*	*11.382*	*5.234*	*2.175*	*DS2*	*11.38*	*5.23*	*2.175*
S_{NI}	*-0.863*	*0.569*	*-1.52*	S_{OI}	*-0.024*	*0.008*	*-2.88*	S_{FI}	*0.024*	*0.01*	*2.881*
LASS	*0.036*	*0.074*	*0.49*	*LASS*	*0.044*	*0.059*	*0.747*	*LASS*	*0.044*	*0.06*	*0.747*
LLIB	*-0.029*	*0.366*	*-0.08*	*LLIB*	*-0.119*	*0.168*	*-0.71*	*LLIB*	*-0.12*	*0.17*	*-0.71*
ROPA	*0.604*	*0.388*	*1.557*	*ROPA*	*1.108*	*0.341*	*3.246*	*ROPA*	*1.108*	*0.34*	*3.246*
				Dependent variable Z score							
Const.	*28.776*	*52.837*	*0.545*	*Const.*	*132.47*	*57.01*	*2.323*	*Const.*	*181*	*66.5*	*2.722*
DS1	*-1209.6*	*754.99*	*-1.6*	*DS2*	*-317.97*	*88.71*	*-3.58*	*DS2*	*-318*	*88.7*	*-3.58*
S_{NI}	*17.052*	*10.93*	*1.56*	S_{OI}	*0.485*	*0.139*	*3.493*	S_{FI}	*-0.49*	*0.14*	*-3.49*
LASS	*0.057*	*1.418*	*0.041*	*LASS*	*-0.698*	*1.006*	*-0.69*	*LASS*	*-0.7*	*1.01*	*-0.69*
LLIB	*-3.95*	*7.024*	*-0.56*	*LLIB*	*-1.192*	*2.854*	*-0.42*	*LLIB*	*-1.19*	*2.85*	*-0.42*
ROPA	*23.136*	*7.451*	*3.105*	*ROPA*	*8.636*	*5.784*	*1.493*	*ROPA*	*8.636*	*5.78*	*1.493*
				Dependent variable RAROA							
Const.	*-46.86*	*42.845*	*-1.09*	*Const.*	*-55.294*	*84.86*	*-0.65*	*Const.*	*-59.5*	*99*	*-0.6*
DS1	*-46.621*	*612.21*	*-0.08*	*DS2*	*68.161*	*132.1*	*0.516*	*DS2*	*68.16*	*132*	*0.516*
S_{NI}	*1.269*	*8.863*	*0.143*	S_{OI}	*-0.042*	*0.207*	*-0.21*	S_{FI}	*0.042*	*0.21*	*0.205*
LASS	*0.265*	*1.15*	*0.231*	*LASS*	*0.473*	*1.498*	*0.316*	*LASS*	*0.473*	*1.5*	*0.316*
LLIB	*6.97*	*5.696*	*1.224*	*LLIB*	*1.398*	*4.248*	*0.329*	*LLIB*	*1.398*	*4.25*	*0.329*
ROPA	*0.913*	*6.042*	*0.151*	*ROPA*	*7.292*	*8.609*	*0.847*	*ROPA*	*7.292*	*8.61*	*0.847*
				Dependent variable RAROE							
Const.	*95.396*	*70.492*	*1.353*	*Const.*	*76.017*	*120.1*	*0.633*	*Const.*	*34.74*	*140*	*0.248*
DS1	*1328.64*	*1007.2*	*1.319*	*DS2*	*88.409*	*186.9*	*0.473*	*DS2*	*88.41*	*187*	*0.473*
S_{NI}	*-20.058*	*14.582*	*-1.38*	S_{OI}	*-0.413*	*0.293*	*-1.41*	S_{FI}	*0.413*	*0.29*	*1.41*
LASS	*2.415*	*1.892*	*1.276*	*LASS*	*1.978*	*2.121*	*0.933*	*LASS*	*1.978*	*2.12*	*0.933*
LLIB	*-21.354*	*9.371*	*-2.28*	*LLIB*	*-14.694*	*6.014*	*-2.44*	*LLIB*	*-14.7*	*6.01*	*-2.44*
ROPA	*-9.864*	*9.94*	*-0.99*	*ROPA*	*-11.099*	*12.18*	*-0.91*	*ROPA*	*-11.1*	*12.2*	*-0.91*

Note: data on 1% rejection level

The direction of impact among all variables used in this studyis beengiven in table 10. The data inferences level of tolerance; the dependent variable ROE is positively impacted by diversification measures, income have negative effect on predictor variable.

The impact on ROA follow the same trend as ROE during the study period .Diversification measure DS1 shows negative impact on risk adjusted variable RAROA and Z-score.

Table 10: Impact Direction of Variables

Variable	*ROE*	*ROA*	*RAROE*	*RAROA*	*Z-score*
DS_1	*+ve'*	*+ve'*	*+ve'*	*-ve'*	*-ve'*
DS_2	*+ve'*	*+ve'*	*+ve'*	*+ve'*	*-ve'*
S_{NI}	*-ve'*	*-ve'*	*-ve'*	*+ve'*	*+ve'*
S_{OI}	*-ve'*	*-ve'*	*-ve'*	*-ve'*	*+ve'*
S_{FI}	*+ve'*	*+ve'*	*+ve'*	*+ve'*	*-ve'*
LASS	*+ve'*	*+ve'*	*+ve'*	*+ve'*	*-ve'*
LLIB	*-ve'*	*-ve'*	*+ve'*	*+ve'*	*-ve'*
ROPA	*+ve'*	*+ve'*	*+ve'*	*+ve'*	*+ve'*

Conclusion and Direction for Future research

The study questions how the income based diversification has been affecting profitability and stability of Indian banks in income context. The study has been conducted in two distinct ways; first, to calculate the role of non-interest income as diversification in income portfolio. The main motive behind this is to find one of the major components of income in banking sector in current time, in form of either fee-based income or other innovative income streams. This is in line with finding of various past studies conducted for Indian as well as global banks, which focused on non-interest based andtraditional interest based income diversification strategies separately.

Second, as the outcome of statistics demonstrate a positive effect of such income diversification on overallprofit along with direction of this impact. Risk adjusted measures have been introduced to clear understanding of stability of sources of Non- interest incomes for future.

The article analyses the role of non-interest income and new business lines on profitability and continuity of profit for Indian banks in period of 10 years, 2008-2017. It is very much apparent that such income shift of new business lines helps banks to improve their profitability by dint of many barriers in implementation. The growth trend of such income is not stable during whole study period, major impact of global financial crisis although Indian banks are least impacted in comparison to their global peer groups. In the library of literatures, the share of non-interest based income activities and fee based income sources has been more distinct for Private and Foreign banks, even though SBI and Its associate's banks are not far behind them. The role of the study to highlight the path for banks adopting new Non-interest income streams to enhance profitability and continuity in profitability. As discussed above, diversification in non-interest income sources may have positive impact on overall profitability and risk-adjusted performance along with improvement in stability of banking system. Other non-interest incomes are more changeablein compare to Fee based income generated by fee, commission and brokerage activity. By dint of many good effect of diversification banks, mainly in Indian context should take appropriate majors while diversification of its income.

The current literature highlighted the impact of income diversification on profitability for different groups of Indian banking system, and has not calculated such impact on each bank .This could be a major task to be accomplished in future. Further, income from Fee, commission and brokerage has been taken into single account in Fee based Income category, each can be studied each as an individual impact factor in future research. This will help in finding impact of each components of fee-income on profitability of banks for better decision making.

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