CHAPTER :- 4

ANALYTICAL STUDY OF NON INTEREST INCOME OF PUBLIC BANKS BEFORE DEMONETIZATION AND AFTER DEMONETIZATION IMPACT

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4.1 Introduction

Driven by financial reforms, technical developments, and policy-level interventions, the Indian banking sector has seen transformation changes over the last ten years. One such major and disruptive policy event was the demonetization exercise announced by the Government of India on November 8, 2016, wherein ₹500 and ₹1000 currency notes ceased to be legal tender. Beyond affecting cash-dependent businesses, this decision also transformed the financial and functional activities of banks, especially PSBs, which own a major share in India's formal banking sector.

The main sources of income for banks have traditionally y been fund-based, i. e. interest on loans and advances. But with shifting economic dynamics, growing competition, and regulatory demands on asset quality and interest spreads, banks have begun stressing the need of Non-Fund Based Income (NFBI), sometimes known as non-Int. Income. Revenues generated from fees, commissions, processing costs, foreign exchange transactions, account services, and digital transaction assistance are included. Post-demonetization, the rise in digital payments and decrease in cash handling brought fresh attention to these other income sources.

With a particular emphasis on how demonetization impacted the production, share, and patterns of non-Int. Income in public sector banks, this analytical study explores the structural change in the makeup of bank revenue. Performance over a ten-year period from 2011–12 to 2020–21 is evaluated using several financial ratios, including the ratio of non-Int. Income to overall income, owner's fund, investment, and long-term capital. This schedule Allows a comparative, time-series study of income trends both before and following demonetization.

The study uses statistical techniques like Two-Way ANOVA and Paired t-tests as well to assess the importance of the noted differences in NFBI across years and banks. The analytical lens helps to assess PSBs' adaptability to external policy shocks, their preparedness to utilize digital services, and their income diversification efforts. Isolating non-fund income performance provides insights on banks' resiliency, operational restructuring, and the function of fee-based services in assuring long-term profitability.

Furthermore, this chapter clarifies how non-lending income sources have been reinforced by PSBs to transform their business models in response to issue including weakening credit demand, pressure on net interest margins, and rising NPAs. For legislators, bank strategists, and regulators wanting to improve the financial sustainability of public banks via diversified revenue sources, the results have significant implications.

This chapter connects a historic economic event—demonetization—with micro-level financial performance measures in PSBs, therefore adding to the bigger debate on banking changes. The thorough study of NFBI highlights its rising importance in a banking context becoming more service-driven and digital.

4.2 Unique Characteristics Of NII

Non-Int. Income (NII), sometimes referred to as Non-Fund Based Income, is the money made by banks from means other than interest gained on loans and advances. It is vital for diversifying sources of income and boosting financial stability. Non-interest revenue is distinguished from conventional interest-based profits by these special characteristics:

- Transaction-Oriented and Fee-Based

Non-Int. Income comes mostly from service fees, commissions, processing fees, and transaction services like ATM usage, NEFT, RTGS, and UPI transfers. Unlike Int. Income, it is not tied to credit risk or lending activity.

- Less Risk Weighted

NII's lack of loan disbursement makes it comparatively less susceptible to asset quality issue and credit risk. Particularly in times of economic downturn or increasing NPAs, this turns it a reliable source of income.

- Connected to Operational Efficiency

A bank's ability to offer services like wealth management, foreign exchange trading, insurance distribution (assurance), and investment advice is very dependent on the NII's generation. Better technology and service delivery help to raise NII.

- More Responsive to Customer Interaction

NII relies much on customer behavior and interaction with transaction platforms, value-added services, and digital banking channels. Income from service fees and commissions rises with growing customer use.

- Reacting to Policy and Legislative Changes

NII is much affected by government policies including demonetization, GST implementation, or digital banking efforts. Post-demonetization, for instance, digital transaction charges became a major source of NII.

- Helps to diversify income.

NII helps banks balance the volatility of Int. Income and lower their reliance on conventional loans. Particularly when credit growth slows or interest margins compress, it offers a regular source of income.

- Revenue Possibility in the Near Term

Unlike Int. Income, which accumulates with time, non-Int. Income usually comes from short-term actions (ex. charges on services, one-time commissions), providing immediate revenue realization.

- Growth fueled by technology:

Banks must adhere to regulatory standards (ex. RBI rules) pertaining to disclosure, restrictions on service charges, and fair methods for generating NII, hence making this income stream more organized and open.

4.3 Reasons For NII

- Diversification of Revenue Streams

- To lessen their reliance on conventional Int. Income, banks increasingly turn to non-Int. Income.
- Diversification reduces credit cycle-related risk as well as that brought on by interest rate swings.

- Particularly in volatile economic times, a well balanced income plan helps to guarantee financial stability.
- decreasing net interest margins (NIMs)
- Banks frequently see reduced margins on loans and deposits as a result of fierce competition, regulatory limits, and fluctuating financial policies.
- By offering steady income from fees, charges, commissions, non-Int. Income offsets this compression.
- Development of Digital Financial Transactions
- Post-demonetization, the rise in digital transactions (UPI, NEFT, RTGS, IMPS) provided fresh income via service and convenience charges.
- Banks used transaction volumes to make money on products including mobile banking, online fund transfers, and card usage.
- Cross-Selling of Financial Products
- Banks increasingly work as financial supermarkets, providing life insurance, mutual funds, retirement plans, etc.
- These products are quite appealing for revenue creation since they produce income depending on commissions without any credit or lending risk.
- Fee-Based Financial Services
- Fee income comes from locker rentals, SMS alerts, check clearance, ATM fees, and account maintenance as well as processing fees and documentation fees.
- Less unstable, these constant payments guarantee a consistent income flow.
- Treasury and FX Operations
- Banks deal in derivatives, stocks, bonds, and government securities.
- Furthermore, income from spreads and conversion margins comes from foreign exchange transactions with companies and individuals.
- Regulatory and Policy Impact
- Financial inclusion programs, demonetization, and digital India initiatives All push banks toward creating other income streams.
- RBI rules on keeping Capital Adequacy Ratio (CAR) also motivate banks to grow sources of non-risk income.
- Low Credit Offtake During Particular Times

- Lending activity may decline during economic downturns or modest credit growth.
- Non-Int. Income is especially important to keep profitability in such situations.

➢ Automatic and technical invention

- Investments in Fin Tech solutions let banks automate services and provide premium and quicker ones (such as instant loan processing and wealth advisory) for a fee.
- Through convenience fees, automation raises income and lowers operating expenses.

➢ Enhanced Custom Segmentation and Revenue Generation

- To provide customized services for particular segments (ex. priority banking, investment advice), banks study customer behavior.
- This generates value-added fee-based services that boost client retention and profitability.

➢ Advantage in Regulation and Reputation

- A healthy balance of non-Int. Income points to solid financial planning.
- It increases investor confidence and helps to support higher credit ratings by improving Return on Equity (ROE) and ROA (ROA).

➢ Policies Reforming Encouragement

- Programs like JAM (Jan Dhan–Aadhaar–Mobile) and DBT (Direct Benefit Transfer) have broadened the consumer base and thereby enhanced the possibilities for income related to services.
- Government initiatives have gently pushed PSBs to generate money from services.

4.4 NII Influences Commercial Banking Performance

Non-Int. Income (NII) has come to be a major predictor of total commercial bank success in the changing banking industry scene. Banks have historically depended mostly on Int. Income from loans and advances. But banks—particularly in underdeveloped nations like India—have been driven to diversify their income sources by growing rivalry, regulatory limits, and fluctuating interest rate

environments. Because it is less volatile and somewhat risk-free, non-Int. Income helps to transform a bank's profitability, efficiency, and resiliency.

1. Improvement of Profitability

Non-interest revenue straight improves a bank's bottom line without the related credit risk of lending operations.

Fees, commissions, foreign exchange transactions, and service charges are usuallystable and consistent sources that offer a predictable revenue stream.

Compared to banks that rely only on Int. Income, those with a greater share of NII show better ROA (ROA) and Return on Equity (ROE).

2. Improved operational effectiveness

Lower marginal costs of technology-driven services like internet banking, mobile banking, and ATM services are frequently source of NII.

The cost-to-income ratio improves noticeably as digital services grow, which results in better operational efficiency and reduced overheads.

Fewer human resources are needed for fee-based services, which are more easily automated, so lowering costs and simplifying operations.

3. Risk Spread

Because it depends on interest rate swings and loan defaults, Int. Income is unstable.

Particularly in times of economic downturn or increasing non-performing assets (NPAs), non-Int. Income cushions against credit risk.

It guarantees financial stability and guarantees ongoing revenue generation even with a slowdown in credit growth.

4. Contribution to Financial Stability

Banks have turned more toward transaction-based and service-based income as reforms like demonetization quicken digital adoption.

By lowering reliance on cyclical borrowing markets, this change helps long-term financial stability.

Better able to weather financial instability and changes in monetary policy are banks that effectively expand into non-interest options.

5. Growing Competition

Offering a wider range of fee-based goods—insurance, mutual funds, wealth management—banks might distinguish their service offerings.

This draws a more lucrative and varied clientele in addition to raising consumer happiness.

Cross-selling of non-lending services enhances consumer relationships and raises customer lifetime value (CLTV).

6. Help for adequate capital

Basel III and similar regulatory structures set banks' capital requirements.

Higher NII aids in preserving better capital adequacy ratios (CAR) without raising credit exposure and enhances the general income base.

It increases bank valuation and investor confidence in addition to assisting regulatory standard adherence.

7. Scalability and digital transformation

The fast digitizing of banking, particularly following demonetization, has created new means of generating NII via systems like UPI, IMPS, and digital wellets.

Once set up, these systems provide saleable services requiring little infrastructure investment, resulting in strong margins and consistent income expansion.

8. Determination of Adaptability and Innovation

A greater portion of NII in the income portfolio reveals a bank's capacity for innovation and policy change responsiveness as well as technological change adaptability.

It shows how successfully a bank has reacted to shifting consumer behavior, digital disruption, and market dynamics.

9. Better Asset-Liability Management (ALM)

Unlike fund-based income, which is interest-sensitive, NII is not. This simplifies asset-liability matching.

This revenue helps in financial management and smoother liquidity and acts as protection against mismatches in interest rates.

10. Performance's Strategic Indicator

These days, non-Int. Income is viewed as a vital performance indicator (KPI) for bank valuation, mergers and acquisitions, and performance bench marking.

It offers perspectives on the bank's long-term vision, client service quality, and institutional efficiency.

From a supplemental source of income, non-Int. Income has become a strategic component of commercial banking performance. It is absolutely necessary in contemporary banking for its contribution to improving operational efficiency, lowering risk, boosting profitability, and helping regulatory compliance. Particularly after demonetization, the move toward a balanced income system has changed public sector bank performance criteria in India. Digital investments, consumer-focused service models, and creative financial products will help to guarantee sustainable growth and competitiveness by supporting this change.

4.5 Recommendations to Increase NII In Banks

- Vary Fee-Based Services

Banks should provide a wider spectrum of fee-generating products including advisory services, wealth management, mutual funds, and insurance (assurance). This variety increases income stability and consumer choice.

- Improve Digital Banking Pathways

By improving and updating self-service kiosks, internet banking sites, and mobile banking applications, transaction volumes can be increased, therefore generating service charges and convenience fees at little cost.

- Monetize Transaction Services

Apply nominal fees on premium services like NEFT, RTGS, IMPS, UPI for large transactions or early processing. Price for service ought to strike a balance between prospective revenue and customer worth.

- Encourage Cross-Selling and Packaged Goods

Cross-sell services like locker amenities, demat accounts, or loan protection insurance among relationship managers. Per-customer revenue can rise by bundling services.

- Use Data Analytics for Personalization

Personalized product recommendations based on customer data, especially in fields like forex services, credit cards, and EMI conversions—driving higher engagement and fee income—should be provided.

- Improve forex and Treasury Services

By efficiently serving companies and NRIs, banks can boost revenues via active participation in foreign exchange transactions, derivatives, and treasury activities.

- Invest in Awareness and Consumer Education

Informing clients about the advantages of digital and value-added services promotes paid product acceptance and consumption.

- Create Tiered Service Models

Target HNI and NRI consumers for exclusive, high-margin services by developing premium service categories (e. g. , Platinum accounts) with advanced features for higher prices.

- Develop Alliances with FinTech

Partner with fintech companies to provide co-branded products, digital well ets, or payment gateways. Revenue sharing in such systems boosts non-Int. Income.

- Institutionalize Performance-Based Rewards

Motivating a proactive service culture, connect rewards to NII performance to get staff members to concentrate on non-interest product sales.

4.6 Impact Study Of Non Interest Income Of PSBs

In the changing environment of the Indian banking industry, non-Int. Income has come to be quite important for public sector banks. Diversifying revenue sources and improving financial stability depend critically on non-Int. Income, which includes income from fees, commissions, service fees, trading profits, and other sources outside of conventional lending. PSBs have been concentrating on increasing their non-Int. Income to enhance profitability, operational efficiency, and resiliency against economic volatility in light of growing pressure on interest-based income as a result of shifting interest rate regimes and increasing competition. This study aims to assess the trends, patterns, and general effect of non-Int. Income on the performance and sustainability of PSBs in India.

4.6.1 Ratio Of NII To Total Income Of The Banks Under Study

This ratio is a key indicator to assess the contribution of **non-Int. Income** to the **overall income** of banks. It reflects how much of the bank's total income is derived from sources other than interest, such as fees, commissions, service charges, trading income, etc.

Ratio Of NII To Total Income $= \frac{\text{Non Interest Income}}{\text{Total Income}} * 100$

In the table below the ratio of the study for All the banks has been shown :

PUBLIC SECTOR BANKS

1) BOB

Ratio of NII to total income of BOB is calculated by the rate of NII of individual year divided by total income.

Table 4.1

Ratio Of NII To Total Income Of BOB

(From 2011-12 To 2020-21) (Rs in crores)

Years	NII (Rs.)	Total Income	Ratio

		(Rs.)	(%)
2011-12	3287.1	25800.41	12.74%
2012-13	4100.42	34588.91	11.85%
2013-14	4510.62	40952.68	11.01%
2014-15	5555.15	46018.05	12.07%
2015-16	5449.27	50364.23	10.82%
2016-17	**5992.17**	**51791.8**	**11.57%**
2017-18	7936.78	52409.82	15.14%
2018-19	7992.21	54048.63	14.79%
2019-20	7887.05	60793.3	12.97%
2020-2021	12191.33	91086.66	13.38%
Average	6490.21	50785.449	12.63%
S.D.	2601.243797	17463.6552	0.014757991
C.V.(%)	40.079	34.387	11.681

Source: Annual Reports And Accounts Of BOB For The Period Under Study

The investigation of the proportion of non-Int. Income against total income for BOB from fiscal year 2011-12 to 2020-21 reveals that non-Int. Income significantly and consistently contributed to the bank's revenue. This proportion changed throughout the decade, bottoming at 10. 82% in 2015–16 and peaking at 15. 14% in 2017–18, therefore showing some changes in the bank's reliance on non-Int. Income. The average percentage for this period was 12. 63%, showing that around one-eighth of the bank's total income came from activities other than lending, including fees, commissions, and trading profits. The calculated standard deviation for this ratio was 1. 47%, which shows a moderate degree of variation; the coefficient of variation (C.V.) was reported at 11. 68%, reflecting a rather low level of fluctuation and consistent performance connected with non-Int. Income. Particularly as a result of pressure on interest margins, the bank's strategic measures targeted at raising income through service charges, online banking, and treasury operations can probably be related to the remarkable rise in 2017-18 and 2018–19. In essence, the results show BOB has kept a consistent and modest level of non-Int. Income, hence helping its financial strength.

Still, there is great opportunity to develop non-interest revenue streams to reduce reliance on Int. Income and boost long-run profit.

Table 4.2

- **T-Test Paired Two Sample For Means**

(RATIO 1 BOB) T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	11.698	13.57
Variance	0.62287	2.08735
Observations	5	5
Pearson Correlation	-0.6009918	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-2.0721433	
P(T<=t) one-tail	0.0534851	
t Critical one-tail	2.1318468	
P(T<=t) two-tail	0.1069701	
t Critical two-tail	2.7764451	

Data Is Calculated By Researcher

Decision :

To see if the means of two linked variables for BOB (BOB) vary significantly, the paired sample t-test was run. Variable 1 and Variable 2 are named. Variable 1 has a mean of 11. 698; Variable 2 has a mean of 13. 57, suggesting an evident rise. With 4 degrees of freedom (df), the test produced a t-statistic of -2. 072. With a two-tailed p-value of 0. 107, which is higher than the significance level of 0. 05, the observed mean difference is not statically significant at the 5% level. Likewise, the one-tailed p-value of 0. 053 is somewhat more than 0. 05, which implies minimal non-significance should a directional hypothesis be taken into account. Furthermore, the t-

critical value (two-tailed) is 2. 776, which is greater than the calculated t-statistic, which further supports the idea that we cannot reject the null hypothesis. Given the information at hand, there is hence no solid proof to declare a statically significant difference between the two sets of BOB observations.

2) SBI

To find the ratio of non-Int. Income to Total Income of SBI, the calculation method is the rate of Non-Int. Income of individual year divided by Total Income of SBI.

Table 4.3

Ratio Of NII To Total Income Of (SBI)

(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income (Rs.)	Total Income(Rs.)	Ratio (%)
2011-12	34207.48	147873.92	23.13%
2012-13	29835.43	177032.82	16.85%
2013-14	32581.69	200559.93	16.25%
2014-15	37882.13	226944.56	16.69%
2015-16	49315.17	257289.51	19.17%
2016-17	**52828.39**	**273461.13**	**19.32%**
2017-18	68192.96	298640.45	22.83%
2018-19	75521.03	301491.31	25.05%
2019-20	76898.74	330220.88	23.29%
2020-2021	92377.43	362229.09	25.50%
Average	54964.045	257574.36	20.81%
S.D.	22035.32713	68966.72169	0.035581856
C.V(%)	40.090	26.775	17.1

Source: Annual Reports And Accounts Of SBI For The Period Under Study

The ratio of non-Int. Income to total income for the specified bank over the years 2011–12 to 2020–21 shows a clear upward trend and increasing relevance of non-Int.

Income in the general revenue mix of the bank. Beginning at 23. 13% in 2011–12, the ratio changed somewhat in the following years, hitting a low of 16. 25% in 2013–14. From 2015–16 onward, however, the share of non-interest revenue shows a clear rise, reaching 25. 50% in 2020–21. With an average ratio of 20. 81% for the whole decade, around one-fifth of the bank's overall revenue routinely came from non-interest sources including commissions, fees, trading income, and other service fees. With a coefficient of variation (C.V.) of 17. 1%, which reflects a fairly stable performance in producing non-Int. Income relative to total income, the standard deviation of the ratio is 3. 56% suggests moderate volatility over time. The stability and slow growth in the ratio show how the bank is trying to diversify its income sources and lessen its dependency on conventional interest-based income. This deliberate change probably enabled the bank to reduce credit growth difficulties, asset quality pressures, and hazards related to changing interest rates. The data generally indicate that over the study period, the bank has successfully boosted its non-Int. Income base, therefore enhancing financial resilience, higher profitability, and better operational efficiency.

Table 4.4

- **T-Test Paired Two Sample For Means**

(RATIO 1 SBI) T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.18418	0.23198
Variance	0.000822832	0.000597797
Observations	5	5
Pearson Correlation	-0.717873706	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-2.169330269	
P(T<=t) one-tail	0.047940982	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.095881964	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

To contrast the mean of Variable 1 and Variable 2 for SBI, a paired sample t-test was run. Variable 1's mean value is 0. 18418; Variable 2's is 0. 23198—a little rise is seen here. With four degrees of freedom, the t-statistic value is -2. 1693. With 0. 04794, the one-tailed p-value is slightly below the often used 0. 05 significance threshold. In a one-tailed test, this implies that the two means are statically significantly different, therefore we can reject the null hypothesis in favor of the alternative hypothesis. If we are testing for any difference in either direction, though, the two-tailed p-value is 0. 09588, which is bigger than 0. 05. This means that the difference isn't statically significant. The t-critical value for the two-tailed test is 2. 776, which is more than the absolute value of the t-statistic. This shows that the result is not significant in the two-tailed context. Under a one-tailed test, but not under a two-tailed test, the data offers faint evidence of a notable rise in the mean from Variable 1 to Variable 2 for SBI.

3) <u>BOI</u>

To find the ratio of non-Int. Income to Total Income of BOI, the calculation method is the rate of Non-Int. Income of individual year divided by Total Income of BOI. The ratio has been shown in the table below:

Table 4.5

Ratio Of NII To Total Income Of BOI

(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income (Rs.)	Total Income (Rs.)	Ratio (%)
2011-12	2641.82	24523.25	10.17%
2012-13	3319.24	31390.19	10.39%
2013-14	3784.6	35880.43	10.55%
2014-15	4319	42444.18	10.18%
2015-16	4287.07	47962.94	8.92%
2016-17	**3671.61**	**45764.46**	**8.02%**
2017-18	6819.43	46404.67	14.69%
2018-19	5845.89	44158.69	13.24%

2019-20	5264.03	46268.85	11.38%
2020-2021	6808.89	49399.66	13.78%
Average	4676.158	41419.732	11.13%
S.D.	1449.855484	8158.506831	0.021467019
C.V.(%)	31.005	19.697	19.284

Source: Annual Reports And Accounts Of BOI For The Period Under Study

The ratio of non-Int. Income to total income for the bank between 2011–12 and 2020–21 indicates an inconsistent but typically small contribution of non-Int. Income to total revenue. Starting at 10. 17% in 2011-12, the ratio stayed fairly constant at about 10% for the following few years, with a little drop in 2015-16 and 2016-17 when it sank to 8. 92% and 8. 02% correspondingly. With 14. 69% in 2017–18, a clear increase indicated a probable change in the bank's approach toward boosting fee-based and service-related revenue. This rising trend kept going in following years, with the ratio remaining around 11% until 2020–21, when it hit 13. 78%.

The average ratio over the ten years was 11. 13%, which means that, on average, about one-tenth of the bank's income came from things other than interest, like commissions, fees, and trading. Moderate variation is shown by the standard deviation (S. D.) of 2. 15%; the coefficient of variation (C. V.) of 19. 28% for the ratio indicates some inconsistency in non-Int. Income performance across the years. Still, the bank showed improvement in the later part of the decade, which points to a slow growth of other income sources.

The data shows the bank's modest reliance on non-Int. Income and evidence of deliberate improvement in recent years. Further raising this ratio may enable the bank to lower its reliance on Int. Income, boost profitability, and buffer against future market and credit risks.

Table 4.6

- **T-Test Paired Two Sample For Means**

(RATIO 1 BOI) T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**

Mean	0.10042	0.12222
Variance	0.000041837	0.000698
Observations	5	5
Pearson Correlation	-0.150115815	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-1.733048462	
P(T<=t) one-tail	0.079058923	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.158117846	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Whether there is a notable difference between the means of Variable 1 and Variable 2 for BOI (BOI) was investigated using a matched sample t-test. With Variable 1 having a mean of 0. 10042 and Variable 2 having a mean of 0. 12222, there is a little rise. With 4 degrees of freedom, the test yielded a t-statistic of -1. 7330. The one-tailed p-value of 0. 0791 is higher than the 0. 05 significance level, which indicates that in a one-tailed environment the outcome is not statically significant. Likewise, the two-tailed p-value of 0. 1581 is much above 0. 05, which suggests once more that the observed difference is not statically significant in either way. Moreover, the t-critical values—2. 1318 for one-tailed and 2. 7764 for two-tailed—are both more than the absolute value of the t-statistic, so strengthening the result that we do not reject the null hypothesis. Thus, according to the information currently accessible, for BOI there is no appreciable evidence to indicate a noticeable difference between the two factors.

4) <u>BOM</u>

To find the ratio of non-Int. Income to Total Income of BOM, the calculation method is the rate of Non-Int. Income of individual year divided by Total Income of BOM. The ratio has been shown in the table below:

Table 4.7

Ratio Of NII To Total Income Of BOM

IMPACT OF DEMONETIZATION ON NON FUND BASE INCOME OF PUBLIC SECTOR BANKS IN INDIA

(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income (Rs.)	Total Income (Rs.)	Ratio (%)
2011-12	536.1	6099.19	8.79%
2012-13	647.57	7861.55	8.24%
2013-14	922.35	10535.79	8.75%
2014-15	907.36	12864.04	7.05%
2015-16	1020.31	13685.77	7.45%
2016-17	**1037.17**	**14090.18**	**7.36%**
2017-18	1524.81	13586.79	11.22%
2018-19	1539.73	12636.16	12.19%
2019-20	1568.23	12417.91	12.63%
2020-2021	1650.23	13145.76	12.23%
Average	1135.386	11692.314	9.59%
S.D.	406.1937984	2697.957789	0.022311006
C.V.(%)	35.775	23.074	23.262

Source: Annual Reports And Accounts Of BOM For The Period Under Study

From 2011-12 to 2020-21, the ratio of non-interest revenue to total revenue for the bank indicates a somewhat low but improving trend in the share of non-Int. Income to the bank's total profits. In the initial years, the ratio remained below 9%, with the lowest point observed in 2014-15 at 7. 05%. This suggests a strong dependence on Int. Income during the early part of the decade. However, starting from 2017-18, there was a significant improvement, with the ratio rising above 11% and reaching a peak of 12. 63% in 2019-20, followed by a marginal dip to 12. 23% in 2020-21. This upward shift reflects the bank's increased efforts in diversifying its income base by strengthening fee-based services, commissions, and other non-lending activities.

The average non-Int. Income to total income ratio over the ten-year period was 9. 59%, indicating that less than one-tenth of the bank's income came from non-interest sources. With a standard deviation of 2. 23% and a coefficient of variation (C.V.) of 23. 26%, the ratio shows a somewhat high degree of variance. This means that even if the bank did improve its non-Int. Income, the growth wasn't consistent throughout the time.

The data suggests that the bank historically depended more on Int. Income, but recent years show a clear shift toward raising non-Int. Income to improve financial stability and lower risk. The bank still has considerable scope to further develop its non-Int. Income streams to achieve a more balanced and resilient income structure.

Table 4.8

- **T-Test Paired Two Sample For Means**

(RATIO 1 BOM) T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.08056	0.11126
Variance	0.000060838	0.00047
Observations	5	5
Pearson Correlation	-0.61947752	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-2.52270641	
P(T<=t) one-tail	0.032584312	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.065168625	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

BOM's Ratio 1 across two distinct time periods was compared using a paired sample t-test. The average values for Variable 1 and Variable 2 were 0.08056 and 0.11126,

respectively; this suggested a discernible rise. The t-statistic is -2.52, which surpasses the critical t-value for one-tail (2.13) but not for two-tail (2.77). While the two-tailed p-value (0.0652) is slightly above 0.05, the one-tailed test's p-value (0.0325) is less than 0.05.

Since the one-tailed p-value is substantial, we infer that the mean of Ratio 1 rises statically significantly from Variable 1 to Variable 2. Assuming an anticipated directional rise was being examined, this implies that BOM improved its Ratio 1 over the second period. Under a two-tailed test, though, this conclusion would not be particularly important.

5) Central Bank Of India

To find the ratio of non-Int. Income to Total Income of Central Bank Of India, the calculation method is the rate of Non-Int. Income of individual year divided by Total Income of Central Bank Of India. The ratio has been shown in the table below:

Table 4.9

Ratio Of NII To Total Income Of Central Bank Of India

(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income (Rs)	Total Income (Rs)	Ratio (%)
2011-12	1239.49	16513.65	7.50%
2012-13	1409.37	20578.3	6.85%
2013-14	1676.67	23573.43	7.11%
2014-15	1931.38	26409.69	7.31%
2015-16	1900.39	28376.37	6.69%
2016-17	**1944.47**	**27932.13**	**6.96%**
2017-18	2871.47	20646.12	13.91%
2018-19	2620.41	26783.53	9.78%
2019-20	2416.33	25164.95	9.60%
2020-2021	3622.4	27297.99	13.27%
Average	2163.238	24327.616	8.90%
S.D.	725.1735804	3923.056776	0.027081

C.V%	33.522	16.125	30.434

Source: Annual Reports And Accounts Of Central Bank Of India For The Period Under Study

The provided data emphasizes the ten-year span from 2011–12 to 2020–21 trends in Non-Int. Income, Total Income, and their Ratio as a percentage for a bank (or a collection of banks).

The average non-Int. Income over the period is ₹2,163. 24 crore with a coefficient of variation (C. V.) of 33. 52%, indicating a moderate level of fluctuation in non-Int. Income across the years. From the data, it is clear that Non-Int. Income has shown a generally increasing trend over the years, rising from ₹1,239. 49 crore in 2011-12 to ₹3,622. 4 crore in 2020-21. Total Income, on the other hand, has also increased overall, from ₹16,513. 65 crore in 2011–12 to ₹27,297. 99 crore in 2020–21, with an average of ₹24,327. 62 crore and a relatively lower C. V. of 16. 13%, which indicates more stability in total income than in non-Int. Income.

Over time, the Ratio of Non-Int. Income to Total Income has changed. This ratio shows how much income from things other than the main business activity helps to make up the total income. During 2011–12 to 2016–17, it remained between 6. 69% and 7. 50%, but in 2017–18 it saw a significant increase to 13. 91%, probably as a result of a deliberate change in direction or extraordinary income sources in that year. In 2020–21, a likewise high ratio of 13. 27% was observed again, maybe pointing to an increasing dependence on fee-based revenue and services, especially in the post-demonetization or pandemic era when lending margins may have shrunk.

The average ratio over the ten-year period is 8. 90%, with a standard deviation of 2. 71% and a C. V. of 30. 43%. This shows that there is a lot of variation in how much non-Int. Income makes up the total income each year. This variation implies that although non-interest revenue is becoming more and more significant, it is less reliable than core income sources and could be more susceptible to policies or outside influences.

Finally, the data reveals a growing but erratic part for non-Int. Income in the revenue makeup of the bank. The rising trend in absolute non-Int. Income is a good sign of diversification, but the variable ratio shows that we need to use consistent methods to make sure this income stream stays stable and grows over time.

Table 4.10

- **T-Test Paired Two Sample For Means**

(Central Bank) Ratio 1 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.07092	0.10704
Variance	0.000010862	0.0008238
Observations	5	5
Pearson Correlation	-0.949365614	
Hypothesized Mean Difference	0	
df	4	
t Stat	-2.536005396	
P(T<=t) one-tail	0.032126521	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.064253042	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

To evaluate Central Bank's Ratio 1 across two timeframes, a paired sample t-test was carried out. Showing an increase, the mean of Variable 1 is 0.07092; that of Variable 2 is 0.10704. The computed t-statistic is -2.5360, which exceeds the critical t-value for a one-tailed test (2.1318), and the one-tail p-value is 0.0321, which is less than 0.05. The two-tail p-value is 0.0642, just over 0.05, and the two-tail t-critical value is 2.7764.

Under the one-tailed test, the result is statically significant, showing a significant rise in Ratio 1 from Variable 1 to Variable 2. Assuming an upward direction was predicted, this points to an improvement in the bank's performance on this ratio in the second period. Under a two-tailed test, the result is not, however, significant, so the significance relies on whether a certain directional variation was anticipated.

6) Canara Bank

To find the ratio of non-Int. Income to Total Income of Canara Bank, the calculation method is the rate of Non-Int. Income of individual year divided by Total Income of Canara Bank. The ratio has been shown in the table below:

Table 4.11
Ratio Of NII To Total Income Of Canara Bank
(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income (Rs.)	Total Income (Rs.)	Ratio (%)
2011-12	2668.49	25792.6	10.34%
2012-13	3104.51	33920.15	9.15%
2013-14	3307.65	33377.52	8.85%
2014-15	4143.68	43713.84	9.48%
2015-16	4733.45	48546.82	9.75%
2016-17	**5131.26**	**49170.75**	**10.43%**
2017-18	7852.26	49308.98	15.92%
2018-19	7398	48743.32	15.18%
2019-20	7372.41	54270.13	13.58%
2020-2021	11799.4	61558.15	19.17%
Average	5751.111	44840.226	12.19%
S.D.	2844.462752	10805.50654	0.035547
C.V.%	49.459	24.097	28.251

Source: Annual Reports And Accounts Of Canara Bank For The Period Under Study

For a bank (or a group of banks) over the ten-year period from 2011–12 to 2020–21, the given data shows the Non-Int. Income, Total Income, and the Ratio (%) of Non-Int.

Income to Total Income. The rising mix of bank revenues shown by this data emphasizes the need of fee-based and other non-core income streams.

From 2011-12 to 2020-21, Non-Int. Income has grown consistently and dramatically, going from ₹2,668. 49 crore to ₹11,799. 4 crore. At ₹5,751. 11 crore, the average Non-Int. Income over the period shows significant volatility in earnings from these non-core sources as indicated by a high coefficient of variance (C. V.) of 49. 46%. Total Income also showed an upward trend, rising from ₹25,792. 6 crore in 2011–12 to ₹61,558. 15 crore in 2020–21, with an average of ₹44,840. 23 crore and a C. V. of 24. 10%, indicating somewhat more consistent growth in general income.

One of the most important indicators of how much banks depend on several sources outside of conventional lending is the ratio of non-Int. Income to total income. In the early years, this ratio was around 9–10%, but starting in 2016–17 it began to increase dramatically, reaching 19.17% in 2020–21. Several causes including technological advancements in banking services, growing reliance on fee-based products, and perhaps strategic responses to lower net interest margins or outside economic shocks like demonetization and the COVID-19 epidemic might explain this surge. The average ratio throughout the decade is 12. 19%, with a standard deviation of 3. 55% and a C. V. of 28. 25%, which points to somewhat variable levels.

All things considered, the statistics show a definite increase in Non-Int. Income's share of the bank's overall revenue, particularly in the second half of the decade. Long-term sustainability is enhanced by this diversification of income streams. The great volatility, however, emphasizes the necessity of a more organized and methodical approach on non-Int. Income creation as it shows that banks still struggle to keep consistency in this income level.

Table 4.12

- **T-Test Paired Two Sample For Means**

(Canara Bank) Ratio 1 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.09514	0.14856
Variance	3.2813E-05	0.001026633

Observations	5	5
Pearson Correlation	-0.43543929	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-3.420864831	
P(T<=t) one-tail	0.013379462	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.026758924	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

A paired sample t-test was carried out to assess the variation in Ratio 1 for Canara Bank over two different time frames. The average rose from 0. 09514 (Variable 1) to 0. 14856 (Variable 2), indicating a significant increase. The t-statistic stands at -3. 42, surpassing the critical value for both one-tailed (2. 13) and two-tailed (2. 77) assessments. Similarly, the p-values are 0. 0134 (one-tail) and 0. 0268 (two-tail), which are both below the 0. 05 threshold.

The findings are statically relevant for both one-tailed and two-tailed tests, pointing to a considerable and impactful increase in Ratio 1 during the examined periods. This suggests a notable enhancement in Canara Bank's performance concerning this ratio, likely attributed to strategic or operational improvements made during the latter period.

7) Indian Bank

To find the ratio of non-Int. Income to Total Income of Indian Bank, the calculation method is the rate of Non-Int. Income of individual year divided by Total Income of Indian Bank. The ratio has been shown in the table below:

Table 4.13

Ratio Of NII To Total Income Of Indian Bank

(From 2011-12 To 2020-21) (Rs in crores)

IMPACT OF DEMONETIZATION ON NON FUND BASE INCOME OF PUBLIC SECTOR BANKS IN INDIA

Years	Non Int Income (Rs.)	Total Income (Rs.)	Ratio (%)
2011-12	1188.06	10550.82	11.26%
2012-13	1194.71	13422.43	8.90%
2013-14	1293.4	15186.2	8.52%
2014-15	1378.03	16627.46	8.29%
2015-16	1372.21	17225.46	7.97%
2016-17	**1788.94**	**18033.2**	**9.92%**
2017-18	2222.4	18262.22	12.17%
2018-19	2416.59	19531.92	12.37%
2019-20	1891.43	21073.48	8.97%
2020-2021	3325.5	24666.79	13.48%
Average	1807.127	17457.998	10.19%
S.D.	687.3687461	3947.109005	0.019774914
C.V.%	38.036	22.609	19.415

Source: Annual Reports And Accounts Of Indian Bank For The Period Under Study

Over a ten-year period from 2011–12 to 2020–21, the provided data shows the trends of Non-Int. Income, Total Income, and the Ratio (%) of Non-Int. Income to Total Income. Understanding the part and consistency of non-core income sources in the bank's whole revenue structure depends on this analysis.

Non-Int. Income has had a volatile but generally rising trend over the decade, from ₹1,188. 06 crore in 2011-12 to ₹3,325. 50 crore in 2020-21. The average non-Int. Income over the period is ₹1,807. 13 crore, with a standard deviation of ₹687. 37 crore and a fairly high coefficient of variation (C. V.) of 38. 04%, which indicates significant year-to-year variation in income from non-core sources.

Total Income, meanwhile, increased from ₹10,550. 82 crore to ₹24,666. 79 crore, with an average of ₹17,457. 99 crore and a C. V. of 22. 61%, suggesting more stable and consistent growth than non-Int. Income. Reflecting the changing reliance on non-Int. Income over time, the Ratio of Non-Int. Income to Total Income ranged from a low of 7. 97% in 2015-16 to a high of 13. 48% in 2020-21. The average ratio over the period is 10. 19%, with a standard deviation of 1. 98% and a C. V. of 19. 42%, indicating moderate variations in the proportion of non-Int. Income.

The data shows that while non-Int. Income has become a major source of total income, especially in later years like 2017-18, 2018-19, and 2020-21, it has been a little erratic. Peaks in the ratio in these years could be because of strategic changes or outside factors like changing interest rates or economic issue that made people rely more on fees, commissions, trading income, or other services.

Finally, the study shows a steady and positive rise in non-Int. Income, with a little but increasing contribution to overall income. But the comparatively high volatility points to the necessity of improved techniques and variety to guarantee consistent and reliable income stream expansion, therefore enabling banks to lessen reliance on conventional interest-based sources.

Table 4.14

- **T-Test Paired Two Sample For Means**

(Indian Bank) Ratio1 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.08988	0.11382
Variance	0.000172807	0.000349
Observations	5	5
Pearson Correlation	-0.438402993	
Hypothesized Mean Difference	0	
df	4	
t Stat	-1.971946581	
P(T<=t) one-tail	0.059950949	

t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.119901898	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

A paired sample t-test was conducted to evaluate Ratio 1 over two different time frames for Indian Bank. The average rose from 0. 08988 (Variable 1) to 0. 11382 (Variable 2), indicating a favorable shift. Nevertheless, the computed t-statistic stands at -1. 97, which is lower than the critical t-values for both the one-tailed (2. 13) and two-tailed (2. 77) tests. The p-values obtained are 0. 0599 (one-tailed) and 0. 1199 (two-tailed), both of which surpass 0. 05.

Because both p-values are above the 0. 05 threshold for significance, the findings are not statically significant. This implies that the noted rise in Ratio 1 for Indian Bank is insufficient

to eliminate the possibility of random fluctuation. As a result, there is no definitive proof to claim that the bank's performance in this ratio showed significant improvement between the two time periods.

8) Indian Overseas Bank

To find the ratio of non-Int. Income to Total Income of Indian Overseas Bank, the calculation method is the rate of Non-Int. Income of individual year divided by Total Income of Indian Overseas Bank. The ratio has been shown in the table below:

Table 4.15

Ratio Of NII To Total Income Of Indian Overseas Bank

(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income (Rs.)	Total Income (Rs.)	Ratio (%)
2011-12	1225.1	13326.48	9.19%
2012-13	1681.04	19578.12	8.58%

2013-14	1972.91	22643.63	8.71%
2014-15	2209.52	24853.07	8.89%
2015-16	2138.6	26076.93	8.20%
2016-17	**2528.26**	**26045.55**	**9.70%**
2017-18	3372.64	23091.25	14.60%
2018-19	3746.44	21661.65	17.29%
2019-20	4206.32	21837.59	19.26%
2020-2021	3306.37	20712.48	15.96%
Average	2638.72	21982.675	12.04%
S.D.	970.3446098	3736.069584	0.042548999
C.V.%	36.773	16.995	35.345

Source: Annual Reports And Accounts Of Indian Overseas Bank For The Period Under Study

The ratio (%) of Non-Int. Income to Total Income for a bank (or group of banks) throughout a ten-year period from 2011–12 to 2020–21 is presented in the provided data together with Non-Int. Income and Total Income. This examination evaluates the income produced from non-core banking operations in terms of contribution, consistency, and growth.

Non-Int. Income surged sharply from ₹1,225. 10 crore in 2011–12 to a peak of ₹4,206. 32 crore in 2019–20, then somewhat declined to ₹3,306. 37 crore in 2020–21. The average non-Int. Income is ₹2,638. 72 crore, with a standard deviation of ₹970. 34 crore indicating significant year-to-year fluctuation. The coefficient of variation (C. V.) of 36. 77% confirms this variance, reflecting changing reliance on fee-based income, commissions, and other non-core services.

From ₹13,326. 48 crore in 2011–12 to ₹26,076. 93 crore in 2015–16, Total Income generally rose before some stability and a modest fall in the later years, reaching ₹20,712. 48 crore in 2020–21. The average total revenue for the period is ₹21,982. 68 crore, with a C. V. of 16. 99%—indicating a rather consistent income trend.

Until 2016–17, the Ratio of Non-Int. Income to Total Income, a main measure of revenue diversification, stayed under 10%, but after that there was a sharp rise, reaching 19. 26% in 2019–20. This suggests a strategic or structural change in the income profile of the bank, with increasing focus on non-fund-based sources. The average ratio for the period is 12. 04%, with a standard deviation of 4. 25% and a high C. V. of 35. 35%, which shows that the contribution of non-Int. Income to overall earnings varies a lot.

Table 4.16

- **T-Test Paired Two Sample For Means**

(Indian Ov. Bank) Ratio 1t-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.08714	0.15362
Variance	1.3493E-05	0.0012977
Observations	5	5
Pearson Correlation	-0.41980744	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-3.94167548	
P(T<=t) one-tail	0.00846797	
t Critical one-tail	2.13184679	
P(T<=t) two-tail	0.01693593	
t Critical two-tail	2.77644511	

Data Is Calculated By Researcher

Decision :

To evaluate two collections of observations, Ratio 1 of Indian Overseas Bank was paired t-test. The mean of Variable 1 (0.08714) is much lower than that of Variable 2 (0.15362). With 4 degrees of freedom, the computed t-statistic is -3.94. Because the p-value (two-tail) of 0.0169 is less than the 0.05 significance level, the difference

between the two averages is statically significant. We thus deny the null hypothesis and decide that Ratio 1 shows a substantial change over the two periods.

9) PNB

To find the ratio of non-Int. Income to Total Income of PNB, the calculation method is the rate of Non-Int. Income of individual year divided by Total Income of PNB. The ratio has been shown in the table below:

Table 4.17
Ratio Of NII To Total Income Of PNB
(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Total Income	Ratio (%)
2011-12	3655.36	31204.53	11.71%
2012-13	4239.51	41686.82	10.16%
2013-14	4302.03	47380.14	9.08%
2014-15	4710.34	49668.44	9.48%
2015-16	6174.6	54884.42	11.25%
2016-17	**6976**	**57780.47**	**12.07%**
2017-18	9167.58	23524.26	38.97%
2018-19	8888.35	60608.2	14.66%
2019-20	7367.39	59520.52	12.38%
2020-2021	9387.66	64306.13	14.59%
Average	6486.882	49056.393	14.44%
S.D.	2197.919006	13390.07076	0.08825032
C.V.%	33.88	27.29	61.13

Source: Annual Reports And Accounts Of PNB For The Period Under Study

For a bank or a collection of banks over ten years from 2011–12 to 2020–21, the given data provides a thorough review of Non-Int. Income, Total Income, and the

Ratio of Non-Int. Income to Total Income (%). It shows how income from non-core banking operations like fees, commissions, and other non-interest-based lending activities fluctuates and trends.

Non-Int. Income grew significantly over this time, from ₹3,655. 36 crore in 2011-12 to ₹9,387. 66 crore in 2020-21, with an average of ₹6,486. 88 crore. A standard deviation of ₹2,197. 92 crore and a coefficient of variation (C. V.) of 33. 83% point to somewhat to highly fluctuating non-Int. Income, maybe in response to temporary spikes brought on by policy changes, one-time transactions, or more fee-based services.

Starting from ₹31,204. 53 crore in 2011–12 and peaking at ₹64,306. 13 crore in 2020–21, with an average of ₹49,056. 39 crore, total income also followed an overall upward trend. The standard deviation of ₹13,390. 07 crore and a C. V. of 27. 30% indicate some volatility in total income, most likely as a result of variations in interest earnings and market conditions. From 2011–12 to 2016–17, the Ratio of Non-Int. Income to Total Income—which gauges the proportion of non-core income—ranged between 9. 08% and 12. 07%, indicating a rather stable trend. However, the ratio stayed higher than in prior years, with values of 14. 66% in 2018-19 and 14. 59% in 2020-21. The average ratio over the decade is 14. 44%, with a standard deviation of 8. 83% and a very high C. V. of 61. 14%, showing that the contribution of non-Int. Income varies greatly from year to year. This is likely because the total income went down a lot or the non-Int. Income went up a lot (possibly because of asset sales, settlements, or restructuring gains). Although the ratio went back to normal after, it stayed higher than in the past.

In essence, the statistics reveal a clear upward trend in non-Int. Income, whether measured in total or as a proportion of total income. This change points to the increasing relevance of several income sources in the banking industry. But the ratio's high volatility points out that we need more reliable and long-lasting ways to make money from things other than interest. To lessen reliance on Int. Income and improve financial stability, banks should concentrate on improving reliable fee-based activities including digital banking, insurance distribution, investment advisory, and transaction services.

Table 4.18

- **T-Test Paired Two Sample For Means**

(Punjab Bank) Ratio 1 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.10336	0.18534
Variance	0.000126613	0.0131962
Observations	5	5
Pearson Correlation	-0.115068988	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-1.570723376	
P(T<=t) one-tail	0.095669521	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.191339043	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

Ratio 1 of Punjab Bank was tested with a paired t-test to assess two linked samples. Variable 1 has a mean of 0.10336, variable 2 of 0.18534. The t-statistic is -1.57 with a two-tail p-value of 0.1913. The p-value exceeds 0.05, therefore the variance between the two means is not statically significant. We therefore cannot reject the null hypothesis: Punjab Bank exhibits no noteworthy change in Ratio 1 between the two time frames.

10) Union Bank Of India

To find the ratio of non-Int. Income to Total Income of Union Bank Of India, the calculation method is the rate of Non-Int. Income of individual year divided by Total Income of Union Bank Of India . The ratio has been shown in the table below:

Table 4.19

IMPACT OF DEMONETIZATION ON NON FUND BASE INCOME OF PUBLIC SECTOR BANKS IN INDIA

Ratio Of NII To Total Income Of Union Bank Of India

(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income (Rs.)	Total Income (Rs.)	Ratio (%)
2011-12	2039.72	18500.42	11.02%
2012-13	2316.31	23468.79	9.87%
2013-14	2868.04	28036.57	10.23%
2014-15	3140.73	32534.26	9.65%
2015-16	3957.12	36982.58	10.70%
2016-17	**3934.43**	**36250.1**	**10.85%**
2017-18	5429.98	38246.02	14.19%
2018-19	5462.08	38413.13	14.22%
2019-20	5041.71	39355.19	12.81%
2020-2021	5789.27	43241.49	13.38%
Average	3997.939	33502.855	11.69%
S.D.	1381.321883	7831.05681	0.017795617
C.V.%	34.550	23.374	15.220

Source: Annual Reports And Accounts Of Union Bank Of India For The Period Under Study

Between 2011–12 and 2020–21, a bank's Non-Int. Income, Total Income, and their Ratio (%) over a ten-year period are shown in the given data. Non-Int. Income grew from ₹2,039. 72 crore to ₹5,789. 27 crore, with an average of ₹3,997. 94 crore and a C. V. of 34. 55%, showing moderate fluctuation. Similarly, Total Income grew from

₹18,500. 42 crore to ₹43,241. 49 crore, averaging ₹33,502. 86 crore and a C. V. of 23. 37%, showing fairly steady growth.

Over the ten years, the ratio of Non-Int. Income to Total Income ranged from 11. 02% in 2011–12 to 14. 22% in 2018–19, averaging 11. 69%. With a modest upward trend in recent years, the standard deviation of 1. 78% and C. V. of 15. 22% imply that the contribution of non-interest revenue stayed quite consistent. This shows that, despite the fact that non-Int. Income has regularly accounted for a sizable portion of overall income, its increase has been consistent rather than erratic, therefore implying successful revenue diversification and a balanced income structure.

Table 4.20

- **T-Test Paired Two Sample For Means**

(Union Bank) Ratio 1 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.10294	0.1309
Variance	0.000032263	0.00019168
Observations	5	5
Pearson Correlation	-0.593507149	
Hypothesized Mean Difference	0	
df	4	
t Stat	-3.509932525	
P(T<=t) one-tail	0.012336707	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.024673413	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

Ratio 1 of Union Bank was subjected to a paired t-test to examine two linked samples. Variable 1's mean is 0.10294; variable 2's mean is 0.1309. With a p-value (two-tail) of 0.0247, the computed t-statistic is -3.51. The result is statically significant because the

p-value is less than 0.05. Accordingly, we reject the null hypothesis and determine that there is a substantial variation in Ratio 1 for Union Bank between the two eras.

11) UCO Bank

To find the ratio of non-Int. Income to Total Income of UCO Bank , the calculation method is the rate of Non-Int. Income of individual year divided by Total Income of UCO Bank. The ratio has been shown in the table below:

Table 4.21
Ratio Of NII To Total Income Of UCO Bank
(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income (Rs.)	Total Income (Rs.)	Ratio (%)
2011-12	925.41	12296.21	7.53%
2012-13	965.55	15597.92	6.19%
2013-14	952.17	17703.88	5.38%
2014-15	1320.51	19550.43	6.75%
2015-16	2003.55	21362.54	9.38%
2016-17	**1596.31**	**20157.28**	**7.92%**
2017-18	2114.49	10744	19.58%
2018-19	1121	15141.13	7.40%
2019-20	1513.51	15844.14	9.55%
2020-2021	2871.21	18000.55	15.95%
Average	1538.371	16639.808	9.56%
S.D.	632.2691117	3394.839953	0.0458823
C.V.%	41.099	20.401	33.680

Source: Annual Reports And Accounts Of UCO Bank For The Period Under Study

From ₹925. 41 crore in 2011–12 to ₹2,871. 21 crore in 2020–21, Non-Int. Income rose with an average of ₹1,538. 37 crore and a high coefficient of variation (C. V.) of 41. 10%, which shows notable year-to-year volatility. Total Income also rose over the same time, with an average of ₹16,639. 81 crore and a moderate C. V. of 20. 40%, indicating more steady growth in general income.

The Ratio of Non-Int. Income to Total Income averaged 9. 56%, with notable peaks in 2017-18 (19. 58%) and 2020-21 (15. 95%), likely due to temporary income spikes or reductions in total income. The 33. 68% C. V. for the ratio shows that there is a lot of variation in how much non-Int. Income contributes to the total income. This shows that people don't always rely on non-core revenue sources. The data generally indicates that although non-Int. Income has expanded and is becoming more and more significant, its contribution varies and calls for more consistent and deliberate development.

Table 4.22

- **T-Test Paired Two Sample For Means**

(Uco Bank) Ratio 1 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.07046	0.1208
Variance	0.000231943	0.002920895
Observations	5	5
Pearson Correlation	0.277760421	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-2.168058784	
P(T<=t) one-tail	0.048009262	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.096018523	

t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

The paired t-test for UCO Bank Ratio 1 reveals a statically significant rise in Variable 2 relative Variable 1 in the one-tailed test ($p = 0.048 < 0.05$). But the two-tailed test result is not meaningful ($p = 0.096 > 0.05$), showing the direction of change matters.

12) P&S Bank

To find the ratio of non-Int. Income to Total Income of P&S Bank , the calculation method is the rate of Non-Int. Income of individual year divided by Total Income of Punjab & Sind Bank. The ratio has been shown in the table below:

Table 4.23

Ratio Of NII To Total Income Of P&S Bank

(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income (Rs.)	Total Income (Rs.)	Ratio (%)
2011-12	437.08	5369.59	8.14%
2012-13	417.46	6891.96	6.05%
2013-14	417.15	7757.28	5.38%
2014-15	427.28	8399.99	5.08%
2015-16	428.75	9017.3	4.75%
2016-17	**478.48**	**9222.82**	**5.19%**
2017-18	578.1	8750.97	6.60%
2018-19	581.2	8529.95	6.81%
2019-20	828.28	9386.95	8.82%
2020-2021	897.39	8826.92	10.16%
Average	549.117	8215.373	6.70%
S.D.	177.2376294	1242.053725	0.018084235

C.V.%	32.276	15.118	26.999

Source: Annual Reports And Accounts Of P&S Bank For The Period Under Study

The provided data shows how Non-Int. Income, Total Income, and their Ratio (%) performed from 2011-12 to 2020-21. Non-Int. Income grew modestly from ₹437. 08 crore to ₹897. 39 crore during this time, with an average of ₹549. 12 crore and a coefficient of variation (C. V.) of 32. 28%, which shows that it varied a bit. With an average of ₹8,215. 37 crore, Total Income also increased steadily. A relatively lower C. V. of 15. 12% denotes more consistent growth.

The Ratio of Non-Int. Income to Total Income averaged 6. 70%, with a fall in the first years followed by a clear increase after 2017-18, reaching a peak of 10. 16% in 2020-21. The C. V. of 27% for this ratio suggests some fluctuation in the contribution of non-Int. Income to total income. Non-Int. Income is a smaller part of total income, but its rising share in recent years shows that income is becoming more diverse.

Table 4.24

- **T-Test Paired Two Sample For Means**

(P&S Bank) Ratio 1 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.0588	0.07516
Variance	0.000182585	0.00038597
Observations	5	5
Pearson Correlation	-0.856075349	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-1.14370476	
P(T<=t) one-tail	0.158270662	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.316541323	

t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

The paired t-test for P&S Bank Ratio 1 reveals no statically significant variance between Variable 1 and Variable 2. Both one-tailed (p = 0.158) and two-tailed (p = 0.317) p-values are more than 0.05; therefore, we fail to reject the null hypothesis.

Table 4.25

Ratio of Non-Int. Income to Total Income of All PSBs under Study
(From 2011-12 to 2020-21)
(Ratio in Percentage)

Years	BOB	SBI	BOI	BOM	CBI	Canara Bank	IOB	PNB	Indian Bank	UBOI	Uco Bank	P&S Bank
2011-12	12.74%	23.13%	10.17%	8.79%	7.50%	10.34%	9.19%	11.71%	11.26%	11.02%	7.53%	8.14%
2012-13	11.85%	16.85%	10.39%	8.24%	6.85%	9.15%	8.58%	10.16%	8.90%	9.87%	6.19%	6.05%
2013-14	11.01%	16.25%	10.55%	8.75%	7.11%	8.85%	8.71%	9.08%	8.52%	10.23%	5.38%	5.38%
2014-15	12.07%	16.69%	10.18%	7.05%	7.31%	9.48%	8.89%	9.48%	8.29%	9.65%	6.75%	5.08%
2015-16	10.82%	19.17%	8.92%	7.45%	6.69%	9.75%	8.20%	11.25%	7.97%	10.70%	9.38%	4.75%
2016-17	**11.57%**	**19.32%**	**8.02%**	**7.36%**	**6.96%**	**10.43%**	**9.70%**	**12.07%**	**9.92%**	**10.85%**	**7.92%**	**5.19%**

2017-18	15.14%	22.83%	14.69%	11.22%	13.91%	15.92%	14.60%	38.97%	12.17%	14.19%	0.91%	6.60%
2018-19	14.79%	25.05%	13.24%	12.19%	9.78%	15.18%	17.29%	14.66%	12.37%	14.22%	7.40%	6.81%
2019-20	12.97%	23.29%	11.38%	12.63%	9.60%	13.58%	19.26%	12.38%	8.97%	12.81%	9.55%	8.82%
2020-2021	13.38%	25.50%	13.78%	12.23%	13.27%	19.17%	15.96%	14.59%	13.48%	13.38%	1.21%	10.16%

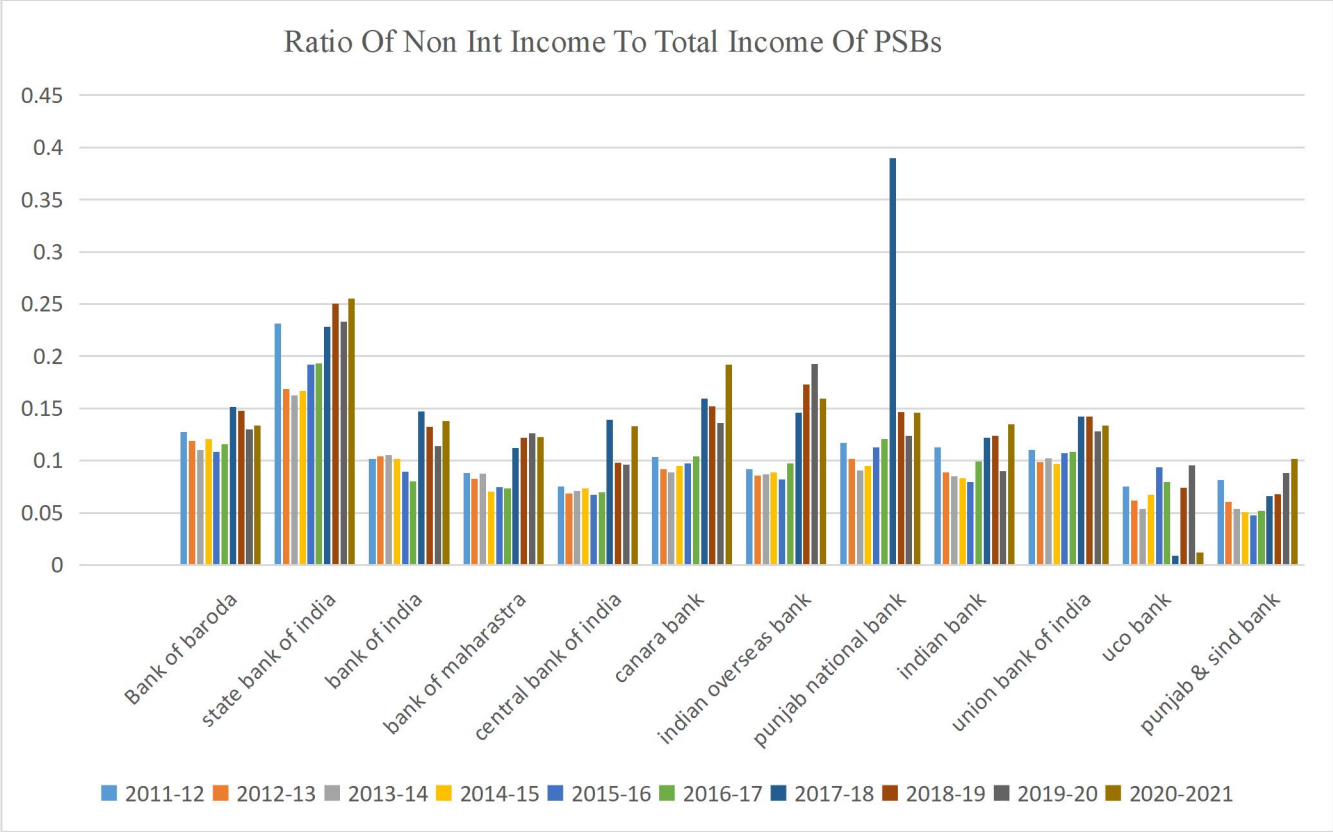
Source: Annual Reports And Accounts Of All Banks For The Period Under Study

Chart 4.1

Ratio of Non-Int. Income to Total Income of All PSBs under Study

(From 2011-12 to 2020-21)

(Ratio in Percentage)



The chart compares the ratio of non-Int. Income to total income for several PSBs in India between 2011–12 and 2020–21. SBI continuously shows the highest non-Int. Income ratios among All banks, which points to a strong diversification in its income streams. PNB shows a notable spike in 2017–18, possibly because of a one-time event that made its ratio go way up above All the others in that year. Over the years, BOB, Union Bank Of India, and Indian Bank have somewhat consistent non-Int. Income ratios. Later years of Canara Bank reveal a clear upward trend reflecting better performance in non-core income sectors. BOI, BOM, and Indian Overseas Bank have modest results with hardly any variation. On the other hand, Central Bank Of India, UCO Bank, and Punjab and Sind Bank usually have the lowest ratios, which indicates a greater reliance on conventional income from interest. The chart generally draws attention to different levels of financial innovation and service diversification among PSBs when it shows different performance patterns in producing non-Int. Income.

- **<u>Two Way Anova Test Is Applied For PSBs Under Study (F Test)</u>**

Two-way F-test has been applied to study impact of demonetization on PSBs with the following hypothesis :

1) **Null Hypothesis (Ho):** Under this study, there is no significant difference in the non-Int. Income to Total income ratio between the banks.

2) **Null Hypothesis (Ho):** Under this study, there is no significant year-wise difference in the non-Int. Income to Total income ratio within the banks

Table 4.26

ANOVA TABLE

Source	Sum	Degree Of Freedom (d.f.)	Variance (Sum/d.f.)	F Ratio
Between Banks(SSC)	0.137	(c-1) = (12-1) =11	0.012	16
Within Banks (SSR)	0.0801	(r-1) = (10-1) = 9	0.0089	11.86
Error (SSE)	0.075	(c-1) (r-1) = 99	0.00075	

Data is calculated by the researcher

1) F Test Between the Banks

V1 = 11, V2 = 99

Table value of F at 5 % level of significance = 1.89

$F = \frac{\text{Higher Variance}}{\text{Smaller Variance}}$ $F = \frac{0.012}{0.00075} = 16$

An F-test was used to contrast the non-Int. Income ratios among several banks in terms of variance. The computed F-value of 16 is more than the table value of 1. 89 at the 5% significance level, given degrees of freedom $V_1 = 11$ and $V_2 = 99$. We reject the null hypothesis and say there is a big difference in the variances of non-Int. Income among the banks because the calculated F is more than the critical value.

2) **F Test Within the Banks**

V1 = 9, V2 = 99

Table value of F at 5 % level of significance = 1.98

$$F = \frac{\text{Higher Variance}}{\text{Smaller Variance}} \qquad F = \frac{0.0089}{0.00075} = 11.86$$

To analyze the change in non-Int. Income throughout time inside each bank, an F-test was performed within the banks. With degrees of freedom $V_1 = 9$ and $V_2 = 99$, the calculated F-value is 11. 86. This is significantly higher than the critical table value of 1. 98 at the 5% significance level. This suggests a statically significant difference in the variance of non-Int. Income among the banks across the years. Therefore, the null hypothesis of equal variances is rejected, suggesting that non-Int. Income has varied significantly over time within individual banks during the study period.

4.6.2 Ratio Of NII To Total Assets Of The Banks Under Study

For the chosen public sector banks, this part examines the ratio of non-interest revenue to total assets to show how well banks produce revenue from non-core operations in relation to their asset base. It offers understanding of banks' attempts at diversification and the degree to which non-interest sources help to support general financial strength outside of conventional lending activities.

Ratio Of NII To Total Assets $= \frac{\text{Non Interest Income}}{\text{Total Assets}} * 100$

In the table below the ratio of the study for All the banks has been shown :

PUBLIC SECTOR BANKS

1) **BOB**

Ratio of NII to total assets of BOB is calculated by the rate of NII of individual year divided by total assets.

Table 4.27

Ratio Of NII To Total Assets Of BOB

(From 2011-12 To 2020-21) (Rs in crores)

Years	Ratio (%)
2011-12	0.89%
2012-13	0.89%

2013-14	0.80%
2014-15	1%
2015-16	0.74%
2016-17	**0.86%**
2017-18	1.10%
2018-19	1.06%
2019-20	0.96%
2020-2021	1.01%
Average	0.91%
S.D.	0.001170992
C.V.%	12.83

Source: Annual Reports And Accounts Of BOB For The Period Under Study

With moderate variation, the ratio of non-interest revenue to total assets for the years 2011–12 to 2020–21 shows a generally consistent contribution of non-Int. Income to the general financial performance of the banks. The proportion varies between 0. 74% and 1. 10%, with the maximum value seen in 2017–18 (1. 10%) and the lowest in 2015–16 (0. 74%). This indicates that although banks have tried to improve their non-interest revenue sources, the proportion of such income streams in relation to overall assets has remained inside a small range. The years 2014–15, 2017–18, 2018–19, and 2020–21 show values above the average, indicating stronger non-core income performance in those periods, possibly due to fee-based services, trading income, or recovery-related gains.

With an average of 0. 91%, less than 1% of the total assets of the banks usually contribute to non-Int. Income. Reflecting little year-to-year change, the standard deviation (S.D) is extremely low at 0. 00117. With a value of 12. 83%, the coefficient of variation (C.V.) further confirms the theory that the ratio is quite consistent over

time. This stability points to a consistent but restricted reliance on non-Int. Income in relation to total assets, therefore highlighting the possibility for more expansion and diversification in non-core banking operations.

Table 4.28

- **T-Test Paired Two Sample For Means**

(RATIO 2 BOB) T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.00828	0.00998
Variance	0.000000407	8.72E-07
Observations	5	5
Pearson Correlation	-0.198073584	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-3.088357783	
P(T<=t) one-tail	0.01831636	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.036632721	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

The paired t-test for BOB Ratio 2 shows a statically significant divergence between Variable 1 and Variable 2. Reject the null hypothesis since the one-tailed p-value (0.0183) is less than 0.05, therefore indicating a substantial elevation of Variable 2. Significant too is the two-tailed test (p = 0.0366).

2) **SBI**

To find the ratio of non-Int. Income to Total Assets of SBI, the calculation method is the rate of Non-Int. Income of individual year divided by Total Assets of SBI.

Table 4.29

Ratio Of NII To Total Assets Of SBI

(From 2011-12 To 2020-21) (Rs in crores)

Years	Ratio (%)
2011-12	2.07%
2012-13	1.62%
2013-14	1.52%
2014-15	2%
2015-16	1.82%
2016-17	**1.71%**
2017-18	1.97%
2018-19	2.14%
2019-20	1.97%
2020-2021	2.33%
Average	1.87%
S.D.	0.002670019
C.V.%	14.26

Source: Annual Reports And Accounts Of SBI For The Period Under Study

The ratio of non-Int. Income to total assets between 2011–12 and 2020–21 suggests a moderate but significant contribution of non-core operations to the general financial results of the banks under investigation. With the lowest ratio of 1. 52% in 2013–14 and the highest of 2. 33% in 2020–21, the values range from 1. 52% to 2. 33%. The upward trend seen in the latter years, especially from 2018–19 onward, indicates that banks are increasingly focusing on income from fees, commissions, trading, and other activities other than lending. Above-average ratios in 2011–12, 2014–15, 2018–19, and 2020–21 suggest better performance in using All assets to produce non-interest revenue.

With an average ratio of 1. 87% over the ten years, non-interest revenue always made up a modest but significant part of overall asset utilization. With a standard deviation

of 0. 00267 and a coefficient of variation (C.V.) of 14. 26%, the ratio shows reasonable fluctuation over time. This implies that although the general trend is consistent, there were sometimes variations probably brought about by changes in legislation, economic circumstances, or bank policies. The evidence points to a progressive increase in banks' capacity to produce non-interest revenue, therefore emphasizing the changing emphasis on varied income sources outside of conventional interest-based activities.

Table 4.30

- **T-Test Paired Two Sample For Means**

(RATIO 2 SBI) T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.01722	0.02024
Variance	0.000005052	5.29E-06
Observations	5	5
Pearson Correlation	-0.43309154	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-1.75433208	
P(T<=t) one-tail	0.07711698	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.15423396	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

With p-values of 0.0771 for one-tailed and 0.1542 for two-tailed, the paired t-test for SBI Ratio 2 reveals no statically significant difference between Variable 1 and Variable 2; so, we reject the null hypothesis.

3) **BOI**

To find the ratio of non-Int. Income to Total Assets of BOI, the calculation method is the rate of Non-Int. Income of individual year divided by Total Assets of BOI. The ratio has been shown in the table below;

Table 4.31
Ratio Of NII To Total Assets Of BOI
(From 2011-12 To 2020-21) (Rs in crores)

Years	Ratio (%)
2011-12	0.74%
2012-13	0.85%
2013-14	0.82%
2014-15	0.74%
2015-16	0.68%
2016-17	**0.59%**
2017-18	1.07%
2018-19	0.95%
2019-20	0.83%
2020-2021	1.02%
Average	0.83%
S.D.	0.001508826
C.V.%	18.2

Source: Annual Reports And Accounts Of BOI For The Period Under Study

For the years 2011–12 through 2020–21, the ratio of non-Int. Income to total assets indicates a usually modest but variable contribution of non-core income sources to the banks' general financial composition. The ratio ranges from a low of 0. 59% in 2016–17 to a peak of 1. 07% in 2017–18, showing a sudden spike likely due to an increase in fee-based income, commission, or recoveries in that year. The early years, especially 2011–12 to 2015–16, show relatively lower and stable ratios, suggesting

limited efforts or ability of the banks to generate non-Int. Income during that time. From 2017–18 on, there is a clear rise; the ratios remain above average, which points to a possible strategic change towards income stream diversification.

The average ratio over the decade is 0. 83%, which signifies that non-Int. Income accounted for a small portion of total assets on average. The standard deviation (S. D.) is 0. 00151, indicating some variation, and the coefficient of variation (C. V.) is 18. 2%, which reflects a moderate level of inconsistency in the ratio across the years. This variability suggests that while banks have made progress in enhancing non-Int. Income in certain years, the performance remains somewhat inconsistent. The data overall reflects limited but improving utilization of total assets for generating non-Int. Income, pointing to an area where banks may focus further for financial resilience.

Table 4.32

- **T-Test Paired Two Sample For Means**

RATIO 2 BOI T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.00766	0.00892
Variance	4.68E-07	3.66E-06
Observations	5	5
Pearson Correlation	0.315859117	
Hypothesized Mean Difference	0	
df	4	
t Stat	-1.550248288	
P(T<=t) one-tail	0.098008497	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.196016995	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

For SBI Ratio 2, the paired t-test reveals no statically significant variation between Variable 1 and Variable 2. Since both the one-tailed (p = 0.0980) and two-tailed (p = 0.1960) p-values are greater than 0.05, we fail to reject the null hypothesis.

4) <u>BOM</u>

To find the ratio of non-Int. Income to Total Assets of BOM, the calculation method is the rate of Non-Int. Income of individual year divided by Total Assets of BOM. The ratio has been shown in the table below:

Table 4.33

Ratio Of NII To Total Assets Of BOM
(From 2011-12 To 2020-21) (Rs in crores)

Years	Ratio (%)
2011-12	0.69%
2012-13	0.72%
2013-14	0.78%
2014-15	0.65%
2015-16	0.68%
2016-17	**0.63%**
2017-18	0.95%
2018-19	0.98%
2019-20	0.94%
2020-2021	0.97%
Average	0.80%
S.D.	0.001445645
C.V.%	18.09

Source: Annual Reports And Accounts Of The BOM For Under Period Study

From 2011–12 to 2020–21, the ratio of non-Int. Income to total assets shows a progressive increase in the banks' capacity to produce revenue from non-core activities in comparison to their asset base. The ratios stayed fairly low and constant in the early part of the decade (2011–12 to 2016–17), between 0. 63% and 0. 78%, showing a small focus or reduced returns from non-Int. Income including fees, commissions, and other services. Beginning in 2017–18,

though, a clear upward trend starts as the ratio reaches 0. 95% and keeps improving to peak at 0. 98% in 2018–19, and then stays high throughout 2020–21. This change points to a deliberate move by the banks to diversify revenue streams, perhaps in reaction to falling interest margins or legal changes.

With an average ratio of 0. 80% for the 10-year period, non-Int. Income only modestly contributes to overall assets. The standard deviation (S. D.) of 0. 00145 indicates that, even though there are year-to-year variations, they are not drastic. With 18. 09% variation coefficient (C.V.), which indicates a modest level of volatility throughout the years, the data generally suggests a positive trend in recent years. overall, the data shows that banks are progressively using their assets to boost income from non-lending operations, hence improving financial diversification, even if the base of non-Int. Income is still somewhat low.

Table 4.34

- **T-Test Paired Two Sample For Means**

(RATIO 2 BOM) T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.00704	0.00894
Variance	0.000000243	2.2E-06
Observations	5	5
Pearson Correlation	0.23303116	
Hypothesized Mean Difference	0	
df	4	
t Stat	-2.928279675	
P(T<=t) one-tail	0.021443686	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.042887372	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

The paired t-test for BOM Ratio 2 reveals a statically significant variation between Variable 1 and Variable 2. Since both the one-tailed (p = 0.0214) and two-tailed (p = 0.0429) p-values are below 0.05, we deny the null hypothesis, suggesting that Variable 2 is much above Variable 1.

5) Central Bank Of India

To find the ratio of non-Int. Income to Total Assets of Central Bank Of India, the calculation method is the rate of Non-Int. Income of individual year divided by Total Assets of Central Bank Of India. The ratio has been shown in the table below:

Table 4.35

Ratio Of NII To Total Assets Of Central Bank Of India

(From 2011-12 To 2020-21) (Rs in crores)

Years	Ratio (%)
2011-12	0.60%
2012-13	0.60%
2013-14	0.62%
2014-15	0.66%
2015-16	0.60%
2016-17	**0.63%**
2017-18	0.86%
2018-19	0.80%
2019-20	0.72%
2020-2021	1.01%
Average	0.71%
S.D.	0.001390444
C.V.%	19.58

Source: Annual Reports And Accounts Of CBI For The Period Under Study

From 2011–12 to 2020–21, the ratio of non-Int. Income to total assets reveals a modest upward trend, especially in the later part of the decade. In the early years (2011–12 to 2016–17), the ratio stayed somewhat constant between 0. 60% and 0. 66%, showing that non-Int. Income was a minor but reliable source of income for the banks' total asset performance. From 2017–18 onwards, however, there

was a clear upswing as the ratio rose to 0. 86%, 0. 80%, and finAll y hit a peak of 1. 01% in 2020–21. This rise shows that banks are working harder to boost income from non-core activities including commissions, fees, and investment-related income.

With an average ratio of 0. 71% across the ten-year period, non-Int. Income contributes quite little to total assets. The standard deviation (S.D.) of 0. 00139 indicates moderate year-to-year variation; the coefficient of variation (C.V.) of 19. 58% emphasizes strong relative change in the data. This variation suggests that while banks have lately begun concentrating more on non-Int. Income, the growth has been uneven. generally, the data reveals a positive trend in non-Int. Income generation, but it also highlights the necessity of constant policies to stabilize and boost this income stream over time.

Table 4.36

- **T-Test Paired Two Sample For Means**

(Central Bank) Ratio 2 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.00616	0.00804
Variance	6.8E-08	2.073E-06
Observations	5	5
Pearson Correlation	-0.340922655	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-2.715243823	
P(T<=t) one-tail	0.026623918	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.053247835	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

Because the paired t-test for Central Bank Ratio 2 reveals a statically significant difference in the one-tailed test ($p = 0.0266 < 0.05$), we reject the null hypothesis, hence showing Variable 2 is substantially greater. But the two-tailed test is not significant ($p = 0.0532 > 0.05$), which implies the outcome relies on the direction of the assumption.

6) Canara Bank

To find the ratio of non-Int. Income to Total Assets of Canara Bank, the calculation method is the rate of Non-Int. Income of individual year divided by Total Assets of Canara Bank. The ratio has been shown in the table below

Table 4.37
Ratio Of NII To Total Assets Of Canara Bank
(From 2011-12 To 2020-21) (Rs in crores)

Years	Ratio (%)
2011-12	0.83%
2012-13	0.81%
2013-14	0.78%
2014-15	0.82%
2015-16	0.84%
2016-17	**0.91%**
2017-18	1.31%
2018-19	1.17%
2019-20	1.39%
2020-2021	1.59%
Average	1.05%
S.D.	0.002952306

C.V.%	28.25

Source: Annual Reports And Accounts Of Canara Bank For The Period Under Study

From 2011–12 to 2020–21, the ratio of non-Int. Income to total assets clearly shows an upward trend, especially in the second part of the time frame. The ratio stayed fairly consistent between 0. 78% and 0. 84% from 2011–12 to 2015–16, showing a small but consistent contribution of non-Int. Income to general asset use. Starting in 2016–17, however, there is a notable rise as the ratio rises abruptly to 0. 91% and reaches 1. 59% in 2020–21. This rise implies that the banks have concentrated more and more on making money from things other than their main business, like service charges, commissions, treasury activities, and other ways to make money from fees.

With 1. 05%, the average ratio over the decade is more than that of many competitors, which suggests a greater reliance on non-interest revenue in relation to total assets. With a high coefficient of variation (C.V.) of 28. 25% and a standard deviation (S.D.) of 0. 00295, the ratio shows significant year-to-year volatility. This points to the possibility that, despite notable development in income source diversification by the banks, the expansion may have been uneven and impacted by outside economic

events, legal changes, or internal policy changes. Although with significant variations that demand continuous and deliberate initiatives to keep consistency, the data generally shows a good and significant rise in non-Int. Income production.

Table 4.38

- **T-Test Paired Two Sample For Means**

(Canara Bank) Ratio 2 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.00816	0.01274
Variance	0.000000053	0.000006448
Observations	5	5
Pearson Correlation	0.277117891	
Hypothesized Mean Difference	0	
df	4	
t Stat	-4.120611588	
P(T<=t) one-tail	0.007302579	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.014605157	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

The paired t-test for Canara Bank Ratio 2 reveals a statically significant difference between Variable 1 and Variable 2. Rejection of the null hypothesis—i.e., Variable 2 is significantly higher than Variable 1—is possible because both the one-tailed ($p = 0.0073$) and two-tailed ($p = 0.0146$) p-values are below 0.05.

7) **Indian Bank**

To find the ratio of non-Int. Income to Total Assets of Indian Bank, the calculation method is the rate of Non-Int. Income of individual year divided by Total Assets of Indian Bank. The ratio has been shown in the table below:

Table 4.39

Ratio Of NII To Tota Assets Of Indian Bank

(From 2011-12 To 2020-21) (Rs in crores)

Years	Ratio (%)
2011-12	0.97%
2012-13	0.88%
2013-14	0.79%
2014-15	0.73%
2015-16	0.71%
2016-17	**0.87%**
2017-18	1.01%
2018-19	0.95%
2019-20	0.61%
2020-2021	1.07%
Average	0.86%
S.D.	0.001468522
C.V.%	17.09

Source: Annual Reports And Accounts Of Indian Bank For The Period Under Study

The data on the ratio of non-Int. Income to total assets for the period 2011–12 to 2020–21 reveals a moderate yet fluctuating trend in the banks' ability to generate non-core income relative to their asset base. From 0. 97% in 2011–12 to 0. 71% in 2016–17, the ratio decreased—showing a drop in non-Int. Income contribution. But a comeback starts in 2016–17, with the ratio reaching 1. 01% in 2017–18 and then again peaking at 1. 07% in 2020–21. These developments could point to the banks' attempts to increase non-Int. Income by means of better fee-based services, commissions, or treasury activities.

The average ratio over the ten-year span is 0. 86%, suggesting a modest overall contribution of non-Int. Income to total assets. Moderate volatility across the years is indicated by a standard deviation (S. D.) of 0. 00147 and a coefficient of variation (C. V.) of 17. 09%. While there is some inconsistency, the data shows that the banks have periodically improved their performance in non-Int. Income, particularly in the later

years. Though there is still room for more consistency and strategic focus to maintain these gains over time, this shows an increasing awareness of the need of income diversification.

Table 4.40

- **T-Test Paired Two Sample For Means**

(Indian Bank) Ratio 2 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.00816	0.00902
Variance	0.000001178	3.21E-06
Observations	5	5
Pearson Correlation	0.103332192	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-0.96295475	
P(T<=t) one-tail	0.195050705	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.390101411	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

The paired t-test for Indian Bank Ratio 2 indicates that there is no meaningful statistical difference between Variable 1 and Variable 2. The one-tailed (p = 0. 1951) and two-tailed (p = 0. 3901) p-values both exceed 0. 05, leading us to not reject the null hypothesis.

8) **Indian Overseas Bank**

To find the ratio of non-Int. Income to Total Assets of Indian Overseas Bank, the calculation method is the rate of Non-Int. Income of individual year divided by Total Assets of Indian Overseas Bank. The ratio has been shown in the table below:

Table 4.41

Ratio Of NII To Total Assets Of Indian Overseas Bank

(From 2011-12 To 2020-21) (Rs in crores)

Years	Ratio (%)
2011-12	0.68%
2012-13	0.76%
2013-14	0.80%
2014-15	0.78%
2015-16	0.74%
2016-17	**0.92%**
2017-18	1.36%
2018-19	1.51%
2019-20	1.68%
2020-2021	1.28%
Average	1.05%
S.D.	0.003692169
C.V.%	35.13

Source: Annual Reports And Accounts Of Indian Overseas Bank For The Period Under Study

The provided data shows the year-wise ratio (in percentage) of a particular financial indicator—likely related to banking performance—over the period 2011-12 to 2020-21. From 0. 68% in 2011–12 to 1. 68% in 2019–20, the ratio has progressively grown over time. This upward trend suggests a consistent improvement in the indicator, possibly due to better financial management, diversification of income sources, or policy reforms during the decade. From 2016–17 to 2019–20, the greatest growth was seen, suggesting a phase of fast performance followed by a minor drop in 2020–21 to 1. 28%.

The average ratio over ten years, 1. 05%, indicates a medium level of performance. With a standard deviation (S.D.) of 0. 0037, the year-to-year changes are quite small in absolute values. However, at 35. 13%, the coefficient of variation (C.V.) suggests a fair amount of relative variance in the data. A C. V. of more than 30% usually points to significant variance in the performance indicator. This suggests that while the overall trend is upward, the pace of growth was not uniform and experienced moderate variation across the years.

Table 4.42

- **T-Test Paired Two Sample For Means**

(Indian Ov. Bank) Ratio 2 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.00752	0.0135
Variance	0.000000212	0.00000811
Observations	5	5
Pearson Correlation	0.930425218	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-5.513452992	
P(T<=t) one-tail	0.002640675	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.005281351	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

The paired t-test conducted for Indian Overseas Bank Ratio 2 reveals a highly significant disparity between Variable 1 and Variable 2. The one-tailed (p = 0. 0026) and two-tailed (p = 0. 0053) p-values are both considerably lower than 0. 05, leading

us to dismiss the null hypothesis, which suggests that Variable 2 is significantly greater than Variable 1.

9) PNB

To find the ratio of non-Int. Income to Total Assets of PNB, the calculation method is the rate of Non-Int. Income of individual year divided by Total Assets of PNB. The ratio has been shown in the table below:

Table 4.43

Ratio Of NII To Total Assets Of PNB
(From 2011-12 To 2020-21) (Rs in crores)

Years	Ratio (%)
2011-12	0.94%
2012-13	0.90%
2013-14	0.86%
2014-15	0.81%
2015-16	0.97%
2016-17	**0.97%**
2017-18	1.25%
2018-19	1.14%
2019-20	0.93%
2020-2021	1.10%
Average	0.99%
S.D.	0.001359779
C.V.%	13.77

Source: Annual Reports And Accounts Of PNB For The Period Under Study

The provided data shows the year-wise ratio (%) for a particular financial metric over ten years, from 2011–12 to 2020–21. Starting at 0. 94% in 2011–12, the ratio peaks at 1. 25% in 2017–18, showing an overall upward trend with some variation. Particularly,

there is a decrease from 2013–14 to 2014–15, then a rebound and continuous growth from 2016–17 on. The rise after 2015–16 points to a good change in the underlying element, maybe operational efficiency or a growth in income from particular revenue streams.

With a low standard deviation of 0. 00136 indicating little absolute change across the years, the mean ratio across the ten years is 0. 99%. With a coefficient of variation (C.V.) of 13. 77%, this indicator shows little relative variability, implying its performance has been rather consistent across time. A C. V. below 20% usually points to consistency and reliability in performance; this financial metric stayed well-controlled with just slight fluctuations throughout the period. This constancy can either indicate competent fiscal management or a stable macroeconomic environment affecting the ratio.

Table 4.44

- **T-Test Paired Two Sample For Means**

(Punjab Bank) Ratio 2 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.00896	0.01078
Variance	0.000000403	1.687E-06
Observations	5	5
Pearson Correlation	0.244379621	
Hypothesized Mean Difference	0	
Df	4	
T Stat	-3.13327742	
P(T<=T) One-Tail	0.017537108	
T Critical One-Tail	2.131846786	
P(T<=T) Two-Tail	0.035074215	
T Critical Two-Tail	2.776445105	

Data Is Calculated By Researcher

Decision :

The paired t-test for Punjab Bank Ratio 2 indicates a notable statistical difference between Variable 1 and Variable 2. Since the one-tailed (p = 0. 0175) and two-tailed (p = 0. 0351) p-values are both below 0. 05, we dismiss the null hypothesis, suggesting that Variable 2 is meaningfully greater than Variable 1.

10) Union Bank Of India

To find the ratio of non-Int. Income to Total Assets of Union Bank Of India, the calculation method is the rate of Non-Int. Income of individual year divided by Total Assets of Union Bank Of India . The ratio has been shown in the table below:

Table 4.45

Ratio Of NII To Total Assets Of Union Bank Of India

(From 2011-12 To 2020-21) (Rs in crores)

Years	Ratio (%)
2011-12	0.86%
2012-13	0.88%
2013-14	0.91%
2014-15	0.88%
2015-16	1.03%
2016-17	**0.96%**
2017-18	1.19%
2018-19	1.11%
2019-20	1.01%
2020-2021	1.04%
Average	0.99%
S.D.	0.001091431
C.V.%	11.06

Source: Annual Reports And Accounts Of Union Bank Of India For The Period Under Study

The given figures show the year-by-year ratio (%) of a financial metric from 2011–12 to 2020–21. Starting at 0. 86% in 2011–12 and reaching a maximum of 1. 19% in

2017–18, the ratio follows a slow increasing pattern. Significant gains are seen after 2014–15, pointing to higher income efficiency or better financial performance in following years. The data from 2015–16 onwards indicate continuous improvement and perhaps changes in policy or operations that positively affected performance; they stay consistently above 1% (with small swings).

With an average ratio of 0. 99% over the decade, performance is generally good. At 0. 00109, the standard deviation is low, showing very little absolute fluctuation. More significantly, the ten-year period's (C.V.)of 11. 06% shows great consistency and stability in the ratio.(C.V.) under 20% generally indicates great control over the financial element being assessed, implying that the institution or industry kept a consistent and effective method of handling this indicator, which helps to ensure constant development and dependability.

Table 4.46

- **T-Test Paired Two Sample For Means**

(Union Bank) Ratio 2 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.00912	0.01062
Variance	0.000000467	8.07E-07
Observations	5	5
Pearson Correlation	0.007330225	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-2.982160397	
P(T<=t) one-tail	0.020325952	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.040651904	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision

The paired t-test results for Union Bank Ratio 2 indicate a meaningful difference between Variable 1 and Variable 2. Since the one-tailed p-value (p = 0. 0203) and the two-tailed p-value (p = 0. 0407) are both below 0. 05, we dismiss the null hypothesis, which suggests that Variable 2 is notably greater than Variable 1.

11) UCO Bank

To find the ratio of non-Int. Income to Total Assets of UCO Bank , the calculation method is the rate of Non-Int. Income of individual year divided by Total Assets of UCO Bank. The ratio has been shown in the table below:

Table 4.47
Ratio Of NII To Total Assets Of UCO Bank
(From 2011-12 To 2020-21) (Rs in crores)

Years	Ratio (%)
2011-12	0.56%
2012-13	0.53%
2013-14	0.47%
2014-15	0.55%
2015-16	0.81%
2016-17	**0.65%**
2017-18	0.91%
2018-19	0.51%
2019-20	0.65%
2020-2021	1.21%
Average	0.69%
S.D.	0.002307115
C.V.%	33.68

Source: Annual Reports And Accounts Of UCO For The Period Under Study

Over the decade, the data reveals a changing trend in the year-wise ratio (%) of a financial indicator from 2011–12 to 2020–21. The ratio stayed below or about 0. 55% from 2011-12 to 2014-15, then rose sharply to 0. 81% in 2015-16 and continued to vary in the years that followed. 2020–2021 sees a noticeable peak of 1. 21%, which

might point to the effects of deliberate policy changes, economic developments, or one-time events such post-demonetization effects or COVID-19-related adjustments. Though sometimes increasing, the trend lacks steady year-on-year improvement.

The ten-year average ratio of 0. 69% suggests a modest level of performance. But the fact that the standard deviation is 0. 00231 and the coefficient of variation (C.V.) is 33. 68% indicates that the data has a lot of variability compared to each other. (C.V.) more than 30% suggests that the ratio has been erratic and has shown great year-to-year variations. This could indicate difficulties maintaining performance, unreliable income streams, or outside financial stresses affecting the financial indicator. overall, despite some indications of development, the inconsistency emphasizes the need of more consistent and organized financial management.

Table 4.48

- **T-Test Paired Two Sample For Means**

(Uco Bank) Ratio 2 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.00584	0.00786
Variance	0.000001718	7.708E-06
Observations	5	5
Pearson Correlation	0.882659305	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-2.60693995	
P(T<=t) one-tail	0.029805698	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.059611397	

t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

The paired t-test results for UCO Bank Ratio 2 indicate a meaningful difference in the one-tailed test (p = 0. 0298 < 0. 05), suggesting that the outcome is influenced by the hypothesis's direction.

12) P&S Bank

To find the ratio of non-Int. Income to Total Assets of P&S Bank , the calculation method is the rate of Non-Int. Income of individual year divided by Total Assets of Punjab & Sind Bank. The ratio has been shown in the table below:

Table 4.49
Ratio Of NII To Total Assets Of P&S Bank
(From 2011-12 To 2020-21) (Rs in crores)

Years	Ratio (%)
2011-12	0.63%
2012-13	0.57%
2013-14	0.51%
2014-15	0.45%
2015-16	0.43%
2016-17	**0.46%**
2017-18	0.59%
2018-19	0.51%
2019-20	0.76%
2020-2021	0.89%
Average	0.58%
S.D.	0.001471205

C.V.%	25.37

Source: Annual Reports And Accounts Of P & S Bank For The Period Under Study

The information given shows the ratio (%) of a financial indicator across ten years, from 2011-12 to 2020-21. Originally reflecting a steady decrease, the trend declined from 0. 63% in 2011–12 toa low of 0. 43% in 2015–16. But from 2016–17 on, there's a significant rebound, the ratio rising steadily and hitting 0. 89% by 2020–21. This turnaround points to either higher financial results or better management techniques in the second part of the decade. Rising sharply in the last two years could also point to the effects of policy changes, more efficiency, or changes in income streams in a volatile economy.

The average percentage for the decade is 0. 58%, suggesting a decent degree of performance. With a coefficient of variation (C.V.) of 25. 37% and a standard deviation of 0. 00147, the data show moderate relative variability. The early years of deterioration followed by abrupt improvement indicate times of both volatility and recovery even if the (C.V.) is under 30%, which points to a fair degree of consistency. Financial activities are in a state of transition, as reflected in this trend. The latter years show encouraging advances that may lay the groundwork for ongoing stability and expansion going forward.

Table 4.50

- **T-Test Paired Two Sample For Means**

(P&S Bank) Ratio 2 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.00518	0.00642
Variance	0.000000692	3.217E-06
Observations	5	5
Pearson Correlation	-0.869283424	
Hypothesized Mean Difference	0	

Df	4	
t Stat	-1.087301057	
P(T<=t) one-tail	0.169017894	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.338035787	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

The paired t-test conducted for the P&S Bank Ratio 2 reveals that there is no noteworthy statistical difference between Variable 1 and Variable 2. The p-values for both the one-tailed (p = 0. 1690) and two-tailed (p = 0. 3380) tests exceed 0. 05, leading us to retain the null hypothesis.

Table 4.51

Ratio of Non-Int. Income to Total Assets of All PSBs under Study

IMPACT OF DEMONETIZATION ON NON FUND BASE INCOME OF PUBLIC SECTOR BANKS IN INDIA

(From 2011-12 to 2020-21)

(Ratio in Percentage)

Years	BOB	SBI	BOI	BOM	CBI	Canara Bank	IOC	PNB	Indian Bank	Union Bank Of India	Uco Bank	P &S Bank
2011-12	12.74%	23.13%	10.17%	8.79%	7.50%	10.34%	9.19%	11.71%	11.26%	11.02%	7.53%	8.14%
2012-13	11.85%	16.85%	10.39%	8.24%	6.85%	9.15%	8.58%	10.16%	8.90%	9.87%	6.19%	6.05%
2013-14	11.01%	16.25%	10.55%	8.75%	7.11%	8.85%	8.71%	9.08%	8.52%	10.23%	5.38%	5.38%
2014-15	12.07%	16.69%	10.18%	7.05%	7.31%	9.48%	8.89%	9.48%	8.29%	9.65%	6.75%	5.08%
2015-16	10.82%	19.17%	8.92%	7.45%	6.69%	9.75%	8.20%	11.25%	7.97%	10.70%	9.38%	4.75%
2016-17	**11.57%**	**19.32%**	**8.02%**	**7.36%**	**6.96%**	**10.43%**	**9.70%**	**12.07%**	**9.92%**	**10.85%**	**7.92%**	**5.19%**
2017-18	15.14%	22.83%	14.69%	11.22%	13.91%	15.92%	14.60%	38.97%	12.17%	14.19%	19.58%	6.60%
2018-19	14.79%	25.05%	13.24%	12.19%	9.78%	15.18%	17.29%	14.66%	12.37%	14.22%	7.40%	6.81%
2019-20	12.97%	23.29%	11.38%	12.63%	9.60%	13.58%	19.26%	12.38%	8.97%	12.81%	9.55%	8.82%
2020-2021	13.38%	25.50%	13.78%	12.23%	13.27%	19.17%	15.96%	14.59%	13.48%	13.38%	15.95%	10.16%

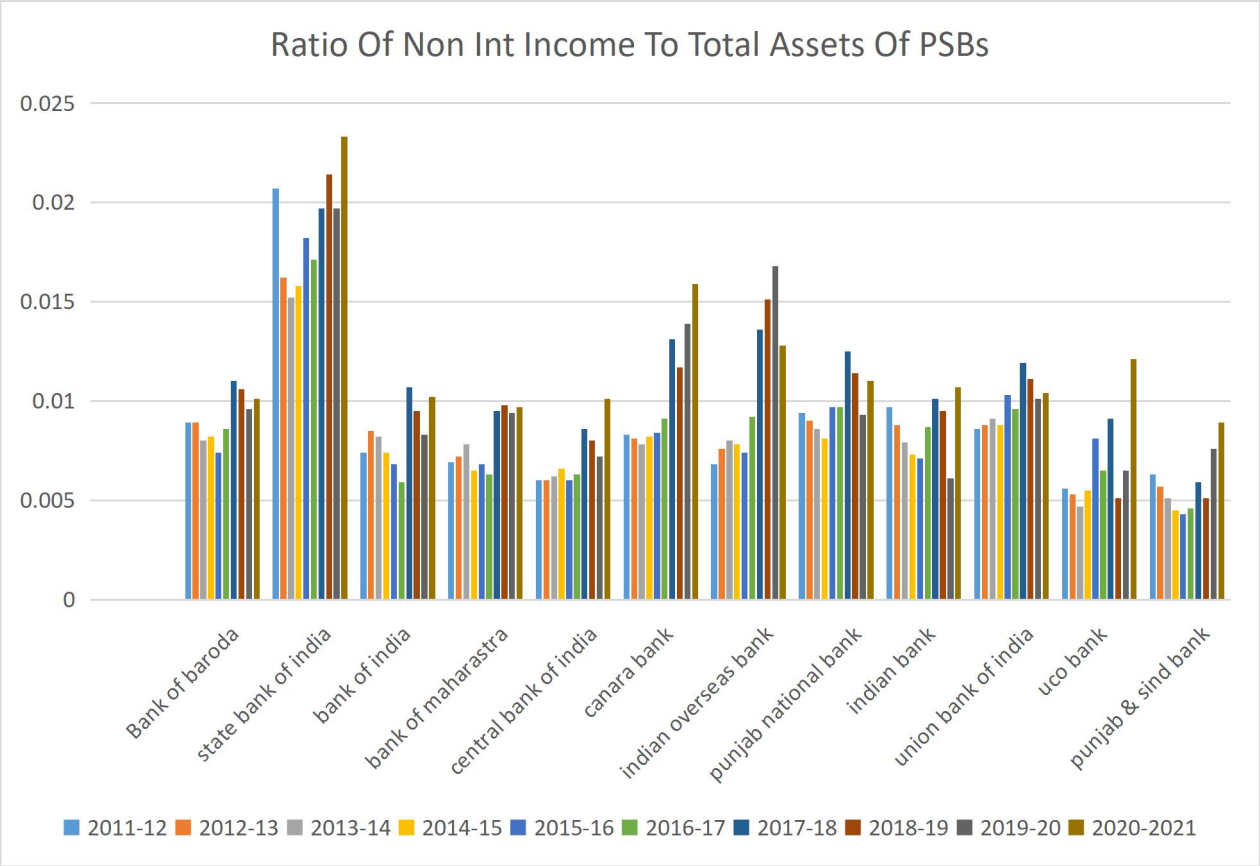
Source: Annual Reports And Accounts Of All Banks For The Period Under Study

Chart 4.2

Ratio of Non-Int. Income to Total Assets of All PSBs under Study

(From 2011-12 to 2020-21)

(Ratio in Percentage)



Based on a particular financial ratio—most likely connected to non-Int. Income as a percentage of total income—the bar graph shows the year-wise performance of several PSBs in India from 2011–12 to 2020–21. The data reveals clear patterns between banks and time frames even if the graph lacks a title and marked axes. Among the banks, BOI stands out with regularly better ratio values, particularly hitting a peak in 2020–21, which points to a robust and expanding performance in the chosen financial sphere. Likewise, recent years have seen significant development at PNB and Indian Overseas Bank, indicating increased income diversification or successful financial changes.

On the other hand, banks like Central Bank Of India, UCO Bank, and Punjab and Sind Bank have significantly lower ratios over the decade, which points to more modest performance or little income source diversification. Many banks show an overall positive trend following 2016–17, possibly as a result of banking industry

changes, digitization, and the effects of demonetization. This diversity among banks points out several degrees of efficiency, agility, and strategic orientation present throughout the industry. The chart generally emphasizes the advancement of some universities while others continue to struggle in increasing their financial results.

- **Two Way Anova Test Is Applied For PSBs Under Study (F Test)**

Two-way F-test has been applied to study impact of demonetization on PSBs with the following hypothesis :

1) **Null Hypothesis (Ho):** Under this study, there is no significant difference in the non-Int. Income to Total Assets ratio between the banks.

2) **Null Hypothesis (Ho):** Under this study, there is no significant year-wise difference in the non-Int. Income to Total Assets ratio within the banks

Table 4.52

ANOVA TABLE

Source	Sum	Degree Of Freedom (d.f.)	Variance (Sum/d.f.)	F Ratio
Between Banks(SSC)	0.0012	(c-1) = (12-1) =11	0.00010	5.26
Within Banks (SSR)	0.0025	(r-1) = (10-1) = 9	0.00028	14.73
Error (SSE)	0.0019	(c-1) (r-1) = 99	0.000019	

Data is calculated by the researcher

1) **F Test Between the Banks**

V1 = 11, V2 = 99

Table value of F at 5 % level of significance = 1.89

$$F = \frac{\text{Higher Variance}}{\text{Smaller Variance}} \qquad F = \frac{0.00010}{0.000019} = 5.26$$

With degrees of freedom V_1 = 11 and V_2 = 99, the F-test was carried out to examine the variances between two groups of bank data. At the 5% level of significance, the

computed F-value of 5. 26 is much greater than the table value of 1. 89. We reject the null hypothesis of equal variances as the determined F-value surpasses the critical value. This suggests inconsistent performance or different financial behaviors throughout the compared datasets, as the variability between the two bank groups is rather large.

2) F Test Within the Banks

V1 = 9, V2 = 99

Table value of F at 5 % level of significance = 1.98

$$F = \frac{\text{Higher Variance}}{\text{Smaller Variance}} \qquad F = \frac{0.00028}{0.000019} = 14.73$$

The F-test the banks did examines the same set of banks' variances across several years. At the 5% level of significance, the computed F-value is 14. 73, which is much higher than the table value of 1. 98. Degrees of freedom $V_1 = 9$ and $V_2 = 99$. We reject the null hypothesis of equal variances as the derived F surpasses the critical value. This implies that the banks have shown a major variation in performance year to year, which means their financial ratios have not stayed the same over time and have changed a lot.

4.6.3 Ratio Of NII To Investment Of The Banks Under Study

This ratio gauges the ratio of a bank's overall investments to its non-Int. Income. It's a crucial sign of how well a bank is using its investments to produce revenue outside of the usual Int. Income. A larger ratio indicates better efficiency in producing fee-based or other non-fund revenue sources and greater diversity. To assess their success in using investments for non-Int. Income generation, this section examines and contrasts this ratio among the chosen banks.

$$\textbf{Ratio Of NII To Total Assets} = \frac{\text{Non Interest Income}}{\text{Investment}} * 100$$

In the table below the ratio of the study for All the banks has been shown :

PUBLIC SECTOR BANKS

1) BOB

Ratio of NII to Investment of BOB is calculated by the rate of NII of individual year divided by Investment.

Table 4.53

Ratio Of NII To Investment Of BOB

(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Investment	Ratio(%)
2011-12	3287.1	74154.42	4.43%
2012-13	4100.42	86697	4.73%
2013-14	4510.62	125617.05	3.59%
2014-15	5555.15	122112.86	4.55%
2015-16	5449.27	130246.45	4.18%
2016-17	**5992.17**	**128894**	**4.65%**
2017-18	7936.78	140716.43	5.64%
2018-19	7992.21	175132.23	4.56%
2019-20	7887.05	195716.24	4.03%
2020-21	12191.33	289726.72	4.20%
Average	6490.21	146901.34	4.46%
S.D.	2601.243797	61646.8763	0.005383142
C.V.%	40.79	41.96	12.09

Source: Annual Reports And Accounts Of BOB For The Period Under Study

Over the ten-year period from 2011–12 to 2020–21, the Non-Int. Income to Investment ratio for the bank under review swung somewhat. The ratio varied from a low of 3. 59% in 2013–14 to a high of 5. 64% in 2017–18, with an average of 4. 46%. This shows that, on average, fees, commissions, and trading profits from the bank

accounted for around 4. 46% of its investment value. The ratio did not consistently rise even though both non-interest revenue and overall investments have grown over time. This indicates that development in investment did not always equal corresponding growth in non-Int. Income.

Further emphasize the variance in performance are the statistical indicators. At 12. 09%, the coefficient of variation (C. V.) for the ratio is somewhat low in comparison to the C. V. of non-interest revenue (40. 79%) and investments (41. 96%). This implies that, while investment levels and non-Int. Income both fluctuated greatly, their ratio stayed somewhat more consistent. Although the components vary, the bank seems to have kept a reasonably constant capacity to produce non-Int. Income from its investment portfolio. This stability in the ratio points to moderate efficiency and consistent performance in using investments to produce varied income.

Table 4.54

- **T-Test Paired Two Sample For Means**

(RATIO 3- BOB) t-Test: Paired Two Sample for Means		
	Variable 1	**Variable 2**
Mean	0.04296	0.04616
Variance	0.000019568	3.92E-05
Observations	5	5
Pearson Correlation	0.350012215	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-1.139880475	
P(T<=t) one-tail	0.158979074	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.317958149	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

The paired sample t-test for BOB contrasts two linked variables with mean values of 0. 04296 and 0. 04616. With 4 degrees of freedom, the computed t-statistic is -1. 14, which is considerably above the 0. 05 significance level. The two-tailed p-value is 0. 318, indicating that the findings are not statically significant. This suggests that the two means are not statically significantly different. Similarly, the one-tailed p-value is 0. 159 and the t-statistic does not exceed the critical value of 2. 1318. We therefore fail to reject the null hypothesis and find no significant difference between the two variables for BOB in this ratio analysis.

2) **SBI**

To find the ratio of non-Int. Income Investment of SBI, the calculation method is the rate of Non-Int. Income of individual year divided by Investment of SBI.

Table 4.55

Ratio Of NII To Investment Of SBI

(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Investment	Ratio(%)
2011-12	34207.48	419066.45	8.16%
2012-13	29835.43	460949.14	6.47%
2013-14	32581.69	519393.19	6.27%
2014-15	37882.13	578793.09	6.54%
2015-16	49315.17	695691.75	7.09%
2016-17	**52828.39**	**705189.08**	**7.49%**
2017-18	68129.96	1027280.87	6.63%
2018-19	75521.03	1183794.24	6.38%
2019-20	76898.74	1119247.77	6.87%
2020-2021	92377.43	1228284.28	7.52%

Average	54957.745	793768.986	6.94%
S.D.	22031.13328	314734.5929	0.006141082
C.V.%	40.09	39.65	8.85

Source: Annual Reports And Accounts Of SBI For The Period Under Study

For the bank under consideration over the ten-year period from 2011–12 to 2020–21, the ratio of Non-Int. Income to Investment shows a generally consistent performance, with the ratio ranging from 6. 27% to 8. 16%. The average ratio of 6. 94% suggests that, on average, fees, commissions, trading income, and other activities account for about 7% of the bank's overall investments. The ratio reached 8. 16% in 2011–12, likely as a result of decreased investment levels at the time compared to subsequent years. The bank was able to keep its level of efficiency in producing non-Int. Income from those investments despite a notable rise in investment amounts throughout the decade.

The ratio's standard deviation (S. D.) is 0. 0061, and its coefficient of variation (C. V.) is 8. 85%, which shows that the ratio is quite stable compared to the more significant changes in non-Int. Income (C. V. = 40. 09%) and investment levels (C. V. = 39. 65%). This suggests that the bank has been able to adapt and keep a balanced approach in using investments for different income sources, even though both non-Int. Income and investments have changed a lot over time. This is because the ratio measures the relationship between them.

Table 4.56

- **T-Test Paired Two Sample For Means**

(RATIO 3 SBI) t-Test: Paired Two Sample for Means		
	Variable 1	**Variable 2**
Mean	0.06906	0.06978
Variance	0.000058373	2.62E-05

Observations	5	5
Pearson Correlation	0.840279601	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-0.37070089	
P(T<=t) one-tail	0.364828499	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.729656998	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

The paired sample t-test for SBI compares two related variables with means of 0. 06906 and 0. 06978. At 4 degrees of freedom, the two-tailed p-value of 0. 73—which is significantly higher than the 0. 05 significance level—is -0. 371 for the determined t-statistic. This suggests that statically speaking there is no difference between the two means. The one-tailed p-value is 0. 365; the t-statistic does not go beyond the critical value of 2. 1318. Therefore, we fail to reject the null hypothesis, concluding that there is no significant difference between the two variables for SBI in this ratio analysis.

3) **BOI**

To find the ratio of non-Int. Income to Investment of BOI, the calculation method is the rate of Non-Int. Income of individual year divided by Investment of BOI. The ratio has been shown in the table below:

Table 4.57

IMPACT OF DEMONETIZATION ON NON FUND BASE INCOME OF PUBLIC SECTOR BANKS IN INDIA

Ratio Of NII To Investment Of BOI

(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Investment	Ratio(%)
2011-12	2641.82	86676.59	3.04%
2012-13	3319.24	88056.87	3.77%
2013-14	3784.6	96387.76	3.93%
2014-15	4319	116489.7	3.70%
2015-16	4287.07	123195.5	3.47%
2016-17	**3671.61**	**122620.9**	**2.99%**
2017-18	6819.43	130751.3	5.21%
2018-19	5845.89	140321.1	4.17%
2019-20	5264.03	150905	3.49%
2020-2021	6808.89	162322.9	4.19%
Average	4676.158	121772.765	3.80%
S.D.	1449.855484	25736.29305	0.006449324
C.V.%	31	21.13	16.98

Source: Annual Reports And Accounts Of BOI For The Period Under Study

The ratio of Non-Int. Income to Investment for the bank under study over the years 2011–12 to 2020–21 reveals a moderate level of volatility, with the ratio ranging from 2. 99% (2016–17) to 5. 21% (2017–18). The average ratio across the ten-year period is 3. 80%, suggesting that, on average, the bank's investment portfolio generated roughly 3. 8% as non-Int. Income. This shows the bank's somewhat dependence on fee-based revenue and other non-fund sources in addition to conventional Int. Income. A sudden increase in non-Int. Income in 2017–18 may be the cause of the peak. This would show that either earnings from services or one-off transactions had a temporary boost.

From a statistical standpoint, the ratio's coefficient of variance (C. V.) is 16. 98%, which indicates somewhat consistent performance by the bank in using investments to produce non-Int. Income. On the other hand, the C. V. for non-Int. Income (31%) and investment (21. 13%) are somewhat higher, suggesting more relative volatility in those elements taken alone. Though the actual income and investment values fluctuated, the ratio stayed fairly constant, which emphasizes the bank's balanced and stable revenue plan in maximizing its resources for non-Int. Income over the ten years.

Table 4.58

- **T-Test Paired Two Sample For Means**

(RATIO 3 BOI) t-Test: Paired Two Sample for Means		
	Variable 1	**Variable 2**
Mean	0.03582	0.0401
Variance	0.000011917	7.02E-05
Observations	5	5
Pearson Correlation	0.650414688	
Hypothesized Mean Difference	0	
df	4	
t Stat	-1.434546434	
P(T<=t) one-tail	0.112365807	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.224731614	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision:

With means of 0. 03582 and 0. 0401, the paired sample t-test for Ratio 3 (BOI) examines two connected variables. The t-statistic is -1. 435 and the degrees of freedom (df) are 4. Both of these values are above the 0. 05 significance level, with a two-tailed p-value of 0. 2247 and a one-tailed p-value of 0. 1124. Moreover, the t-statistic (2. 1318 for one-tail, 2. 7764 for two-tail) does not go beyond the critical

values. Therefore, we fail to reject the null hypothesis and the findings are not statically significant. For BOI in this ratio analysis, this implies that Variable 1 and Variable 2 are not significantly different.

4) BOM

To find the ratio of non-Int. Income to Investment of BOM, the calculation method is the rate of Non-Int. Income of individual year divided by Investment of BOM. The ratio has been shown in the table below:

Table 4.59
Ratio Of NII To Investment Of BOM
(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Investment	Ratio(%)
2011-12	536.1	22503.42	2.38%
2012-13	647.57	22929.62	2.82%
2013-14	922.35	31458.01	2.93%
2014-15	907.36	37289.71	2.43%
2015-16	1020.31	36768.55	2.77%
2016-17	**1037.17**	**36301.73**	**2.85%**
2017-18	1524.81	38677.01	3.94%
2018-19	1539.73	43724.47	3.52%
2019-20	1568.23	59837.27	2.62%
2020-2021	1650.23	57890.59	2.85%
Average	1135.386	38738.038	2.91%
S.D.	406.1937984	12539.91809	0.004788516
C.V%	35.76	32.38	16.44

Source: Annual Reports And Accounts Of BOM For The Period Under Study

The Ratio of Non-Int. Income to Investment for the bank under study from 2011-12 to 2020-21 shows a rather consistent but modest degree of performance in producing non-Int. Income from its investments. The average ratio across the ten-year period is 2. 91%, so on average the bank generated practically 2. 91% of its entire investment as non-interest revenue. From a low of 2. 38% in 2011–12 to a high of 3. 94% in 2017–18, the ratio varied, indicating some changes in income sources or investment patterns. Significantly, the 2017–18 increase might be a sign of particular increases in non-interest revenue generation, including commissions, service fees, or one-time gains.

From a statistical perspective, the coefficient of variation (C.V.) for the ratio is 16. 44%, which shows that the bank has been reasonably consistent in how it has used its investments to generate non-Int. Income. Compared to the greater variation seen in non-Int. Income (C. V. = 35. 76%) and investment values (C. V. = 32. 38%), this is fairly stable. Although income and investment statistics alone differ significantly, the ratio has stayed within a narrow range, indicating that the bank maintained a consistent and balanced approach in using its investments for fee-based and non-traditional income sources throughout the decade.

Table 4.60

- **T-Test Paired Two Sample For Means**

(RATIO 4 BOM) t-Test: Paired Two Sample for Means		
	Variable 1	**Variable 2**
Mean	0.18924	0.30862
Variance	0.000493548	0.022156
Observations	5	5
Pearson Correlation	-0.457303568	
Hypothesized Mean Difference	0	
df	4	
t Stat	-1.665974353	
P(T<=t) one-tail	0.085523859	
t Critical one-tail	2.131846786	

P(T<=t) two-tail	0.171047717	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision:

The paired sample t-test for Ratio 4 (BOM - BOM) compares two variables with means of 0. 18924 and 0. 30862. The calculated t-statistic is -1. 666 with 4 degrees of freedom. Both of the one-tailed p-value of 0. 0855 and the two-tailed p-value of 0. 1710 are above the 0. 05 significance level. Also, the t-statistic (2. 1318 for the one-tail test or 2. 7764 for the two-tail test) does not reach the critical t-values. Thus, we fail to reject the null hypothesis and the outcome is not statically significant. This implies that, for BOM in this ratio analysis, the two variables are not substantially different.

5) **Central Bank Of India**

To find the ratio of non-Int. Income to investment of Central Bank Of India, the calculation method is the rate of Non-Int. Income of individual year divided by Investment of Central Bank Of India. The ratio has been shown in the table below:

Table 4.61
Ratio Of NII To Investment Of Central Bank Of India
(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Investment	Ratio(%)
2011-12	1239.49	54580.21	2.27%
2012-13	1409.37	59387.7	2.37%
2013-14	1676.67	72751.36	2.30%
2014-15	1931.38	86262.4	2.23%
2015-16	1900.39	95655.36	1.98%
2016-17	**1944.47**	**89086.68**	**2.18%**
2017-18	2871.47	92276.56	3.11%
2018-19	2620.41	102769.49	2.54%

2019-20	2416.33	125452.74	1.92%
2020-2021	3622.4	142525.67	2.54%
Average	2163.238	92074.817	2.34%
S.D.	725.1735804	27237.6652	0.00337
C.V.%	33.52	29.58	14.39

Source: Annual Reports And Accounts Of Central Bank Of India For The Period Under Study

With an average ratio of 2. 34%, the bank under study from 2011–12 to 2020–21 shows a modest and somewhat consistent trend in the ratio of Non-Int. Income to Investment. This shows that, on average, the bank generated roughly 2. 34% of its overall investment from non-interest revenue sources like fees, commissions, and other service-based earnings. With 3. 11% in 2017–18, the ratio peaked. This can indicate either a brief increase in non-Int. Income or better income efficiency. Conversely, the lowest ratio of 1. 92% in 2019–20 may be caused by under performance in fee-based income or excessive investment growth without a corresponding increase in non-Int. Income.

The statistical study backs up this somewhat constant trend. With a coefficient of variation (C. V.) of 14. 39%, the ratio points to little variance in the bank's capacity to produce non-interest revenue from its investments. Comparatively, the C. V. for non-Int. Income (33. 52%) and investment (29. 58%) are much higher, which emphasizes more volatility in those particular elements. Notwithstanding these variations, the ratio stayed within a tight range, which pointed to a consistent and stable operational approach in producing non-Int. Income relative to investment levels over the ten-year period. A good sign of the bank's sound financial plan and ability to keep a reliable flow of varied revenue is this stability.

Table 4.62

- **T-Test Paired Two Sample For Means**

(Central Bank) Ratio 3 T-Test: Paired Two Sample For Means

	Variable 1	Variable 2
Mean	0.0223	0.02458
Variance	0.000002215	2.01E-05
Observations	5	5
Pearson Correlation	0.244842853	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-1.16725249	
P(T<=t) one-tail	0.15397258	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.307945159	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision:

With means of 0. 0223 and 0. 02458, the paired sample t-test for Ratio 3 (Central Bank) examines two connected variables. The t-statistic is -1. 167 with 4 degrees of freedom, and the p-values are

0. 154 (one-tailed) and 0. 308 (two-tailed), All of which are greater than the 0. 05 significance level. For either test, the t-statistic also falls below the critical values.

Therefore, the outcome is not statically significant, and we fail to reject the null hypothesis. This shows that in the Central Bank's ratio analysis the two factors have no noticeable difference.

6) Canara Bank

To find the ratio of non-Int. Income to Investment of Canara Bank, the calculation method is the rate of Non-Int. Income of individual year divided by Investment of Canara Bank. The ratio has been shown in the table below:

Table 4.63

Ratio Of NII To Investment Of Canara Bank

(From 2011-12 To 2020-21) (Rs in crores)

IMPACT OF DEMONETIZATION ON NON FUND BASE INCOME OF PUBLIC SECTOR BANKS IN INDIA

Years	Non Int Income	Investment	Ratio(%)
2011-12	2668.49	86499.41	3.08%
2012-13	3104.51	106496.6	2.91%
2013-14	3307.65	127533.5	2.59%
2014-15	4143.68	135445.4	3.06%
2015-16	4733.45	155406.5	3.04%
2016-17	**5131.26**	**152469.8**	**3.36%**
2017-18	7852.26	162072.9	4.84%
2018-19	7398	157443.6	4.69%
2019-20	7372.41	168678.1	4.37%
2020-2021	11799.4	192645.4	6.12%
Average	5751.111	144469.10	3.81
S.D.	2844.4627	31161.81	0.011389
C.V.%	49.45	21.56	29.92

Source: Annual Reports And Accounts Of Canara Bank For The Period Under Study

The ratio of non-Int. Income to investment for the bank under analysis over the years 2011–12 to 2020–21 shows a mostly upward trend, which points to better performance in producing non-interest revenue from investments. The average ratio is 3. 81%; the lowest value in 2013–14 is 2. 59%; the highest value in 2020–21 is 6. 12%. This notable growth over the last few years points to the bank's likely effective diversification of its income sources, possibly through the development of commissions, fee-based services, and other non-fund-based activities. The sharp increase post-2016–17 points to a deliberate change or operational advancement in using investments for income outside of conventional Int. Income.

From a statistical standpoint, the C. V. for the ratio—which is 29. 92%—shows moderate variation in the bank's capacity to produce non-interest revenue from its investments. Intriguingly, even if the investment amount itself has a comparatively lower variation (C. V. = 21. 56%), the non-Int. Income is far more variable (C. V. = 49. 45%), therefore variations in the ratio are more affected by changes in non-Int.

Income than by investment levels. Despite some year-to-year variations, the data generally indicates an encouraging performance trend whereby the bank has consistently enhanced its capacity to profit from non-traditional channels.

Table 4.64

- **T-Test Paired Two Sample For Means**

(Canara Bank) Ratio 3 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.02936	0.04676
Variance	0.000004183	9.84E-05
Observations	5	5
Pearson Correlation	-0.106418432	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-3.762305072	
P(T<=t) one-tail	0.009867724	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.019735447	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision:

For Ratio 3 (Canara Bank), the paired sample t-test looks at two connected variables with means of 0. 02936 and 0. 04676. The t-statistic is -3. 76 with 4 degrees of freedom, and the p-values are 0. 0099 (one-tailed) and 0. 0197 (two-tailed)—both of which are smaller than the significance level of 0. 05. Furthermore, the t-statistic surpasses both critical values, hence there is statistical significance.

Thus, the result is statically significant, and we reject the null hypothesis. This suggests that Canara Bank's ratio analysis shows a large difference between the two variables.

7) Indian Bank

To find the ratio of non-Int. Income to Investment of Indian Bank, the calculation method is the rate of Non-Int. Income of individual year divided by Investment of Indian Bank. The ratio has been shown in the table below:

Table 4.65
Ratio Of NII To Investment Of Indian Bank
(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Investment	Ratio(%)
2011-12	1188.06	34861.12	3.40%
2012-13	1194.71	37995.79	3.14%
2013-14	1293.4	41899.19	3.08%
2014-15	1378.03	47035.28	2.93%
2015-16	1372.21	46060.45	2.98%
2016-17	**1788.94**	**53282.93**	**3.35%**
2017-18	2222.4	67781.19	3.27%
2018-19	2416.59	71619.14	3.37%
2019-20	1891.43	65271.55	2.89%
2020-2021	3325.5	81871.16	4.06%
Average	1807.127	54767.78	3.25
S.D.	687.3687461	15913.75668	0.003414365
C.V.%	38.03	29.05	10.51

Source: Annual Reports And Accounts Of Indian Bank For The Period Under Study

Canara Bank's Ratio of Non-Int. Income to Investment over the years 2011–12 to 2020–21 reveals a fairly consistent performance with a average ratio of 3. 25%. The ratio varied from a low of 2. 89% (2019-20) to a high of 4. 06% (2020-21), showing a modest capacity to generate revenue from non-fund sources including trading revenue, fees, and commissions. Although

there were modest variations throughout the years, the ratio usually stayed within a tight range, implying that the bank routinely made about 3% of its investments via non-interest revenue. The significant rise in 2020–21 points to a possible move toward better revenue source diversification in recent years.

statically, the bank's performance in this field is highly consistent and exhibits low variation as the coefficient of variation (C. V.) for the ratio is 10. 51%. On the other hand, the C. V. for non-Int. Income (38. 03%) and investment (29. 05%) are much higher, which shows that the actual values of income and investment fluctuate more. The ratio stayed consistent throughout these changes, which indicates the bank kept a balanced approach in using its investments for non-Int. Income. generally, the data implies Canara Bank has shown effective and consistent use of its assets over the ten years to boost its non-Int. Income stream.

Table 4.66

- **T-Test Paired Two Sample For Means**

(Indian Bank) Ratio 3 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.03106	0.03388
Variance	3.378E-06	1.79E-05
Observations	5	5
Pearson Correlation	-0.03776333	
Hypothesized Mean Difference	0	

df	4	
t Stat	-1.34908156	
P(T<=t) one-tail	0.12431029	
t Critical one-tail	2.13184679	
P(T<=t) two-tail	0.24862058	
t Critical two-tail	2.77644511	

Data Is Calculated By Researcher

Decision:

The paired sample t-test for Ratio 3 (Indian Bank) shows that two related variables have means of 0. 03106 and 0. 03388. The t-statistic is -1. 35 with 4 degrees of freedom. The p-values are 0. 1243 (one-tailed) and 0. 2486 (two-tailed), which are both bigger than the 0. 05 significance level. Furthermore, the t-statistic fall s below the critical values for both tests Consequently, we fail to reject the null hypothesis as the outcome is not statically significant. For Indian Bank, this implies that the two factors in the ratio analysis have little bearing on one another.

8) Indian Overseas Bank

To find the ratio of non-Int. Income to Investment of Indian Overseas Bank, the calculation method is the rate of Non-Int. Income of individual year divided by Investment of Indian Overseas Bank. The ratio has been shown in the table below:

Table 4.67

Ratio Of NII To Investment Of Indian Overseas Bank

(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Investment	Ratio(%)
2011-12	1225.1	48610.45	2.52%
2012-13	1681.04	55565.88	3.02%
2013-14	1972.91	61417.35	3.21%
2014-15	2209.52	70236.8	3.15%
2015-16	2138.6	81310.35	2.63%

2016-17	**2528.26**	**79189.55**	**3.19%**
2017-18	3372.64	71549.19	4.71%
2018-19	3746.44	68645.94	5.45%
2019-20	4206.32	66932.27	6.28%
2020-2021	3306.37	76416.08	3.46%
Average	2638.72	67987.386	3.76%
S.D.	970.3446098	10361.52519	0.0127194
C.V.%	36.77	15.24	33.81

Source: Annual Reports And Accounts Of Indian Ove. Bank For The Period Under Study

Over the years 2011–12 to 2020–21, the data shows the trend of Non-Int. Income (NII) as a proportion of investments in a financial institution. From 2. 52% in 2011-12 to a peak of 6. 28% in 2019-20, before it dropped to 3. 46% in 2020-21, the NII-Investment Ratio has mostly risen
over time. Compared to its investment base, this upward trend shows that the bank has been more successful in making money from things other than its main business (like fees, commissions, and trading profits). The most growth seems to occur between 2016–17 and 2019–20, which indicates a solid performance in using assets to produce side income during that time.

From a statistical perspective, the average Non-Int. Income during this decade was ₹2638. 72 crore, with an average investment base of ₹67987. 39 crore, and a mean NII-Investment ratio of 3. 76%. The coefficient of variation (C. V.) for the ratio is 33. 81%, which shows that the ratio varied a lot from year to year. The C. V. for Non-Int. Income (36. 77%) is comparatively higher than that for Investments (15. 24%), indicating that income was more variable than the investment base. This variability could come from market conditions, changes in regulations, or internal policies of the bank that affect non-core revenue streams. overall, while the bank showed a positive trend in improving NII performance relative to investments, the inconsistency points to room for more stable and strategic income generation.

Table 4.68

- **T-Test Paired Two Sample For Means**

(Indian Ov.Bank) Ratio 3 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.02906	0.04618
Variance	9.753E-06	0.00017108
Observations	5	5
Pearson Correlation	0.94238446	
Hypothesized Mean Difference	0	
df	4	
t Stat	-3.756663	
P(T<=t) one-tail	0.00991607	
t Critical one-tail	2.13184679	
P(T<=t) two-tail	0.01983215	
t Critical two-tail	2.77644511	

Data Is Calculated By Researcher

Decision :

With 5 observations each, the paired t-test analyzes two sets of connected data, Ratio 3 for Indian Overseas Bank. The mean of Variable 1 (0. 02906) is less than the mean of Variable 2 (0. 04618). The t-statistic is -3. 76 and the p-value for the two-tailed test is 0. 0198, which is less than the significance level of 0. 05. The outcome is statically significant as the absolute t-statistic (|−3. 76| > 2. 776) exceeds the critical value.

Conclusion: The two means are quite different, which implies that Ratio 3 has changed significantly between the two times or circumstances being compared. The high positive correlation (0. 94) suggests a consistent trend across both sets.

9) PNB

To find the ratio of non-Int. Income to Investment of PNB, the calculation method is the rate of Non-Int. Income of individual year divided by Investment of PNB. The ratio has been shown in the table below:

Table 4.69

Ratio Of NII To Investment Of PNB

(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Investment	Ratio(%)
2011-12	3655.36	96911.28	3.77%
2012-13	4239.51	125819.9	3.37%
2013-14	4302.03	134734	3.19%
2014-15	4710.34	149224.7	3.15%
2015-16	6174.6	156761.7	3.93%
2016-17	**6976**	**165126.5**	**4.22%**
2017-18	9167.58	191527.2	4.78%
2018-19	8888.35	205910.2	4.31%
2019-20	7367.39	209723	3.51%
2020-2021	9387.66	253782.5	3.69%
Average	6486.882	168952.082	3.79%
S.D.	2197.919006	46556.47781	0.00525965
C.V.%	33.88	27.58	13.87

Source: Annual Reports And Accounts Of PNB For The Period Under Study

Over the ten-year period from 2011–12 to 2020–21, the data shows the link between Investments and Non-Int. Income (NII). The NII-Investment Ratio ranged from 3. 15% to 4. 78%, with an average of 3. 79%. From ₹3655. 36 crore in 2011–12 to ₹9387. 66 crore in 2020–21, Non-Int. Income generally increased over time even if there were some ups and downs. This shows that income from sources other than interest, like commissions, fees, and trading gains, has grown. With 4. 78%, the

highest NII-Investment efficiency was recorded in 2017–18, most likely as a result of better usage of investment portfolios during that time.

The NII-Investment Ratio has a statically low coefficient of variation (C. V.) of 13. 87%, indicating rather little variation and hence fairly constant ratio over time. Conversely, the Non-Int. Income (C. V. = 33. 88%) and Investments (C. V. = 27. 58%) displayed greater volatility, implying that despite the fact that both income and investments increased noticeably, their ratio stayed constant. This stability in the ratio shows that the bank kept a balanced approach when it made non-core income from its investments, which is a sign of good strategic financial management.

Table 4.70

- **T-Test Paired Two Sample For Means**

(Punjab Bank) Ratio 3 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.03482	0.04102
Variance	0.000012292	2.5927E-05
Observations	5	5
Pearson Correlation	-0.127044433	
Hypothesized Mean Difference	0	
df	4	
t Stat	-2.120231274	
P(T<=t) one-tail	0.050657838	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.101315677	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

The paired t-test for Punjab Bank's Ratio 3 compares two related data sets with 5 observations each. Variable 1 (0. 03482)'s mean is smaller than Variable 2 (0. 04102).

With a t-statistic of -2. 12 and a two-tailed p-value of 0. 1013, which is higher than the 0. 05 significance level, the findings are noteworthy. Furthermore, the absolute t-statistic (2. 12) fall s shy of the critical threshold (2. 776).

Conclusion: The two means do not differ significantly, therefore the outcome is not statically significant, which means there is not much evidence of a significant difference between them. The low and negative correlation (-0. 127) points to a weak and inverse link between the two factors.

10) Union Bank Of India

To find the ratio of non-Int. Income to Investment of Union Bank Of India, the calculation method is the rate of Non-Int. Income of individual year divided by Investment of Union Bank Of India . The ratio has been shown in the table below:

Table 4.71

Ratio Of NII To Investment Of Union Bank Of India

(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Investment	Ratio(%)
2011-12	2039.72	58913.15	3.46%
2012-13	2316.31	63103.81	3.67%
2013-14	2868.04	81803.31	3.50%
2014-15	3140.73	94636.35	3.31%
2015-16	3957.12	95449.41	4.14%
2016-17	**3934.43**	**90573.21**	**4.34%**
2017-18	5429.98	113441.3	4.78%
2018-19	5462.08	125510.7	4.35%
2019-20	5041.71	128391.2	3.92%
2020-2021	5789.27	154251.5	3.75%
Average	3997.939	100607.391	3.92%
S.D.	1381.321883	29992.55114	0.004714941

C.V.%	34.55	29.81	12

Source: Annual Reports And Accounts Of UBOI For The Period Under Study

The information provides a decade-long review of how Non-Int. Income (NII) relates to Investments, specifically highlighting the NII-Investment Ratio (%). Throughout these years, the NII saw a consistent rise from ₹2039. 72 crore in 2011-12 to ₹5789. 27 crore in 2020-21. Likewise, Investments grew from ₹58,913. 15 crore to ₹1,54,251. 5 crore during the same time frame. Even with this progress, the NII-Investment ratio stayed quite consistent, fluctuating between 3. 31% and 4. 78%, with an overall average of 3. 92%. The peak effectiveness in utilizing investments to generate non-Int. Income was observed in 2017-18 (4. 78%), whereas the lowest efficiency occurred in 2014-15 (3. 31%).

From a statistical perspective, the coefficient of variation (C. V.) for the NII-Investment Ratio stands at 12%, which shows relatively low variation and indicates a steady income pattern in relation to investments. In contrast, the C. V. for NII (34. 55%) and Investments (29. 81%) exhibit greater variability, signifying that, although both elements experienced more fluctuations over the years, the effectiveness of generating income from investments remained relatively constant. This steadiness in the ratio reflects effective investment management and reliable income generation practices, even in the face of shifts in investment amounts and economic circumstances.

Table 4.72

- **T-Test Paired Two Sample For Means**

(Union Bank) Ratio 3 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.03616	0.04228
Variance	0.000010223	1.6387E-05
Observations	5	5
Pearson Correlation	-0.305258751	

Hypothesized Mean Difference	0	
Df	4	
t Stat	-2.329439098	
P(T<=t) one-tail	0.04015071	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.080301419	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

The paired t-test for Union Bank's Ratio 3 examines two connected sets of data, each containing 5 observations. The average of Variable 1 is 0. 03616, whereas Variable 2 has a greater average of 0. 04228. The computed t-statistic stands at -2. 33, with a one-tailed p-value of 0. 0401, which is lower than 0. 05, signifying statistical significance at the one-tailed 5% level.

Conversely, in the case of a two-tailed test, the p-value is 0. 0803, which is above the 0. 05 limit, and the absolute t-statistic (2. 33) is less than the critical value for a two-tailed test (2. 776). Consequently, we do not reject the null hypothesis in this two-tailed scenario. Conclusion: There is a notable difference in the one-tailed test, indicating that Variable 2 appears to have higher values; however, the outcome does not reach statistical significance in a more rigorous two-tailed test. The negative Pearson correlation (-0. 305) implies a weak inverse connection between the paired data points.

11) UCO Bank

To find the ratio of non-Int. Income to Investment of UCO Bank , the calculation method is the rate of Non-Int. Income of individual year divided by Investment of UCO Bank. The ratio has been shown in the table below.

Table 4.73

Ratio Of NII To Investment Of UCO Bank

(From 2011-12 To 2020-21) (Rs in crores)

IMPACT OF DEMONETIZATION ON NON FUND BASE INCOME OF PUBLIC SECTOR BANKS IN INDIA

Years	Non Int Income	Investment	Ratio(%)
2011-12	925.41	42927.28	2.15%
2012-13	965.55	45771.5	2.10%
2013-14	952.17	52244.9	1.82%
2014-15	1320.51	67451.69	1.95%
2015-16	2003.55	68859.43	2.90%
2016-17	**1596.31**	**83974.2**	**1.90%**
2017-18	2114.49	74019.12	2.85%
2018-19	1121	70962.15	1.58%
2019-20	1513.51	82231.69	1.86%
2020-2021	2871.21	90998.81	3.15%
Average	1538.371	67944.077	2.23%
S.D.	632.2691117	16342.3245	0.005393041
C.V.%	41.09	24.05	24.22

Source: Annual Reports And Accounts Of UCO For The Period Under Study

The information presents the patterns in Non-Int. Income (NII), Investments, and the corresponding Ratio (%) across a decade from 2011-12 to 2020-21. The NII-Investment Ratio experienced significant changes, hitting a minimum of 1. 58% in 2018-19 and peaking at 3. 15% in 2020-21, averaging 2. 23%. This inconsistency implies that the bank's ability to earn income from non-primary activities compared to its investment portfolio has been variable. The most notable increase in the ratio took place in 2020-21, suggesting enhanced performance that year, potentially due to strategic adjustments or favorable external factors.

In terms of statistics, the Coefficient of Variation (C. V.) for the NII-Investment Ratio is 24. 22%, reflecting moderate fluctuations. Conversely, Non-Int. Income has a significant C. V. of 41. 09%, indicating considerable variations over the years, while Investments display a steadier pattern with a C. V. of 24. 05%. This suggests that the investment portfolio grew at a steady pace, but the NII was much more erratic, likely

due to shifts in policies, market dynamics, or dependence on unpredictable sources of income like trading profits or one-off charges. The instability in the ratio implies that the bank should consider implementing more reliable and sustainable strategies for non-Int. Income to achieve stable financial outcomes.

Table 4.74

- **T-Test Paired Two Sample For Means**

(Uco Bank) Ratio 3 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.02184	0.02268
Variance	0.000017703	4.7297E-05
Observations	5	5
Pearson Correlation	0.813032414	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-0.443359744	
P(T<=t) one-tail	0.340214967	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.680429934	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

The paired t-test for UCO Bank's Ratio 3 examines two related groups, each having 5 data points. The average of Variable 1 stands at 0. 02184, which is marginally less than the average of Variable 2, recorded at 0. 02268. The computed t-statistic is -0. 44, and the two-tailed p-value equals 0. 6804, significantly higher than the 0. 05 significance threshold. Likewise, the t-statistic does not surpass the critical limits for either one-tailed or two-tailed analyses.

Conclusion: There is no significant statistical disparity between the two averages. The strong positive Pearson correlation of 0. 81 reflects a robust connection between the

paired data sets; however, the minimal variation in averages is insufficient to imply any actual change or impact between the two groups.

12) P&S Bank

To find the ratio of non-Int. Income to Investment of P&S Bank , the calculation method is the rate of Non-Int. Income of individual year divided by Investment of Punjab & Sind Bank. The ratio has been shown in the table below:

Table 4.75
Ratio Of NII To Investment Of P&S Bank
(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Investment	Ratio(%)
2011-12	437.08	18643.65	2.34%
2012-13	417.46	20064.13	2.08%
2013-14	417.15	22542.48	1.85%
2014-15	427.28	28294.11	1.51%
2015-16	428.75	26751.7	1.60%
2016-17	**478.48**	**27645.04**	**1.73%**
2017-18	578.1	27948.5	2.06%
2018-19	581.2	32981.76	1.76%
2019-20	828.28	26172.93	3.16%
2020-2021	897.39	24552.1	3.65%
Average	549.117	25559.6	2.17
S.D.	177.237629	4250.069379	0.00702696
C.V%	32.27	16.62	32.32

Source: Annual Reports And Accounts Of P&S Bank For The Period Under Study

The information provides a decade-long analysis of Non-Int. Income (NII), Investments, and the resulting NII-Investment Ratio from 2011-12 through 2020-21. At first, the ratio displayed a downward trend, dropping from 2. 34% in 2011-12 to a minimum of 1. 51% in 2014-15, indicating a decline in efficiency in generating non-Int. Income in relation to investments. Nevertheless, following 2015-16, the ratio started to rise slowly, hitting 3. 65% in 2020-21, which points to a better recovery in the bank's capability to generate income from non-traditional sources. This improvement could be linked to adjustments in income strategies, efforts to diversify, or enhancements in fee-based services.

From a statistical perspective, the average NII-Investment Ratio throughout the decade is recorded at 2. 17%, accompanied by a coefficient of variation (C. V.) of 32. 32%, reflecting moderate variability in income efficiency. Conversely, Non-Int. Income demonstrates a comparable C. V. of 32. 27%, indicating significant yearly volatility. In contrast, Investments exhibited relative stability with a C. V. of 16. 62%. This suggests that while the investment portfolio expanded consistently, the bank's earnings from non-interest sources varied more significantly, likely due to changing market dynamics or inconsistent policy implementation. The overall trend indicates potential for enhancing the stability of non-Int. Income to ensure steady financial results.

Table 4.76

- **T-Test Paired Two Sample For Means**

(P& S Bank) Ratio 3 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.01876	0.02472
Variance	0.000011693	7.721E-05
Observations	5	5
Pearson Correlation	-0.821032278	
Hypothesized Mean Difference	0	
Df	4	

t Stat	-1.133489603	
P(T<=t) one-tail	0.160169443	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.320338885	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

The paired t-test for Punjab and Sind Bank's Ratio 3 examines two connected variables through 5 data points. Mean for Variable 1 is 0. 01876, while Variable 2 boasts a greater mean of 0. 02472. The t-statistic calculated is -1. 13, and the p-value obtained from the two-tailed test is 0. 3203, which surpasses the 0. 05 significance threshold. Furthermore, the t-statistic remains below the critical value (|−1. 13|).

Table 4.77

Ratio of Non-Int. Income to Investment of All PSBs under Study
(From 2011-12 to 2020-21)

(Ratio in Percentage)

Years	BOB	SBI	BOI	BOM	CBI	Canara Bank	IOB	PNB	Indian Bank	Union Bank Of India	Uco Bank	P& S Bank
2011-12	4.43%	8.16%	3.04%	2.38%	2.27%	3.08%	2.52%	3.77%	3.40%	3.46%	2.15%	2.34%
2012-13	4.73%	6.47%	3.77%	2.82%	2.37%	2.91%	3.02%	3.37%	3.14%	3.67%	2.10%	2.08%
2013-14	3.59%	6.27%	3.93%	2.93%	2.30%	2.59%	3.21%	3.19%	3.08%	3.50%	1.82%	1.85%
2014-15	4.55%	6.54%	3.70%	2.43%	2.23%	3.06%	3.15%	3.15%	2.93%	3.31%	1.95%	1.51%
2015-16	4.18%	7.09%	3.47%	2.77%	1.98%	3.04%	2.63%	3.93%	2.98%	4.14%	2.90%	1.60%

2016-17	**4.65%**	**7.49%**	**2.99%**	**2.85%**	**2.18%**	**3.36%**	**3.19%**	**4.22%**	**3.35%**	**4.34%**	**1.90%**	**1.73%**
2017-18	5.64%	6.63%	5.21%	3.94%	3.11%	4.84%	4.71%	4.78%	3.27%	4.78%	2.85%	2.06%
2018-19	4.56%	6.38%	4.17%	3.52%	2.54%	4.69%	5.45%	4.31%	3.37%	4.35%	1.58%	1.76%
2019-20	4.03%	6.87%	3.49%	2.62%	1.92%	4.37%	6.28%	3.51%	2.89%	3.92%	1.86%	3.16%
2020-2021	4.20%	7.52%	4.19%	2.85%	2.54%	6.12%	3.46%	3.69%	4.06%	3.75%	3.15%	3.65%

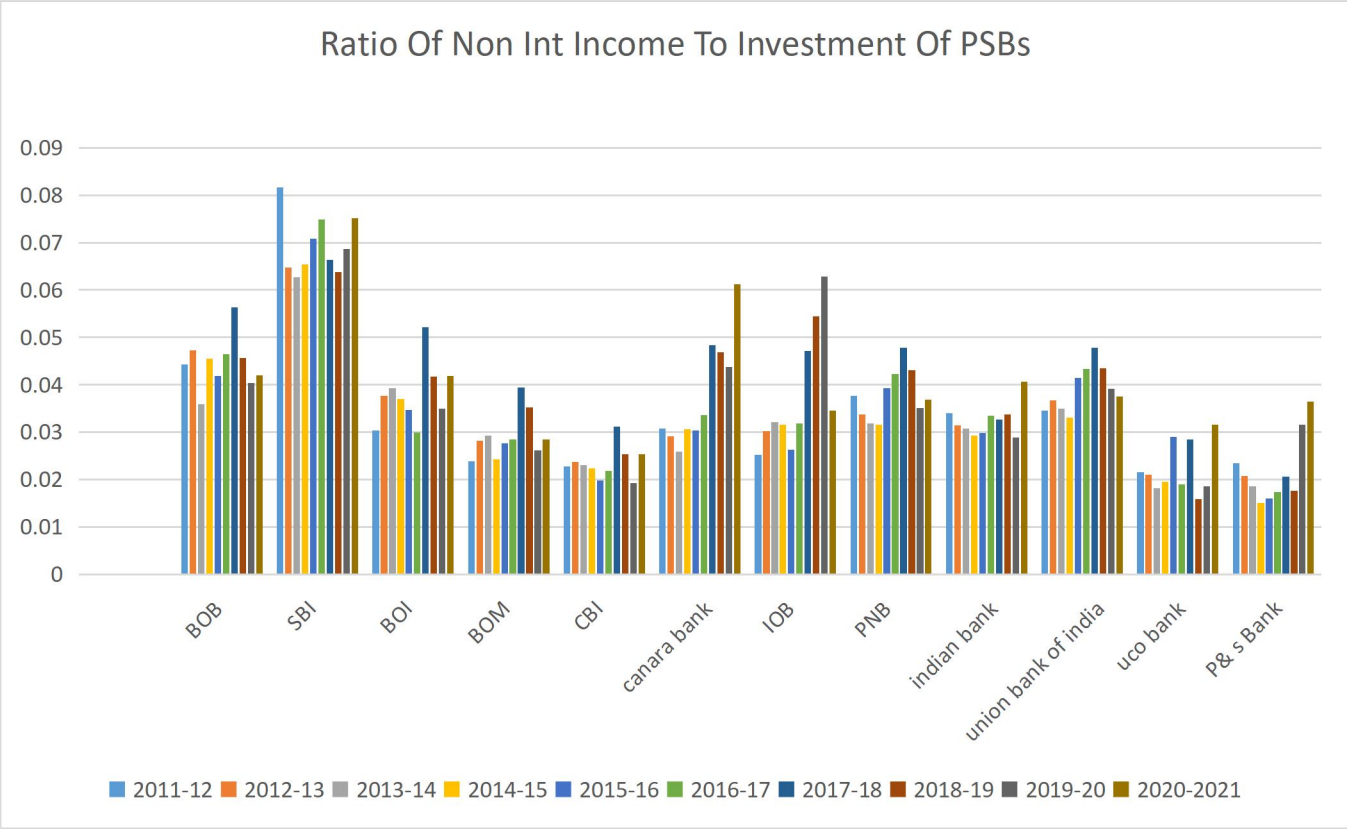
Source: Annual Reports And Accounts Of All PSBs For The Period Under Study

Chart 4.3

Ratio of Non-Int. Income to Investment of All PSBs under Study

(From 2011-12 to 2020-21)

(Ratio in Percentage)



The graph demonstrates the comparison of non-interest earnings to total assets for several PSBs in India from 2011-12 to 2020-21. It shows significant differences among banks and over time, indicating various abilities and approaches to generating income outside of primary lending activities. The SBI is particularly notable for having consistently high ratios, especially in the years 2011-12, 2012-13, and 2016-17, signifying a strong dependency on varied income sources like fees, commissions, and treasury functions. Likewise, BOB (BOB) and BOI (BOI) exhibit relatively solid and stable ratios, implying successful initiatives in generating non-Int. Income. On the other hand, banks like Central Bank Of India, Indian Overseas Bank (IOB), and Punjab and Sind Bank show lower and more stagnant ratios across the decade, suggesting ongoing reliance on Int. Income and limited advancements in developing fee-generating services. Canara Bank, Union Bank Of India, and PNB show moderate results with some annual variations, experiencing significant increases during certain years such as 2014-15 and 2018-19, likely due to particular policy decisions or extraordinary results. In summary, the graph emphasizes that while some PSBs have enhanced their income diversification efforts, many others continue to fall short, highlighting the need for a broader strategic emphasis on boosting non-interest revenue sources to strengthen financial stability and resilience.

- **Two Way Anova Test Is Applied For PSBs Under Study (F Test)**

Two-way F-test has been applied to study impact of demonetization on PSBs with the following hypothesis :

1) **Null Hypothesis (Ho):** Under this study, there is no significant difference in the non-Int. Income to Investment ratio between the banks.

2) **Null Hypothesis (Ho):** Under this study, there is no significant year-wise difference in the non-Int. Income to Investment ratio within the banks.

Table 4.78

ANOVA TABLE

Source	Sum	Degree Of Freedom	Variance	F

		(d.f.)	(Sum/d.f.)	Ratio
Between Banks(SSC)	0.0182	(c-1) = (12-1) =11	0.00165	45.83
Within Banks (SSR)	0.0016	(r-1) = (10-1) = 9	0.00018	5
Error (SSE)	0.0036	(c-1) (r-1) = 99	0.000036	

Data is calculated by the researcher

1) **F Test Between the Banks**

V1 = 11, V2 = 99

Table value of F at 5 % level of significance = 1.89

$F = \frac{\text{Higher Variance}}{\text{Smaller Variance}}$ $F = \frac{0.00165}{0.000036} = 45.83$

Since the F-value determined (45. 83) exceeds the critical value (1. 89) at the 5% significance level, we dismiss the null hypothesis. This indicates that there is a notable difference in the variances of the proportion of non-Int. Income to total assets within the public sector banks. Therefore, the differences in performance among the banks are statistically meaningful.

2) **F Test Within the Banks**

V1 = 9, V2 = 99

Table value of F at 5 % level of significance = 1.98

$F = \frac{\text{Higher Variance}}{\text{Smaller Variance}}$ $F = \frac{0.00018}{0.000036} = 5$

In the F-test performed among the banks, the observed F-value is 5, which is markedly greater than the table value of 1. 98 at the 5% significance level with degrees of freedom V1 = 9 and V2 = 99. Because the observed F surpasses the critical threshold, the null hypothesis is dismissed. This suggests that there is a notable disparity in the variances among the banks over time. In simpler terms, the individual PSBs have shown instability in the ratio of non-Int. Income to total assets throughout the analyzed period. The variations indicate that these banks have encountered

different levels of effectiveness in generating non-Int. Income from their assets in various years.

4.6.4 Ratio Of NII To Owner's Fund Of The Banks Under Study

The ratio of non-Int. Income to owner's fund offers a major indicator of how effectively banks produce revenue from non-lending activities relative to their owned capital. This proportion emphasizes how well the bank may diversify its sources of income beyond conventional interest profits, hence enhancing financial sustainability. The performance of chosen PSBs in utilizing owner's equity to produce fee-based and other non-interest revenues across years is assessed in this study by an examination of their ratio.

Ratio Of NII To Total Income $= \frac{\text{Non Interest Income}}{\text{Owner's Fund}} * 100$

In the table below the ratio of the study for All the banks has been shown :

PUBLIC SECTOR BANKS

1) **BOB**

Ratio of NII to Owner's Fund of BOB is calculated by the rate of NII of individual year divided by Owner's Fund.

Table 4.79

Ratio Of NII To Owner's Fund Of BOB

(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Owner's Fund	Ratio (%)
2011-12	3287.1	21433.76	15.33%
2012-13	4100.42	28103.92	14.59%
2013-14	4510.62	32859.25	13.73%
2014-15	5555.15	37416.15	14.84%
2015-16	5449.27	41574.09	13.10%
2016-17	**5992.17**	**42041.07**	**14.25%**
2017-18	7936.78	42605.48	18.62%

2018-19	7992.21	46035.87	17.36%
2019-20	7887.05	49423.76	15.95%
2020-2021	12191.33	75178.92	16.21%
Average	6490.21	41667.227	15.40%
S.D.	2601.243797	14500.26729	0.01684720
C.V.%	40.08	34.80	10.94

Source: Annual Reports And Accounts Of BOB For The Period Under Study

The banks examined exhibit a fluctuating pattern in the ten-year period from 2011–12 to 2020–21 in terms of their **Ratio of Non-Int. Income to Owner's Fund. Peaked in 2017–18 at 18.62%, suggesting a higher contribution of non-Int. Income relative to the banks' possessed capital that year, possibly caused by strategic changes in revenue generation or policy effects. In 2015–16, the lowest ratio 13.10% indicates a rather poorer performance in non-Int. Income generation compared to the owner's fund. With a coefficient of variation (C.V.) of 10.94%, the average ratio over the period is 15.40%, indicating average stability. Although non-interest revenue is still a reliable source of income for the banks, the data shows year-to--year fluctuations driven by financial circumstances, changes, and operational tactics.

Table 4.80

- **T-Test Paired Two Sample For Means**

(RATIO 4- BOB) t-Test: Paired Two Sample for Means		
	Variable 1	**Variable 2**
Mean	0.14318	0.16478
Variance	7.9997E-05	0.000267017
Observations	5	5
Pearson Correlation	-0.36604227	
Hypothesized Mean Difference	0	
Df	4	

t Stat	-2.266762629	
P(T<=t) one-tail	0.043017407	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.086034813	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

For BOB, a paired sample t-test was used to examine the Ratio of Non-Int. Income to Owner's Fund under two distinct time frames or scenarios. The mean of Variable 1 was 0.14318, whereas that of Variable 2 was 0.16478, pointing to a little growth in the second group. With a calculated t-statistic of -2.27 and 4 degrees of freedom (df), the two-tailed test p-value is 0.0860—which is more than the 0.05 significance level—indicating that the difference in means is not statistically significant at the 5% level. However, for a one-tailed test, the p-value is 0.043, which is less than 0.05, which means that the increase in the ratio from Variable 1 to Variable 2 is statically significant at the 5% level in a directional (one-tailed) context. Thus, we may tentatively deduce that while there is some evidence of a ratio rise, it is insufficient for a two-tailed inference.

2) **SBI**

To find the ratio of non-Int. Income to Owner's Fund of SBI, the calculation method is the rate of Non-Int. Income of individual year divided by Owner's Fund of SBI.

Table 4.81

Ratio Of NII To Owner's Fund Of SBI

(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Owner's Fund	Ratio (%)
2011-12	34207.48	82836.25	41.29%
2012-13	29835.43	105558.97	28.26%
2013-14	32581.69	124348.99	26.20%
2014-15	37882.13	146623.96	25.83%

2015-16	49315.17	160640.97	30.69%
2016-17	**52828.39**	**178442.05**	**29.60%**
2017-18	68129.96	180800.92	37.68%
2018-19	75521.03	204581.5	36.91%
2019-20	76898.74	208949.26	36.80%
2020-2021	92377.43	226405	40.80%
Average	54957.745	161918.787	33.41
S.D.	22031.1332	47019.53274	0.059307002
C.V.%	40.05	29.09	17.75

Source: Annual Reports And Accounts Of SBI For The Period Under Study

The data shows that the Ratio of Non-Int. Income to Owner's Fund has changed a lot between 2011-12 and 2020-21, over the 10-year period. The ratio peaked at 41.29% in 2011-12, showing a very high level of non-Int. Income generation in comparison to the owned capital. The ratio, though, fell over the next years to reach a low of 25.83% in 2014–15 before progressively increasing once more. This rise and fall pattern implies that, despite non-Int. Income remaining a crucial part of total revenue, external elements like rules, the state of the economy, and bank internal policies might have affected its variations.

The average ratio of 33.41% over the whole period suggests a rather significant contribution of non-interest revenue to the bank's equity base. A coefficient of variation (C.V.) of 17.75% and a standard deviation of 5.93% suggest moderate ratio volatility, which mirrors a fairly stable but somewhat erratic trend. This modest fluctuation suggests the bank has usually been successful in keeping a constant stream of non-interest revenue, however some years fared better because of particular operational or market-driven factors. The ratio generally shows the bank's ongoing dependence on several revenue streams outside of the usual interest-based operations.

Table 4.82

- **T-Test Paired Two Sample For Means**

(RATIO 4- SBI) T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.30454	0.36358
Variance	0.004044153	0.001691
Observations	5	5
Pearson Correlation	-0.759709661	
Hypothesized Mean Difference	0	
df	4	
t Stat	-1.33980666	
P(T<=t) one-tail	0.125679637	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.251359275	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

For SBI, a paired sample t-test was used to examine the Ratio of Non-Int. Income to Owner's Fund across two time frames. The mean rose from 0.30454 (Variable 1) to 0.36358 (Variable 2), showing a positive trend. The t-statistic of -1.34 and a two-tailed p-value of 0.2514, however, indicate that the difference is not statically significant at the 5% level (as $p > 0.05$). Furthermore, validating the insignificance of the rise is the one-tailed p-value of 0.126, which also exceeds the critical value. Therefore, although the ratio got better, the data doesn't back up the change statically.

3) **BOI**

To find the ratio of non-Int. Income to Owner's Fund of BOI, the calculation method is the rate of Non-Int. Income of individual year divided by Owner's Fund of BOI. The ratio has been shown in the table below:

Table 4.83

IMPACT OF DEMONETIZATION ON NON FUND BASE INCOME OF PUBLIC SECTOR BANKS IN INDIA

Ratio Of NII To Owner's Fund Of BOI

(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Owner's Fund	Ratio (%)
2011-12	2641.82	15769.39	16.75%
2012-13	3319.24	19603.59	16.93%
2013-14	3784.6	22692.24	16.67%
2014-15	4319	30130.72	14.33%
2015-16	4287.07	31857.19	13.45%
2016-17	**3671.61**	**31224.72**	**11.75%**
2017-18	6819.43	30851.91	22.10%
2018-19	5845.89	35012.76	16.69%
2019-20	5264.03	40253.92	13.07%
2020-2021	6808.89	35424.25	19.22%
Average	4676.15	29282.06	16.10%
S.D.	1449.85548	7632.02148	0.03087203
C.V.%	31.08	26.06	19.18

Source: Annual Reports And Accounts Of BOI For The Period Under Study

Over the years 2011–12 to 2020–21, the bank's Non-Int. Income to Owner's Fund ratio shows significant variations. The highest ratio was noted in 2017–18 at 22.10%, showing a noticeable increase in non-interest revenue in relation to the bank's own capital, most likely as a result of better fee-based services or other non-lending activities. Conversely, the lowest ratio—11.75% in 2016–17—indicates a decrease in non-interest revenue generating efficiency. The ratio varied from 11.75% to 22.10% over the decade, pointing to changes in income composition and business plan. With an average ratio of 16.10%, non-Int. Income seems to make a fair and regular contribution to the owner's fund.

A standard deviation (S.D.) of 3.09% and a coefficient of variation (C.V.) of 19.18% indicate a moderate degree of volatility; this means that although the ratio stayed

fairly constant, there were years of either dramatic rises or drops. This diversity may result from policy changes, internal corporate focus shifts, or external economic events. With some years showing better performance in using this income stream than others, the bank seems to depend on non-Int. Income as a backup revenue source. The trend generally emphasizes how crucial it is to have a balanced and varied income source for financial stability.

Table 4.84

- **T-Test Paired Two Sample For Means**

(RATIO 4 BOI) T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.15626	0.16566
Variance	0.000261708	0.001828
Observations	5	5
Pearson Correlation	0.024882433	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-0.46369093	
P(T<=t) one-tail	0.333489131	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.666978261	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

For BOI, a paired sample t-test was run to contrast the Ratio of Non-Int. Income to Owner's Fund between two periods. The mean somewhat rose from 0.15626 (Variable 1) to 0.16566 (Variable 2), but the t-statistic of -0.464 and a two-tailed p-value of 0.667 suggest that the change is not statically significant. At the 5% significance level, both one-tailed and two-tailed p-values exceed their respective critical values, implying no significant variation in the ratio between the two periods. Therefore, the

findings suggest that the apparent growth is probably attributable to chance variation rather than a real underlying difference.

4) **BOM**

To find the ratio of non-Int. Income to Owner's Fund of BOM, the calculation method is the rate of Non-Int. Income of individual year divided by Owner's Fund of BOM. The ratio has been shown in the table below:

Table 4.85
Ratio Of NII To Owner's Fund Of BOM
(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Owner's Fund	Ratio (%)
2011-12	536.1	2914.57	18.39%
2012-13	647.57	3564.41	18.17%
2013-14	922.35	4056.11	22.73%
2014-15	907.36	4917.01	18.45%
2015-16	1020.31	6043.49	16.88%
2016-17	**1037.17**	**6396.01**	**16.21%**
2017-18	1524.81	6300.58	24.20%
2018-19	1539.73	7468.52	20.61%
2019-20	1568.23	3129.91	50.10%
2020-2021	1650.23	3820.55	43.19%
Average	1135.38	4861.11	24.89%
S.D.	406.193798	1592.55275	0.11842853
C.V.%	35.77	32.57	47.57

Source: Annual Reports And Accounts Of BOM For The Period Under Study

Between 2011–12 and 2020–21, the Ratio of Non-Int. Income to Owner's Fund exhibits a fluctuating trend that mirrors the bank's varying success in producing revenue from non-lending sources in relation to its owned capital. For most years, the ratio ranged from roughly 16% to 24%, but in 2019–20 (50.10%) it showed a sharp rise and remained high in 2020–21 (43.19%). These two years stick out because, while non-Int. Income stayed strong, the owner's fund saw a sharp drop, most likely as a result of losses or provisioning. In 2016–17, the lowest ratio was 16.21%, and the highest ratio in this period was 50.10%.

With an average ratio of 24.89% over the 10-year period, it is clear that non-Int. Income plays a somewhat important role in the owner's fund. However, a very high coefficient of variation (47.57%) and the standard deviation (11.84%) suggest significant fluctuation in the ratio year over year. This great variation suggests fluctuation in either the capital base or the income sources. The abrupt rises in the previous two years may point to restructuring or strange financial activity. Non-Int. Income has usually helped the bank's financial condition overall, but the big swings need more research into the root reasons and maybe changes in policies or procedures.

- **T-Test Paired Two Sample For Means**

(RATIO 4 BOM) T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.18924	0.30862
Variance	0.000493548	0.022156
Observations	5	5
Pearson Correlation	-0.457303568	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-1.665974353	
P(T<=t) one-tail	0.085523859	
t Critical one-tail	2.131846786	

P(T<=t) two-tail	0.171047717	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

A paired sample t-test was performed to examine the ratio of Non-Int. Income to Owner's Fund at the BOM across two different time frames. The average rose from 0. 18924 to 0. 30862, reflecting a significant upsurge. Nevertheless, the t-statistic of -1. 666 and a two-tailed p-value of 0. 171 imply that this rise does not reach statistical significance at the 5% threshold. Likewise, the one-tailed p-value of 0. 0855 is above the critical limit of 0. 05, indicating that the difference noted could be attributable to random chance. Thus, even though the ratio has improved, the change lacks statistical support.

5) **Central Bank Of India**

To find the ratio of non-Int. Income to Owner's Fund of Central Bank Of India, the calculation method is the rate of Non-Int. Income of individual year divided by Owner's Fund of Central Bank Of India. The ratio has been shown in the table below:

Table 4.87
Ratio Of NII To Owner's Fund of Central Bank Of India
(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Owner's Fund	Ratio (%)
2011-12	1239.49	5029.6	24.64%
2012-13	1409.37	8412.28	16.75%
2013-14	1676.67	11009.28	15.23%
2014-15	1931.38	11202.64	17.24%
2015-16	1900.39	14262.54	13.32%
2016-17	**1944.47**	**12990.51**	**14.97%**
2017-18	2871.47	15626.26	18.37%
2018-19	2620.41	15592.21	16.80%

2019-20	2416.33	15136.29	15.96%
2020-2021	3622.4	15826.74	22.88%
Average	2163.238	12508.835	17.62%
S.D.	725.1735804	3607.40865	0.035444
C.V.%	33.52	28.58	20.12

Source: Annual Reports And Accounts Of CBI For The Period Under Study

The proportion of Non-Int. Income to Owner's Fund for the bank between 2011-12 and 2020-21 demonstrates a moderately variable pattern. In 2011-12, the ratio reached its highest point at 24. 64%, signifying robust non-Int. Income in relation to the bank's own funds that year. The ratio hit its lowest at 13. 32% in 2015-16, indicating a lesser impact from non-Int. Income sources on the bank's capital during that time. Nevertheless, following a downward trend, the ratio began to recover, especially in 2020-21 (22. 88%), pointing to an improvement in non-Int. Income or a relatively minor growth in owner's fund. The ratio fluctuated between 13. 32% and 24. 64%, underlining different degrees of reliance on income from non-lending activities.

Throughout the ten years, the mean ratio was 17. 62%, showing a reasonable input of non-Int. Income to the bank's financial foundation. A standard deviation of 3. 54% and a coefficient of variation of 20. 12% suggest a moderate level of variation, reflecting some irregularities in performance without extreme instability. This variability may be linked to evolving business models, economic fluctuations, or changes in the regulatory and competitive landscapes. All in All , the bank has preserved a relatively steady stance in leveraging non-Int. Income to bolster its owned capital, with intermittent advancements indicating initiatives toward income diversification.

Table 4.88

- **T-Test Paired Two Sample For Means**

(Central Bank) Ratio 4 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**

Mean	0.17436	0.17796
Variance	0.001855363	0.000963
Observations	5	5
Pearson Correlation	-0.7316273	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-0.116498693	
P(T<=t) one-tail	0.456436076	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.912872152	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

A paired sample t-test was performed to analyze the Ratio of Non-Int. Income to Owner's Fund over two different time frames. The average rose just a bit from 0. 17436 to 0. 17796, but the t-statistic of -0. 1165 and the two-tailed p-value of 0. 9129 suggest that this difference lacks statistical significance. Both one-tailed and two-tailed p-values are significantly above their respective critical thresholds, indicating that the noted difference is probably a result of random fluctuations. As a result, there is no meaningful change in the ratio between the two periods.

6) Canara Bank

To find the ratio of non-Int. Income to Owner's Fund of Canara Bank, the calculation method is the rate of Non-Int. Income of individual year divided by Owner's Fund of Canara Bank. The ratio has been shown in the table below:

Table 4.89

Ratio Of NII To Owner's Fund Of Canara Bank

(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Owner's Fund	Ratio (%)
2011-12	2668.49	17859.72	14.94%
2012-13	3104.51	20535.26	15.11%

2013-14	3307.65	22700.19	14.57%
2014-15	4143.68	24216.75	17.11%
2015-16	4733.45	26610.66	17.78%
2016-17	**5131.26**	**26422.02**	**19.42%**
2017-18	7852.26	28714.96	27.34%
2018-19	7398	29639.72	24.95%
2019-20	7372.41	30487.82	24.18%
2020-2021	11799.4	33842.93	34.86%
Average	5751.111	26103.00	21.03
S.D.	2844.46275	4863.83282	0.066563
C.V.%	49.45	18.63	31.65

Source: Annual Reports And Accounts Of Canara Bank For The Period Under Study

The proportion of Non-Int. Income to Owner's Fund for the bank between 2011-12 and 2020-21 clearly shows an increase, indicating a notable enhancement in the bank's capacity to earn income from non-lending avenues in relation to its own equity. Beginning at 14. 94% in 2011-12, the ratio progressively grew year after year, reaching its highest point at 34. 86% in 2020-21. This rise implies a heightened dependence on and effectiveness in securing fee-based and other forms of non-Int. Income. The significant increase starting from 2016-17 suggests a strategic change or the impact of external factors, including policy adjustments or a stronger emphasis on digital and service-oriented options. This growth also highlights better operational efficiency and diversification of income sources.

The mean ratio for this time frame is 21. 03%, indicating a solid role of non-Int. Income within the capital framework. Nevertheless, a standard deviation of 6. 66% and a coefficient of variation (C. V.) of 31. 65% reveal moderate to high fluctuations, pointing to the fact that the increase in the ratio was not entirely linear and could have been influenced by varying market or institutional circumstances. While the owner's fund increased at a relatively steady rate (C. V. of 18. 63%), the elevated C. V. in non-Int. Income (49. 45%) suggests greater instability in earnings from non-conventional

sources. In summary, the information indicates a favorable trend in income diversification, yet the bank may need to address volatility to maintain stable long-term results.

Table 4.90

- **T-Test Paired Two Sample For Means**

(Canara Bank) Ratio 4 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.15902	0.2615
Variance	0.000207827	0.00319735
Observations	5	5
Pearson Correlation	0.647346651	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-4.72726415	
P(T<=t) one-tail	0.004561247	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.009122495	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

A paired sample t-test was performed to analyze variations in the Ratio of Non-Int. Income to Owner's Fund between two different time frames. The average rose notably from 0. 15902 to 0. 2615, signifying enhanced performance. The t-statistic of -4. 73 is considerable, and the two-tailed p-value of 0. 0091 is significantly lower than the 0. 05 significance cut-off, establishing that the rise is statically meaningful. This finding is reinforced by the one-tailed p-value of 0. 0046, which also remains beneath the critical level. Hence, it can be inferred that Canara Bank witnessed a meaningful enhancement in this ratio during the two reviewed periods.

7) Indian Bank

To find the ratio of non-Int. Income to Owner's Fund of Indian Bank, the calculation method is the rate of Non-Int. Income of individual year divided by of Owner's Fund Indian Bank. The ratio has been shown in the table below:

Table 4.91
Ratio Of NII To Owner's Fund Of Indian Bank
(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Owner's Fund	Ratio (%)
2011-12	1188.06	8856.53	13.41%
2012-13	1194.71	10080.57	11.85%
2013-14	1293.4	11263.05	11.48%
2014-15	1378.03	11223.33	12.28%
2015-16	1372.21	12273.15	11.18%
2016-17	**1788.94**	**13228.11**	**13.52%**
2017-18	2222.4	14253.13	15.59%
2018-19	2416.59	15613.71	15.48%
2019-20	1891.43	16140.13	11.71%
2020-2021	3325.5	19170.44	17.35%
Average	1807.127	13210.21	13.39%
S.D.	687.368746	3132.97	0.021046
C.V.%	38.03	23.71	15.72

Source: Annual Reports And Accounts Of Indian Bank For The Period Under Study

The proportion of Non-Int. Income to Owner's Fund for the bank from the fiscal years 2011-12 to 2020-21 exhibits a generally steady trend with a slight increase. It began at 13. 41% in 2011-12 and stayed within the 11–13% bracket for several years, experiencing some declines, including 11. 18% in 2015-16 and 11. 48% in 2013-14. Yet, from 2016-17 onwards, it steadily rose, reaching a high of 17. 35% in 2020-21,

which suggests improved use of non-Int. Income sources like fees, commissions, and treasury functions. The most significant increases were noted in the last few years, likely pointing to strategic moves to broaden income streams beyond those from interest-based loans.

Throughout the decade, the mean ratio was 13. 39%, reflecting a moderate yet consistent addition of non-Int. Income to the bank's capital. A standard deviation of 2. 10% and a coefficient of variation (C. V.) of 15. 72% indicate low to moderate fluctuations, showing relatively stable performance with incremental improvements. In contrast to the more erratic patterns in non-Int. Income (C. V. 38. 03%), the ratio remained fairly stable, illustrating effective use of capital despite variations in income. overall, the information indicates that the bank has gradually enhanced its non-Int. Income avenues, which has positively impacted its financial stability.

Table 4.92

- **T-Test Paired Two Sample For Means**

(Indian Bank) Ratio 4 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.1204	0.1473
Variance	0.000075595	0.000469
Observations	5	5
Pearson Correlation	-0.69311751	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-2.11958917	
P(T<=t) one-tail	0.050694482	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.101388965	

t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

The paired t-test evaluates the average values of two related samples (Variable 1 and Variable 2) for Indian Bank's Ratio 4. The average for Variable 1 is 0. 1204, while for Variable 2, it is 0. 1473. The computed t-statistic stands at -2. 12, which does not meet the critical t-value of ±2. 776 at a 5% significance level (two-tailed). This indicates that there is no statically meaningful difference between the means of the two variables. Even though the one-tailed p-value is 0. 0506, which is just over the 0. 05 limit, it does not provide sufficient evidence to confidently reject the null hypothesis. The two-tailed p-value of 0. 1014 further supports the absence of significance. Therefore, we conclude that there is no notable difference between the two ratio values for Indian Bank during the analyzed timeframe.

8) Indian Overseas Bank

To find the ratio of non-Int. Income to Owner's Fund of Indian Overseas Bank, the calculation method is the rate of Non-Int. Income of individual year divided by Owner's Fund of Indian Overseas Bank. The ratio has been shown in the table below:

Table 4.93

Ratio Of NII To Owner's Fund Of Indian Overseas Bank

(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Owner's Fund	Ratio (%)
2011-12	1225.1	9324.93	13.14%
2012-13	1681.04	11927.65	14.09%

2013-14	1972.91	13457.36	14.66%
2014-15	2209.52	16170.17	13.66%
2015-16	2138.6	15641.02	13.67%
2016-17	**2528.26**	**15665.82**	**16.13%**
2017-18	3372.64	13744.55	24.53%
2018-19	3746.44	13273.98	28.22%
2019-20	4206.32	16359.88	25.71%
2020-2021	3306.37	16154.98	20.46%
Average	2638.7	14172.03	18.43
S.D.	970.34460	2288.431975	0.0579181
C.V.%	36.77	16.14	31.46

Source: Annual Reports And Accounts Of Indian Ove. Bank For The Period Under Study

The proportion of non-interest earnings to the owner's equity at the bank reveals a distinct upward trend in the early years, increasing from 13. 14% in 2011-12 to a high of 28. 22% in 2018-19. This points to an enhanced capacity for generating income through fees and other activities that do not involve loans, in relation to its own equity. This increase suggests that the bank has effectively broadened its range of services, potentially gaining more from transactions or improving its treasury and other non-traditional revenue sources. Following 2018-19, the ratio dropped to 20. 46% in 2020-21, which may indicate external challenges such as an economic downturn, changes in strategy, or a decrease in non-interest profit margins.

Throughout the entire timeframe, the mean ratio stands at 18. 43%, with a standard deviation of 5. 79% and a variation coefficient of 31. 46%. This points to a reasonable level of variability in the contribution of non-Int. Income in comparison to the owner's capital. The owner's equity itself exhibited a more steady growth pattern (C. V. 16.

14%), while non-Int. Income showed greater fluctuations (C. V. 36. 77%), highlighting that changes in the ratio are primarily influenced by variations in non-Int. Income. In summary, although the bank achieved significant progress in diversifying its income until 2018-19, the later decline emphasizes the necessity to bolster and stabilize non-interest revenue streams for maintaining financial stability.

Table 4.94

- **T-Test Paired Two Sample For Means**

(Indian Ov. Bank) Ratio 4 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.13844	0.2301
Variance	3.2153E-05	0.00226453
Observations	5	5
Pearson Correlation	0.872353188	
Hypothesized Mean Difference	0	
df	4	
t Stat	-4.796517176	
P(T<=t) one-tail	0.004335088	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.008670176	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

The paired sample t-test performed on Indian Overseas Bank's Ratio 4 (Non-Int. Income to Owner's Fund) reveals a significant statistical difference between the two time frames being analyzed. Variable 1 has a mean of 0. 13844, whereas Variable 2 has a mean of 0. 2301, indicating a clear rise in the ratio. The computed t-statistic is -4. 7965, surpassing the critical t-value of ±2. 7764 at a 5% significance level for a two-

tailed assessment. additionally, the two-tailed p-value stands at 0. 0087, which is far below the 0. 05 mark required for statistical significance.

This finding indicates that the increase in the ratio is unlikely to be due to randomness, suggesting that there has been a genuine enhancement in the bank's operations. The elevated ratio in the second time frame implies that Indian Overseas Bank has successfully increased the share of its income derived from non-interest ventures in relation to its owner's fund. This development can be perceived positively, reflecting improved income diversification and the possibility of better financial stability in the latter years studied.

9) PNB

To find the ratio of non-Int. Income to Owner's Fund of PNB, the calculation method is the rate of Non-Int. Income of individual year divided by Owner's Fund of PNB. The ratio has been shown in the table below:

Table 4.95

Ratio Of NII To Owner's Fund Of PNB
(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Owner's Fund	Ratio (%)
2011-12	3655.36	22297.85	16.39%
2012-13	4239.51	28864.66	14.68%
2013-14	4302.03	34115.56	12.61%
2014-15	4710.34	38154.26	12.34%
2015-16	6174.6	42217.48	14.62%
2016-17	**6976**	**38566.75**	**18.08%**
2017-18	9167.58	38931.97	23.54%
2018-19	8888.35	38249.21	23.23%

2019-20	7367.39	41015.09	17.96%
2020-2021	9387.66	57770.16	16.25%
Average	6486.88	38018.2	16.9
S.D.	2197.919006	9214.18160	0.0389
C.V.%	33.88	24.23	22.96

Source: Annual Reports And Accounts Of PNB For The Period Under Study

The ratio of Non-Int. Income to Owner's Fund for the specified bank throughout the decade from 2011-12 to 2020-21 exhibits a moderate degree of variability along with a steady enhancement in the efficiency of generating income. The average non-Int. Income for this time frame was ₹6486. 88 crore, whereas the typical owner's fund amounted to ₹38,018. 2 crore, leading to an overall average ratio of 16. 9%. This suggests that about 16. 9% of the bank's owner's funds were involved in generating non-Int. Income, highlighting a notable impact from activities beyond core banking functions. The coefficient of variation for this ratio is 22. 96%, indicating a moderate amount of variation, which points to a reasonable consistency in the bank's capacity to produce non-Int. Income in relation to its owner's funds over the years.

Importantly, the ratio experienced a downward trend from 2011-12 (16. 39%) to 2014-15 (12. 34%), likely due to the growth of owner's funds outpacing increases in non-Int. Income. Nevertheless, starting in 2015-16, the bank saw a resurgence in this ratio, reaching a high of 23. 54% in 2017-18 and continuing to perform strongly in the years that followed. This enhancement may be linked to strategic initiatives focused on diversifying income streams, such as greater dependence on fees, commissions, treasury activities, and service fees. In summary, the information suggests that the bank has fortified its base for non-Int. Income, leading to a decreased reliance on traditional revenue generated from interest.

Table 4.96

- **T-Test Paired Two Sample For Means**

(Punjab Bank) Ratio 4 T-Test: Paired Two Sample For Means

	Variable 1	Variable 2
Mean	0.14128	0.19812
Variance	0.000279117	0.00111746
Observations	5	5
Pearson Correlation	-0.24573701	
Hypothesized Mean Difference	0	
df	4	
t Stat	-3.10916635	
P(T<=t) one-tail	0.017950427	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.035900854	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

This paired t-test evaluates two groups of Ratio 4 data for Punjab Bank. The average of Variable 1 stands at 0. 14128, while Variable 2 has an average of 0. 19812, showing a clear distinction. The t-statistic obtained is -3. 11, surpassing the critical threshold for both one-tailed and two-tailed tests, with the p-value for the two-tailed test being 0. 0359, which is lower than the 0. 05 significance threshold.

There is a meaningful statistical difference between the two averages at the 5% level, suggesting that the variation in Ratio 4 over the two periods is probably not just random chance. Therefore, the performance associated with this ratio has undergone a notable change over time.

10) Union Bank Of India

To find the ratio of non-Int. Income to Owner's Fund of Union Bank Of India, the calculation method is the rate of Non-Int. Income of individual year divided by Owner's Fund of Union Bank Of India . The ratio has been shown in the table below:

Table 4.97

Ratio Of NII To Owner's Fund Of Union Bank Of India

(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Owner's Fund	Ratio (%)
2011-12	2039.72	12297.11	16.58%
2012-13	2316.31	14117.15	16.40%
2013-14	2868.04	16722.39	17.15%
2014-15	3140.73	16544.67	18.98%
2015-16	3957.12	17838.68	22.18%
2016-17	**3934.43**	**19779.43**	**19.89%**
2017-18	5429.98	20426.84	26.58%
2018-19	5462.08	21741.36	25.12%
2019-20	5041.71	22733.82	22.17%
2020-2021	5789.27	27288.43	21.21%
Average	3997.93	18948.98	20.63%
S.D.	1381.321883	4398.328911	0.035015685
C.V.%	34.55	23.21	16.97

Source: Annual Reports And Accounts Of UBOI For The Period Under Study

The information outlines the ratio of non-Int. Income to owner's funds for a bank from the fiscal years 2011–12 to 2020–21. During this time frame, the non-Int. Income increased consistently, rising from ₹2039. 72 crore to ₹5789. 27 crore, while the owner's funds also saw growth from ₹12,297. 11 crore to ₹27,288. 43 crore. Although there were some variations, the ratio of non-Int. Income to owner's funds has remained robust, with an average of 20. 63% over the decade. This indicates that the

bank has effectively sustained its ability to produce non-Int. Income relative to its equity, positively impacting its financial viability.

The coefficient of variation (C. V.) for this ratio is fairly low at 16. 97%, which signifies a moderate level of consistency in its performance. In comparison, the non-Int. Income has a C. V. of 34. 55%, and owner's funds stand at 23. 21%, showing that the ratio is more stable. This suggests that despite fluctuations in income and capital, the bank has successfully maintained a relatively constant non-Int. Income return based on its equity. Such consistency demonstrates effective fund management and a variety of income streams beyond conventional interest revenue.

Table 4.98

- **T-Test Paired Two Sample For Means**

(Union Bank) Ratio 4 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.18258	0.22994
Variance	0.000584972	0.000771893
Observations	5	5
Pearson Correlation	-0.424191541	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-2.412468761	
P(T<=t) one-tail	0.036679214	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.073358429	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

Over five observations, a paired t-test was used to contrast Ratio 4 values of Union Bank between two linked groups—Variable 1 and Variable 2. Variable 1 has a mean of 0.1826; Variable 2 has a mean of 0.2299. The t-statistic is -2.41, and the two-tailed p-value is 0.0734.

Because the p-value (0.0734) > 0.05, the outcome is not statically significant at the 5% level. Ratio 4 shows no clear indication of a notable difference between the two variables, even if the outcome is somewhat near to significance.

11) <u>UCO Bank</u>

To find the ratio of non-Int. Income to Owner's Fund of UCO Bank , the calculation method is the rate of Non-Int. Income of individual year divided by Owner's Fund of UCO Bank. The ratio has been shown in the table below:

Table 4.99

Ratio Of NII To Owner's Fund Of UCO Bank
(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Owner's Fund	Ratio (%)
2011-12	925.41	7419.22	12.47%
2012-13	965.55	8613.43	11.20%
2013-14	952.17	9682.41	9.83%
2014-15	1320.51	11226.29	11.76%
2015-16	2003.55	12548.96	15.96%
2016-17	**1596.31**	**11586.95**	**13.77%**
2017-18	2114.49	11603.47	18.22%
2018-19	1121	9825.18	11.40%
2019-20	1513.51	13794.37	10.97%
2020-2021	2871.21	19209.62	14.94%

Average	1538.371	11550.99	13.05%
S.D.	632.2691117	3282.336266	0.026273722
C.V.%	41.10	28.41	20.13

Source: Annual Reports And Accounts Of UCO Bank For The Period Under Study

For the provided 10-year period (2011–12 to 2020–21), the Non-Int. Income to Owner's Fund ratio exhibits obvious variations, ranging from a low of 9.83% in 2013–14 to a high of 18.22% in 2017–18. The average ratio over the period is 13.05%, which shows that Union Bank typically produced roughly 13% of non-Int. Income in comparison to its owner's fund. Particularly in years with strong earnings like 2015–16 and 2017–18, this indicates a somewhat healthy contribution of non-core revenue toward bolstering the bank's equity foundation.

For the ratio, the coefficient of variation (C.V.) is 20.13%; this points to a somewhat average degree of performance consistency. Relatively, the owner's fund (C.V. = 28.41%) and non-Int. Income (C.V. = 41.10%) show more volatility. This suggests that the ratio between the two parts remained fairly consistent even if each part changed noticeably. Such stability points to good news for the bank's financial management and diversification of income sources, as it implies good balancing of non-Int. Income generation in relation to capital growth.

Table 4.100

- **T-Test Paired Two Sample For Means**

(Uco Bank) Ratio 4 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.12244	0.1386
Variance	0.000525283	0.0008647
Observations	5	5

Pearson Correlation	0.251439004	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-1.1145819	
P(T<=t) one-tail	0.163739266	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.327478532	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

To examine Ratio 4 readings for two linked UCO Bank samples, a paired sample t-test was run. Variable 1 has a mean of 0.1224; Variable 2's is 0.1386. The computed t-statistic is -1.11; the two-tailed p-value is 0.3275.

The difference between the two means is not statically significant at the 5% level as the p-value (0.3275) is greater than 0.05. This implies that Ratio 4 values for the two samples don't differ much or change significantly, and any variations noticed could be the result of random chance.

12) P&S Bank

To find the ratio of non-Int. Income to Owner's Fund of P&S Bank , the calculation method is the rate of Non-Int. Income of individual year divided by Owner's Fund of Punjab & Sind Bank. The ratio has been shown in the table below:

Table 4.101
Ratio Of NII To Owner's Fund Of P&S Bank
(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Owner's Fund	Ratio (%)
2011-12	437.08	3803.38	11.49%

2012-13	417.46	4248.95	9.82%
2013-14	417.15	4604.1	9.06%
2014-15	427.28	5011.29	8.52%
2015-16	428.75	5596.18	7.66%
2016-17	**478.48**	**5970.22**	**8.01%**
2017-18	578.1	6142.47	9.41%
2018-19	581.2	6182.69	9.40%
2019-20	828.28	5701.4	14.52%
2020-2021	897.39	5594.4	16.04%
Average	549.117	5285.50	10.39%
S.D.	177.2376294	828.9026024	0.0280551
C.V.%	32.27	15.28	26.99

Source: Annual Reports And Accounts Of P& S Bank For The Period Under Study

UCO Bank's Non-Int. Income to Owner's Fund ratio varied significantly over the 10-year period from 2011–12 to 2020–21, ranging from a low of 7.66% in 2015–16 to a high of 16.04% in 2020–21. With 10.39% being the mean ratio, on average roughly 10% of the owner's fund was contributed yearly by non-Int. Income. This points to a somewhat reliance on outside revenue streams. The large increases in the latter years (2019–20 and 2020–21) indicate more attempts to increase fee-based and other non-fund-based income during those years.

Regarding consistency, the ratio's coefficient of variation (C.V.) is 26.99%, which implies a moderate degree of volatility. The non-Int. Income (C.V. = 32.27%) was more volatile than the owner's fund (C.V. = 15.28%), which suggests that the bank's alternative sources of income rather than its equity base vary. This trend emphasizes the importance of having a more stable and strategic plan to increase non-Int. Income

so that there is always enough money available without relying too much on conventional interest-based businesses.

Table 4.102

- **T-Test Paired Two Sample For Means**

(P&S Bank) Ratio 4 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.0931	0.11476
Variance	0.00021054	0.001267183
Observations	5	5
Pearson Correlation	-0.872468966	
Hypothesized Mean Difference	0	
df	4	
t Stat	-0.99298935	
P(T<=t) one-tail	0.188460687	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.376921374	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

For P&S Bank, a paired sample t-test was run to examine Ratio 4 values across two linked samples. Variable 1 has a mean of 0.0931; Variable 2's is 0.1148, a modest rise. The t-statistic, however, is -0.993 and the two-tailed p-value, 0.3769, is significantly above the 0.05 significance threshold.

This suggests that the two means are not statically significantly different from one another. Therefore, there is not enough proof to say that there was a significant change in Ratio 4 values between the two groups of people, and the differences we saw might just be random.

Table 4.103

Ratio of Non-Int. Income to Total Income of All PSBs under Study

(From 2011-12 to 2020-21)

(Ratio in Percentage)

Years	BOB	SBI	BOI	BOM	CBI	canara bank	IOB	PNB	indian bank	UBOI	uco bank	P&S BAN
2011-12	15.33%	41.29%	16.75%	18.39%	24.64%	14.94%	13.14%	16.39%	13.41%	16.58%	12.47%	0.6
2012-13	14.59%	28.26%	16.93%	18.17%	16.75%	15.11%	14.09%	14.68%	11.85%	16.40%	11.20%	0.5

2013-14	13.73%	26.20%	16.67%	22.73%	15.23%	14.57%	14.66%	12.61%	11.48%	17.15%	9.83%	0.5
2014-15	14.84%	25.83%	14.33%	18.45%	17.24%	17.11%	13.66%	12.34%	12.28%	18.98%	11.76%	0.4
2015-16	13.10%	30.69%	13.45%	16.88%	13.32%	17.78%	13.67%	14.62%	11.18%	22.18%	15.96%	0.4
2016-17	**14.25%**	**29.60%**	**11.75%**	**16.21%**	**14.97%**	**19.42%**	**16.13%**	**18.08%**	**13.52%**	**19.89%**	**13.77%**	**0.4**
2017-18	18.62%	37.68%	22.10%	24.20%	18.37%	27.34%	24.53%	23.54%	15.59%	26.58%	18.22%	0.6
2018-19	17.36%	36.91%	16.69%	20.61%	16.80%	24.95%	28.22%	23.23%	15.48%	25.12%	11.40%	0.5
2019-20	15.95%	36.80%	13.07%	50.10%	15.96%	24.18%	25.71%	17.96%	11.71%	22.17%	10.97%	0.7
2020-2021	16.21%	40.80%	19.22%	43.19%	22.88%	34.86%	20.46%	16.25%	17.35%	21.21%	14.94%	0.9

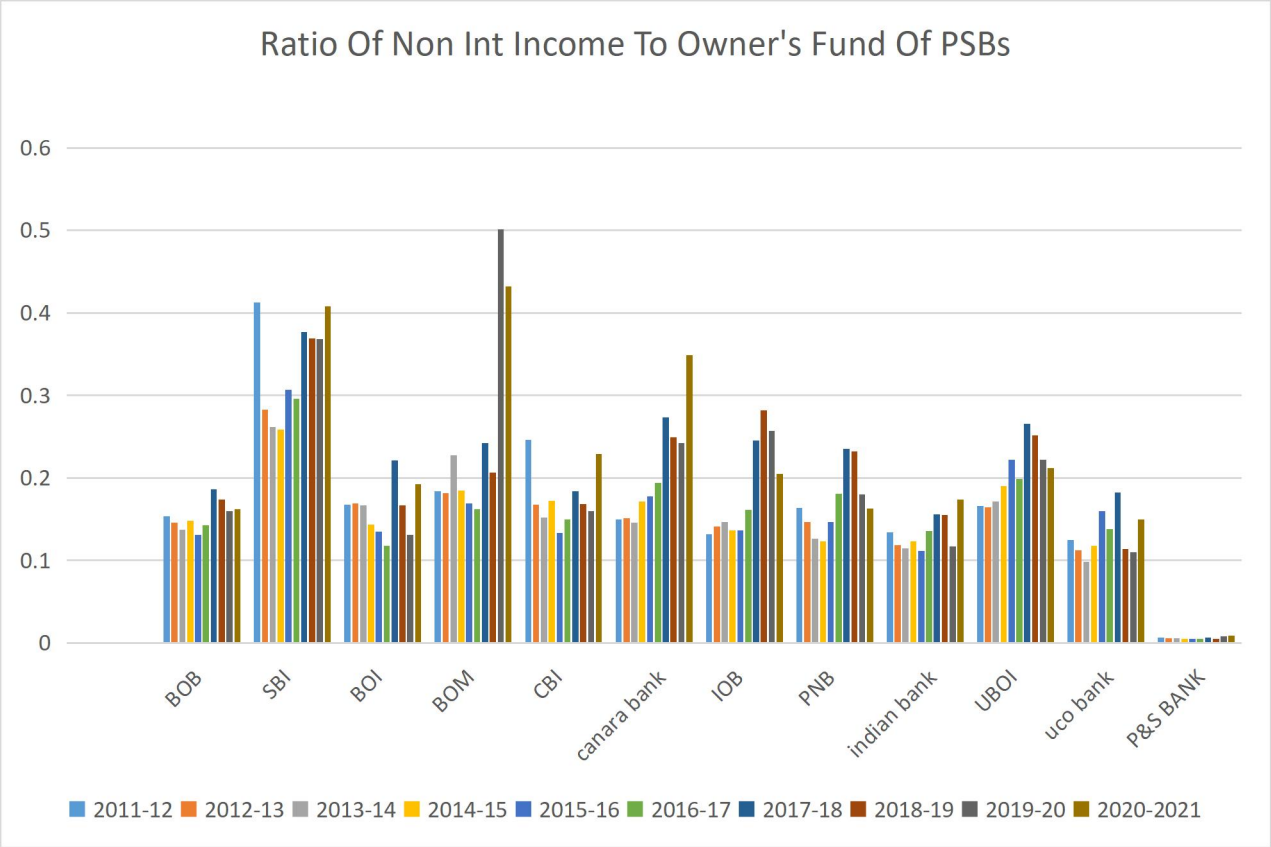
Source: Annual Reports And Accounts Of All PSBs For The Period Under Study

Chart 4.4

Ratio of Non-Int. Income to Total Income of All PSBs under Study

(From 2011-12 to 2020-21)

(Ratio in Percentage)



The chart makes it clear that the ratio varies a lot between different banks and over time. In recent years like 2019-20 and 2020-21, some banks like BOM (BOM) and SBI show comparatively high and increasing ratios, which point to better use of investments to produce non-Int. Income. Conversely, banks like P&S Bank and UCO Bank show consistently lower ratios, suggesting that,their investments, non-Int. Income offers little support. The pattern indicates that while some PSBs have improved in diversifying their income streams, others still depend more on conventional Int. Income. This erratic performance highlights the need of careful reforms and creativity in investment and income generation among struggling banks.

- **<u>Two Way Anova Test Is Applied For PSBs Under Study (F Test)</u>**

Two-way F-test has been applied to study impact of demonetization on PSBs with the following hypothesis :

1) **Null Hypothesis (Ho):** Under this study, there is no significant difference

in the non-Int. Income to Owner's Fund ratio between the banks.

2) **Null Hypothesis (Ho):** Under this study, there is no significant year-wise difference in the non-Int. Income to Owner's Fund ratio within the banks.

Table 4.104

ANOVA TABLE

Source	Sum	Degree Of Freedom (d.f.)	Variance (Sum/d.f.)	F Ratio
Between Banks(SSC)	0.6597	(c-1) = (12-1) =11	0.060	31.57
Within Banks (SSR)	0.1008	(r-1) = (10-1) = 9	0.0112	5.89
Error (SSE)	0.1845	(c-1) (r-1) = 99	0.0019	

Data is calculated by the researcher

1) **F Test Between the Banks**

V1 = 11, V2 = 99

Table value of F at 5 % level of significance = 1.89

$F = \frac{\text{Higher Variance}}{\text{Smaller Variance}}$ $F = \frac{0.060}{0.0019} = 31.57$

To see if the variances of two banks differed significantly, an F-test was run. The null hypothesis held that the variances were not significantly different—that is, they were equal—while the alternative hypothesis held that the variances were significantly different. The computed F-value of 31.57 greatly exceeds the critical F-value of 1.89 at the 5% level of significance with degrees of freedom V1 = 11 and V2 = 99.

The null hypothesis is refuted since the estimated F-value surpasses the threshold value. This suggests that the variances in the financial ratios or performance measures between the two banks are statically significantly different, hence their variability is not identical.

2) **F Test Within the Banks**

V1 = 9, V2 = 99

Table value of F at 5 % level of significance = 1.98

$$F = \frac{\text{Higher Variance}}{\text{Smaller Variance}} \qquad F = \frac{0.0112}{0.0019} = 5.89$$

Within one bank, an F-test was run to determine if two sets of internal data (including ratio components or different time periods) have noticeably different variances. According to the null hypothesis, there is no major difference in the variances, but the alternative hypothesis says there is. At the 5% level of significance with degrees of freedom V1 = 9 and V2 = 99, the calculated F-value of 5.89 exceeds the critical F-value of 1.98.

The null hypothesis is rejected as the determined F-value is higher than the critical value. This suggests that there is a statically significant difference in variances within the bank, which means that the financial data being compared is not the same throughout the bank. This could show that the bank's performance, risk exposure, or income consistency has changed over time.

4.6.5 Ratio Of NII To Long Term Fund Of The Banks Under Study

An essential financial indicator for evaluating how well banks produce non-core income in relation to their long-term sources of financing is the ratio of non-Int. Income to long-term fund. The ratio shows how well the bank can use stable funding, like equity and long-term loans, to make money from things other than lending, such as fees, commissions, and trading gains. Crucial for financial sustainability and resilience in a competitive banking landscape, a greater ratio points to improved diversification of income sources and less reliance on conventional interest-based earnings.

Ratio Of NII To Total Income $= \frac{\text{Non Interest Income}}{\text{Long Term Fund}} * 100$

In the table below the ratio of the study for All the banks has been shown :

PUBLIC SECTOR BANKS

1) **BOB**

   Ratio of NII to Long Term Fund of BOB is calculated by the rate of NII of individual year divided by Long Term Fund.

Table 4.105

Ratio Of NII To Long Term Fund Of BOB

(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Long Term Fund	Ratio(%)
2011-12	3287.1	355881.1	0.92%
2012-13	4100.42	444821.4	0.92%
2013-14	4510.62	542583.7	0.83%
2014-15	5555.15	654978.6	0.84%
2015-16	5449.27	707687.1	0.77%
2016-17	**5992.17**	**663532.6**	**0.90%**
2017-18	7936.78	691799	1.14%
2018-19	7992.21	719150.4	1.11%
2019-20	7887.05	789793.7	0.99%
2020-2021	12191.33	1145453	1.06%
Average	6490.2	671568.082	0.95%
S.D.	2601.243797	213586.2022	0.001240788
C.V. %	40.08	31.80	13.08

Source: Annual Reports And Accounts Of BOB For The Period Under Study

The ratio of non-Int. Income to long-term fund has been rather constant over the 10-year period from 2011-12 to 2020-21, averaging 0.95%. The ratio varied only slightly, ranging from a low of 0.77% in 2015-16 to a peak of 1.14% in 2017-18. This implies that, in line with their long-term funding base, banks have kept a consistent amount of non-Int. Income. The modest increase in the later years, particularly in 2020–21 (1.06%), may indicate either better diversification of income sources or strategic

focus on non-core revenue streams including investment income and fee-based services.

The ratio's coefficient of variation (C.V.) is 13.08%, which indicates a great level of consistency in this metric with regard to the individual components—non-Int. Income (C.V. = 40.08%) and long-term fund (C.V. = 31.80%). The relative stability of the ratio over time indicates good financial management in matching non-Int. Income generation with long-term capital resources, even if there have been big changes in income and the amount of money available. Less reliance on interest-based revenue helps banks improve their general financial condition.

Table 4.106

- **T-Test Paired Two Sample For Means**

(RATIO 5 BOB) t-Test: Paired Two Sample for Means		
	Variable 1	**Variable 2**
Mean	0.00856	0.0104
Variance	0.000000413	9.35E-07
Observations	5	5
Pearson Correlation	-0.21322349	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-3.23955712	
P(T<=t) one-tail	0.015843624	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.031687247	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

Two linked Ratio 5 samples from BOB (BOB) were compared using a paired t-test. While Variable 2 has a somewhat higher mean of 0.0104, Variable 1 has a mean of 0.00856. The computed t-statistic is -3.24 with a two-tailed p-value of 0.0317.

Given that the p-value (0.0317) fall s below 0.05, the conclusion is statically significant at the 5% level. Consequently, the null hypothesis is rejected as the two means differ significantly. This implies a significant shift in Ratio 5 values for BOB across the given periods.

2) **SBI**

To find the ratio of non-Int. Income to Long Term Fund of SBI, the calculation method is the rate of Non-Int. Income of individual year divided by Long Term Fund of SBI.

Table 4.107

Ratio Of NII To Long Term Fund Of SBI

(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Long Term Fund	Ratio(%)
2011-12	34207.48	1484481.67	2.30%
2012-13	29835.43	1682637.04	1.77%
2013-14	32581.69	1960412.99	1.66%
2014-15	37882.13	2214891.75	1.71%
2015-16	49315.17	2464508.91	2.00%
2016-17	**52828.39**	**2698931.72**	**1.95%**
2017-18	68129.96	3159849.12	2.16%
2018-19	75521.03	3326194.81	2.27%
2019-20	76898.74	3594821.37	2.14%
2020-2021	92377.43	3866065.24	2.38%
Average	54957.74	2645279.46	2.03%

S.D.	22031.1332	822215.13	0.002573454
C.V.%	40.09	31.08	12.65

Source: Annual Reports And Accounts Of SBI For The Period Under Study

From 2011-12 to 2020-21, the Ratio of Non-Int. Income to Long-Term Fund for the banks under analysis has stayed somewhat constant, with an average ratio of 2.03%. Indicating a steady contribution of non-Int. Income in relation to long-term funds, the ratio varied within a limited range—from a low of 1.66% in 2013–14 to a high of 2.38% in 2020–21. The steady growth in non-Int. Income over time, particularly following 2015–16, points to a deliberate move towards boosting non-core sources of income like fees, commissions, and investment returns, therefore enhancing income diversification and lowering reliance on conventional lending.

At 12.65%, the coefficient of variation (C.V.) for the ratio indicates a strong level of consistency in the connection between non-interest revenue and long-term funds. On the other hand, long-term funds (C.V. = 31.08%) and non-Int. Income (C.V. = 40.09%) exhibit somewhat more volatility. This suggests good financial management and resource use over the decade, as banks have kept a balanced ratio between the two despite major year-on-year changes in the actual values of income and funding.

Table 4.108

- **T-Test Paired Two Sample For Means**

(RATIO 5 SBI) T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.01888	0.0218
Variance	0.000006997	2.58E-06
Observations	5	5
Pearson Correlation	-0.49120356	
Hypothesized Mean Difference	0	

Df	4	
t Stat	-1.761338716	
P(T<=t) one-tail	0.076488807	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.152977615	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

A paired t-test was performed to analyze two related samples of Ratio 5 from the SBI. The average for Variable 1 is 0. 01888, while Variable 2 has a slightly higher average of 0. 0218. The derived t-statistic is -1. 76, accompanied by a two-tailed p-value of 0. 153.

Because the p-value of 0. 153 exceeds 0. 05, the findings do not reach statistical significance. As a result, the null hypothesis is retained, suggesting that there is no notable difference between the means of the two ratios. The variations seen might stem from random changes instead of a substantial difference.

3) **BOI**

To find the ratio of non-Int. Income to Long Term Fund of BOI, the calculation method is the rate of Non-Int. Income of individual year divided by Long Term Fund of BOI. The ratio has been shown in the table below:

Table 4.109
Ratio Of NII To Long Term Fund Of BOI
(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Long Term Fund	Ratio(%)

2011-12	2641.82	339268.1	0.78%
2012-13	3319.24	373008.4	0.89%
2013-14	3784.6	443044.8	0.85%
2014-15	4319	557980.3	0.77%
2015-16	4287.07	607271.8	0.70%
2016-17	**3671.61**	**600269.4**	**0.61%**
2017-18	6819.43	615553.8	1.11%
2018-19	5845.89	603510.8	0.96%
2019-20	5264.03	614634.3	0.85%
2020-2021	6808.89	642363.5	1.06%
Average	4676.158	539690.506	0.86%
S.D.	1449.85548	111480.228	0.001549767
C.V.%	31	20.65	31.06

Source: Annual Reports And Accounts Of BOI For The Period Under Study

A ten-year period analysis of Non-Int. Income (NII) as a percentage of Long-Term Funds from 2011–12 to 2020–21 shows a varying trend with a mean NII ratio of 0.86%. The ratio fell to its lowest point in 2016–17 (0.61%), the year of demonetization, which shows that non-fund revenue production capacity temporarily decreased. However, the following years (2017–18 and 2020–21) showed a clear recovery, with the ratio rising to 1.11% and 1.06%, respectively, implying a possible positive influence of digitalization and diversification of services post-demonetization. Even if income levels have gone up, the ratio's unpredictability shows that using income sources other than those based on funds is not done in a consistent way.

At 31.06%, the coefficient of variation (C.V.) for the NII ratio indicates a great level of performance variability across the time frame. The long-term funds, on the other hand, have a somewhat lower volatility (C.V. = 20.65%), which suggests that the base fund size stayed more consistent than income generation. The standard deviation for the NII ratio is low (0.00155), but it still shows erratic year-over-year performance given the small base percentage. overall, this study indicates that although PSBs could

boost non-interest revenue, their performance has been inconsistent and the post-demonetization improvements have not been sustained consistently across the years.

Table 4.110

- **T-Test Paired Two Sample For Means**

(RATIO 5 BOI) T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.00798	0.00918
Variance	0.000000547	3.96E-06
Observations	5	5
Pearson Correlation	0.227362813	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-1.370198741	
P(T<=t) one-tail	0.121246975	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.24249395	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

A paired sample t-test was conducted to compare the Ratio 5 values of BOI before and after demonetization. The mean values were 0.00798 (pre) and 0.00918 (post), indicating a slight increase. However, the calculated t-statistic (-1.37) is less than the critical value (±2.776) and the p-value (two-tail) is 0.242, which is greater than 0.05, suggesting that the difference is not statically significant. Thus, there is no strong evidence to conclude that demonetization had a significant impact on this ratio for BOI.

4) BOM

To find the ratio of non-Int. Income to Long Term Fund of BOM, the calculation method is the rate of Non-Int. Income of individual year divided by Long Term Fund of BOM. The ratio has been shown in the table below:

Table 4.111
Ratio Of NII To Long Term Fund Of BOM
(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Long Term Fund	Ratio(%)
2011-12	536.1	73899.74	0.72%
2012-13	647.57	877088.7	0.07%
2013-14	922.35	113633.5	0.81%
2014-15	907.36	132529.8	0.68%
2015-16	1020.31	141359.8	0.72%
2016-17	**1037.17**	**157068.2**	**0.66%**
2017-18	1524.81	154645.8	0.98%
2018-19	1539.73	153097.3	1.00%
2019-20	1568.23	156668.5	1.00%
2020-2021	1650.23	164629.2	1.00%
Average	1135.386	212462.055	0.76%
S.D.	406.1937984	235106.6329	0.00282693
C.V.%	35.77	110.65	37

Source: Annual Reports And Accounts Of BOM For The Period Under Study

Over the ten-year period, Non-Int. Income (NII) and Long-Term Funds data show that the NII ratio—which captures the proportion of income from non-fund sources relative to long-term funds—has progressively improved in recent years, particularly

after 2016–17 (post-demonetization period). Early on, the ratio stayed below 0.75%; however, it rose significantly from 2017–18 on and continuously reached 1.00% between 2018–19 and 2020–21. This implies that the bank's fee-based or non-Int. Income relative to its fund base in the later years grew more efficient, probably profiting from more digital services, remittances, and third-party product distribution.

Still, the data's general fluctuation is rather large. With a coefficient of variation (C.V.) of 37% for the NII ratio, performance varies considerably throughout the decade. With 110.65%, the C.V. for long-term funds is quite high, indicating a possible data anomaly or a structural change in fund reporting following the abrupt spike in 2012–13. Though the NII ratio has a low standard deviation (0.0028), this still denotes significant year-to-year fluctuation as the ratio values are tiny percentages. In conclusion, the general picture shows contradiction and uncertainty, indicating the need for more targeted and consistent activities in increasing and stabilizing non-fund revenue streams even if recent years show good and stable performance.

Table 4.112

- **T-Test Paired Two Sample For Means**

(RATIO 5 BOM) T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.006	0.00928
Variance	0.000009005	2.25E-06
Observations	5	5
Pearson Correlation	-0.167656695	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-2.052647699	
P(T<=t) one-tail	0.054680535	

t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.109361071	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

BOM's Ratio 5 was subjected to a paired sample t-test both before and following demonetization. The mean rose from 0.006 (pre) to 0.00928 (post), indicating a potential improvement. The t-statistic (-2.05), though, is less than the crucial value (±2.776), and the two-tailed p-value is 0.109, which is higher than 0.05. Thus, the difference is not statically significant, and we cannot say that demonetization significantly affected this ratio for BoM.

5) **Central Bank Of India**

To find the ratio of non-Int. Income to Long Term Fund of Central Bank Of India, the calculation method is the rate of Non-Int. Income of individual year divided by Long Term Fund of Central Bank Of India. The ratio has been shown in the table below:

Table 4.113
Ratio Of NII To Long Term Fund Of Central Bank Of India
(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Long Term Fund	Ratio(%)
2011-12	1239.49	203293.95	0.60%
2012-13	1409.37	221842.75	0.63%
2013-14	1676.67	260179.93	0.64%
2014-15	1931.38	278522.09	0.69%
2015-16	1900.39	299807.88	0.63%
2016-17	**1944.47**	**294732.07**	**0.65%**
2017-18	2871.47	325178.58	0.88%

2018-19	2620.41	319630.44	0.81%
2019-20	2416.33	325390.54	0.74%
2020-2021	3622.4	341859	1.06%
Average	2163.2	287043.72	0.73
S.D.	725.173580	46275.57762	0.001456
C.V.%	33.52	16.12	19.86

Source: Annual Reports And Accounts Of CBI For The Period Under Study

The ten-year period from 2011–12 to 2020–21 saw a slow rise in the proportion of non-Int. Income to long-term funds for the bank examined. Starting at 0.60% in 2011–12, the ratio gradually reached a peak of 1.06% by 2020–21, showing a notable increase in non-fund-based earnings in relation to long-term financial resources. This upward trend is evidence of the bank's increasing focus on broadening its income streams beyond conventional Int. Income, most likely via service fees, commissions, and charges. The average ratio in this time was 0.73%, with big increases in 2017–18 and 2020–21, which shows how well strategic changes or market chances can work.
The C.V. (coefficient of variation) for the ratio is 19.52%, which implies moderate variations over time in terms of variability. Comparatively, the Non-Int. Income has a higher C.V. of 33.52%, indicating more year-to-year variation in absolute non-interest earnings, whereas the Long-Term Fund base is relatively more stable with a C.V. of 16.12%. This implies that while the bank's long-term fund base grew steadily, the non-Int. Income experienced more volatility—potentially due to changing market conditions, regulatory shifts, or internal policy changes. overall, the trend shows a positive movement toward income diversification, though consistency in generating non-Int. Income remains an area for improvement.

Table 4.114

- **T-Test Paired Two Sample For Means**

(Central Bank) Ratio 5 T-Test: Paired Two Sample For Means

	Variable 1	Variable 2
Mean	0.00638	0.00828
Variance	0.000000107	0.000002407
Observations	5	5
Pearson Correlation	-0.005911413	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-2.676321807	
P(T<=t) one-tail	0.02772008	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.055440161	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

To examine Ratio 5 of Central Bank across two scenarios, a paired t-test was run. With a one-tailed p-value of 0.0277, less than the critical value (0.05), indicating a statically significant difference at the 5% level in the one-tailed test, the mean of Variable 1 (0.00638) is somewhat lower than that of Variable 2 (0.00828). The computed t-statistic is -2.676. The two-tailed p-value of 0.055, somewhat higher than 0.05, though, indicates marginal significance. Under a one-tailed hypothesis, the findings imply that Variable 2 could have much greater values than Variable 1.

6) Canara Bank

To find the ratio of non-Int. Income to Long Term Fund of Canara Bank, the calculation method is the rate of Non-Int. Income of individual year divided by Long Term Fund of Canara Bank. The ratio has been shown in the table below:

Table 4.115

Ratio Of NII To Long Term Fund Of Canara Bank

IMPACT OF DEMONETIZATION ON NON FUND BASE INCOME OF PUBLIC SECTOR BANKS IN INDIA

(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Long Term Fund	Ratio(%)
2011-12	2668.49	328104.2	0.81%
2012-13	3104.51	365713.4	0.84%
2013-14	3307.65	401448.3	0.82%
2014-15	4143.68	478403.2	0.86%
2015-16	4733.45	532358.2	0.88%
2016-17	**5131.26**	**539571.3**	**0.95%**
2017-18	7852.26	570041.6	1.38%
2018-19	7398	601176	1.23%
2019-20	7372.41	678522.8	1.08%
2020-2021	11799.4	708180.2	1.67%
Average	5751.111	520351.908	1.05%
S.D.	2844.462752	127620.373	0.002898582
C.V.%	49.45	24.52	27.555

Source: Annual Reports And Accounts Of Canara Bank For The Period Under Study

The bank's Non-Int. Income to Long-Term Fund Ratio has been consistently increasing from 2011–12 to 2020–21, which shows that its performance in making money from non-core business has improved. Over the ten years, the proportion more than doubled from 0.81% in 2011–12 to 1.67% in 2020–21. This indicates a deliberate move toward increasing non-Int. Income streams like fee-based ones. Key spikes in 2017–18 (1.38%), 2018–19 (1.23%), and 2020–21 (1.67%) show particular years when non–Int. Income grew significantly, most likely as a result of either diversification in services, favorable market conditions, or policy changes boosting non–fund-based income.

With a coefficient of variation (C.V.) of 27.56%, the mean ratio across the ten years is 1.05%, showing moderate variation in the ratio throughout time. Non-Int. Income has a high C.V. of 49.45%, which shows that it changes a lot, while Long-Term Funds are

quite stable (C.V. of 24.52%). This suggests that variations in non-interest revenue—rather than the fund base—primarily determine the volatility in the ratio. generally speaking, the data show that non-Int. Income generation is improving significantly, but the great variation indicates that this income stream could still be susceptible to market and operational elements and would benefit from stability and consistency.

Table 4.116

- **T-Test Paired Two Sample For Means**

(Canara Bank) Ratio 5 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.00842	0.01262
Variance	8.2E-08	0.000007797
Observations	5	5
Pearson Correlation	0.709107968	
Hypothesized Mean Difference	0	
df	4	
t Stat	-3.61612401	
P(T<=t) one-tail	0.011217119	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.022434239	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

To compare Canara Bank's Ratio 5 across two scenarios, a paired t-test was carried out. Variable 2 (0.01262) has a higher mean than Variable 1 (0.00842). With a t-statistic of -3.616 and a one-tailed p-value of 0.0112—which is less than the critical value of 0.05—there is a statically significant difference at the 5% level. The two-tailed p-value is 0.0224, which is less than 0.05, which means the result is significant. Variable 2 seems to be much higher than Variable 1, and chance does not explain the rise in the ratio.

7) **Indian Bank**

To find the ratio of non-Int. Income to Long Term Fund of Indian Bank, the calculation method is the rate of Non-Int. Income of individual year divided by Long Term Fund of Indian Bank. The ratio has been shown in the table below:

Table 4.117

Ratio Of NII To Long Term Fund Of Indian Bank

(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Long Term Fund	Ratio(%)
2011-12	1188.06	117519.4	1.01%
2012-13	1194.71	136513.2	0.87%
2013-14	1293.4	156937.7	0.82%
2014-15	1378.03	181257.4	0.76%
2015-16	1372.21	186895.5	0.73%
2016-17	**1788.94**	**198275.3**	**0.90%**
2017-18	2222.4	212569.9	1.04%
2018-19	2416.59	246757.3	0.97%
2019-20	1891.43	273914.3	0.69%
2020-2021	3325.5	303803.5	1.09%
Average	1807.127	201444.334	0.89%
S.D.	687.3687461	59419.26231	0.001379
C.V.%	38.03	29.49	15.52

Source: Annual Reports And Accounts Of Indian Bank For The Period Under Study

The Non-Int. Income to Long-Term Fund Ratio for the bank from 2011-12 to 2020-21 shows an overall oscillating pattern with a slight upward trend in more recent years. Originally starting at 1.01% in 2011–12, the ratio fell marginally throughout the middle years to a low of 0.69% in 2019–20 before rising again to 1.09% in 2020–21.

With an average ratio of 0.89% over the ten-year period, non-Int. Income shows a fairly consistent contribution compared to long-term resources. This trend is a result of the bank's slow and deliberate focus on growing its revenue from things other than its main business, especially in more recent years, which may be because it is now more focused on things like service charges, commissions, and digital banking activities.

In terms of variability, the coefficient of variation (C.V.) for the ratio is 15.52%, suggesting relatively low fluctuation and consistent performance in maintaining non-Int. Income levels in proportion to its long-term funds. With a C.V. of 29.49% for the Long-Term Fund base being more stable, the Non-Int. Income shows a higher C.V. of 38.03%, suggesting more year-on-year volatility. This suggests that the ratio's variations are mostly caused by variations in non-Int. Income even if the fund base has expanded consistently. The data points to a rather balanced and growing reliance on non-Int. Income overall, with room to further stabilize and improve this stream for long-term financial resiliency.

Table 4.118

- **T-Test Paired Two Sample For Means**

(Indian Bank) Ratio 5 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.00838	0.00938
Variance	0.000001217	2.44E-06
Observations	5	5
Pearson Correlation	-0.013355335	
Hypothesized Mean Difference	0	
df	4	
t Stat	-1.162476387	
P(T<=t) one-tail	0.154835498	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.309670996	

t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

Ratio 5 of Indian Bank underwent a paired t-test. Variable 2's mean (0.00938) somewhat surpasses Variable 1's (0.00838). The t-statistic is -1.162, though; its one-tailed p-value of 0.1548 is more than the critical value (0.05). Also over 0.05, the two-tailed p-value is 0.3097. These data imply that the two variables are not statically different, hence Ratio 5 has no noteworthy variation between the two settings.

8) Indian Overseas Bank

To find the ratio of non-Int. Income to Long Term Fund of Indian Overseas Bank, the calculation method is the rate of Non-Int. Income of individual year divided by Long Term Fund of Indian Overseas Bank. The ratio has been shown in the table below:

Table 4.119

Ratio Of NII To Long Term Fund Of Indian Overseas Bank

(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Long Term Fund	Ratio(%)
2011-12	1225.1	173909.1	0.70%
2012-13	1681.04	213975.7	0.78%
2013-14	1972.91	238915.6	0.82%
2014-15	2209.52	268602.3	0.82%
2015-16	2138.6	279922.2	0.76%
2016-17	**2528.26**	**267363.4**	**0.94%**
2017-18	3372.64	241184.9	1.40%
2018-19	3746.44	239333.9	1.56%
2019-20	4206.32	245040	1.71%

2020-2021	3306.37	244526.6	1.35%
Average	2638.72	241277.34	1.08%
S.D.	970.3446098	30255.3856	0.003791863
C.V.%	36.77	12.53	34.98

Source: Annual Reports And Accounts Of IOB For The Period Under Study

The Non-Int. Income to Long-Term Fund Ratio from 2011-12 to 2020-21 shows a clear upward trend, which points to the bank's growing reliance on income sources other than fund-based ones. The ratio rose from 0.70% in 2011–12 to a high of 1.71% in 2019–20, for an average of 1.08% throughout the decade. The bank's deliberate attempts to vary income streams by increasing non-interest revenue including fees, commissions, and service charges are reflected in this expansion. The steep climb between 2016–17 and 2019–20 points to a time of rapid development, most likely brought on by policies encouraging non-core revenue, more financial services, or digital transformation.

From a variability point of view, the coefficient of variation (C.V.) for the ratio is 34.98%, which shows that non-Int. Income varies a lot compared to long-term funds. Conversely, with a low C.V. of 12.53% indicating consistent and stable growth, the long-term fund base has a low C.V. The higher C.V. of non-Int. Income (36.77%) implies that variations in the ratio mostly result from variations in non-Int. Income values rather than from fund base changes. This suggests that, despite notable strides in increasing non-Int. Income, keeping a steady performance in this field presents a difficulty and calls for more stabilization and strategic honing.

Table 4.120

- **T-Test Paired Two Sample For Means**

(Indian Ove. Bank) Ratio 5 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**

Mean	0.00776	0.01392
Variance	0.000000248	0.000008387
Observations	5	5
Pearson Correlation	0.978358115	
Hypothesized Mean Difference	0	
df	4	
t Stat	-5.71301748	
P(T<=t) one-tail	0.002321547	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.004643094	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

Ratio 5 of Indian Overseas Bank underwent a paired t-test. Variable 1's mean (0.00776) is notably less than Variable 2's (0.01392). The t-statistic is -5.713, and the one-tailed p-value is 0.0023, which is significantly below the 0.05 threshold and points to a very significant difference. The two-tailed p-value of 0.0046 also supports statistical significance. The test obviously shows that Variable 2 is considerably higher, indicating a major improvement or shift in Ratio 5 over time or across settings as the paired values have a strong positive correlation (0.978).

9) PNB

To find the ratio of non-Int. Income to Long Term Fund of PNB, the calculation method is the rate of Non-Int. Income of individual year divided by Long Term Fund of PNB. The ratio has been shown in the table below:

Table 4.121

Ratio Of NII To Long Term Fund Of PNB
(From 2011-12 To 2020-21) (Rs in crores)

IMPACT OF DEMONETIZATION ON NON FUND BASE INCOME OF PUBLIC SECTOR BANKS IN INDIA

Years	Non Int Income	Long Term Fund	Ratio(%)
2011-12	3655.36	373786.4	0.98%
2012-13	4239.51	456588.9	0.93%
2013-14	4302.03	480925.5	0.89%
2014-15	4710.34	480753.2	0.97%
2015-16	6174.6	617038.6	1.00%
2016-17	**6976**	**694589.3**	**1.00%**
2017-18	9167.58	716932.4	1.27%
2018-19	8888.35	757053.2	1.17%
2019-20	7367.39	774220.3	0.95%
2020-2021	9387.66	837003.8	1.12%
Average	6486.88	618889.14	1.03%
S.D.	2197.919006	160093.6421	0.001197961
C.V.%	33.88	25.86	11.65

Source: Annual Reports And Accounts Of PNB For The Period Under Study

The Non-Int. Income to Long-Term Fund Ratio of the bank for the years 2011-12 to 2020-21 tends to be upward overall. Early years saw the ratio hovering around 1%, then progressively rising to a peak of 1.27% in 2017–18, with an average of 1.03% throughout the decade. This suggests a fairly consistent and good contribution from non-interest revenue to the overall long-term cash for the bank. The rise in non-Int. Income, especially from 2015–16 onwards, points to a greater emphasis on non-core banking income including fees, commissions, and service-based charges. Remarkably, the bank kept this ratio above or near 1% for several years, which shows that its revenue streams were consistently varied.

From a variability point of view, the coefficient of variation (C.V.) for the ratio is just 11.65%, which shows a quite low level of variation and implies a strong level of stability in the link between non-interest revenue and long-term funds. Non-Int. Income's higher C.V. of 33.88% and long-term funds' C.V. of 25.86% imply that both factors have risen equAll y, as evidenced by the limited variation in the ratio. This shows that the bank's financial management is good, since it shows that its non-Int. Income strategies have been in line with the growth of its long-term fund base.

Table 4.122

- **T-Test Paired Two Sample For Means**

(PNB) Ratio 5 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.00954	0.01102
Variance	0.000000193	1.667E-06
Observations	5	5
Pearson Correlation	-0.557109582	
Hypothesized Mean Difference	0	
df	4	
t Stat	-2.096392989	
P(T<=t) one-tail	0.052038146	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.104076293	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

For Ratio 5 of Punjab Bank, a paired t-test was run. Variable 1's mean (0.00954) is somewhat lower than Variable 2's (0.01102). With a one-tailed p-value of 0.052,

which is somewhat above the 0.05 significance level, the t-statistic is -2.096 and so the finding is not statically significant at the 5% level. Likewise, the two-tailed p-value of 0.104 supports the absence of relevance. In one-tailed terms, the difference in the ratios is almost significant; yet, it is not strong enough to draw a useful conclusion about a meaningful change.

10) Union Bank Of India

To find the ratio of non-Int. Income to Long Term Fund of Union Bank Of India, the calculation method is the rate of Non-Int. Income of individual year divided by Long Term Fund of Union Bank Of India . The ratio has been shown in the table below:

Table 4.123

Ratio Of NII To Long Term Fund Of Union Bank Of India

(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Long Term Fund	Ratio(%)
2011-12	2039.72	228701.1	0.89%
2012-13	2316.31	255505.2	0.90%
2013-14	2868.04	304938.4	0.94%
2014-15	3140.73	345731.8	0.90%
2015-16	3957.12	372526.3	1.06%
2016-17	**3934.43**	**397802.2**	**0.98%**
2017-18	5429.98	445024.8	1.22%
2018-19	5462.08	481220.6	1.14%
2019-20	5041.71	487616.1	1.03%
2020-2021	5789.27	539139.6	1.07%
Average	3997.939	385820.6	1.01%

S.D.	1381.321883	103608.9446	0.0011146
C.V.%	34.55	26.85	11

Source: Annual Reports And Accounts Of UBI For The Period Under Study

The bank's information from 2011-12 to 2020-21 demonstrates a consistent rise in the Non-Int. Income to Long-Term Fund Ratio, which increased from 0. 89% in 2011-12 to 1. 07% in 2020-21. The highest point of the ratio was 1. 22% in 2017-18, highlighting significant growth in non-fund-based income areas like fees, commissions, and other service-related gains. The average ratio of 1. 01% throughout the decade shows that non-Int. Income reliably accounted for a significant part compared to long-term funds. This trend indicates the bank's achievement in broadening its income sources beyond just interest-based means, particularly during the latter years of the decade.

Regarding variability, the coefficient of variation (C. V.) for the ratio stands at 11%, indicating minimal fluctuation and stable performance over the years. In contrast, Non-Int. Income and Long-Term Funds exhibit higher C. V. s of 34. 55% and 26. 85% respectively; however, the low variation in the ratio suggests that both elements expanded together. This stability reflects favorably on the bank's financial management and its approach to sustaining a steady connection between income generation and long-term funding. The overall results illustrate successful revenue diversification and steady financial growth, enhancing the bank's resilience to changes in interest rates.

Table 4.124

- **T-Test Paired Two Sample For Means**

(Union Bank) Ratio 5 T-Test: Paired Two Sample For Means

	Variable 1	Variable 2
Mean	0.00938	0.01088
Variance	0.000000502	8.87E-07
Observations	5	5
Pearson Correlation	0.010490215	
Hypothesized Mean Difference	0	
df	4	
t Stat	-2.860387768	
P(T<=t) one-tail	0.022955756	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.045911512	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

A paired t-test was performed on Ratio 5 from Union Bank. The average for Variable 1 (0. 00938) is less than that of Variable 2 (0. 01088). The t-statistic stands at -2. 86, with a one-tailed p-value of 0. 0229, which fall s beneath 0. 05, signifying a meaningful difference in the one-tailed analysis. The two-tailed p-value is 0. 0459, which is also under the 0. 05 limit, affirming the significance. This indicates that Variable 2 is considerably greater, and the enhancement in Ratio 5 is not a result of random fluctuation.

11) UCO Bank

To find the ratio of non-Int. Income to Long Term Fund of UCO Bank , the calculation method is the rate of Non-Int. Income of individual year divided by Long Term Fund of UCO Bank. The ratio has been shown in the table below:

Table 4.125

Ratio Of NII To Long Term Fund Of UCO Bank

(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Long Term Fund	Ratio(%)
2011-12	925.41	158171.6	0.58%
2012-13	965.55	175518.4	0.55%
2013-14	952.17	192905.9	0.49%
2014-15	1320.51	231478.1	0.57%
2015-16	2003.55	237138.2	0.84%
2016-17	**1596.31**	**236880.6**	**0.67%**
2017-18	2114.49	223573	0.94%
2018-19	1121	209255.7	0.53%
2019-20	1513.51	223621.5	0.67%
2020-2021	2871.21	228108.1	1.25%
Average	1538.37	211665.10	0.71%
S.D.	632.269111	27402.8335	0.00237461
C.V.%	41.09	12.94	33.49

Source: Annual Reports And Accounts Of UCO Bank For The Period Under Study

The figures from 2011-12 to 2020-21 illustrate a steady increase in the ratio of Non-Int. Income to Long-Term Funds, demonstrating that the bank has made progress in generating income from activities outside its core operations. Beginning at 0. 58% in 2011-12, the ratio experienced a minor decline during the middle years but surged to 1. 25% by 2020-21. The decade's average stands at 0. 71%, indicating a slight yet steady addition of non-Int. Income to the bank's financial framework. Importantly, the marked rise in 2015-16 and once more in 2020-21 highlights the bank's specific

initiatives to enhance revenues from services like fees, commissions, and other non-fund-based streams.

Regarding variability, the coefficient of variation (C. V.) for this ratio is 33. 49%, reflecting a moderate to significant fluctuation in performance throughout the years. This variation is mainly attributed to changes in Non-Int. Income, which has a higher C. V. of 41. 09%, while Long-Term Funds have remained fairly stable with a C. V. of 12. 94%. The greater volatility in non-Int. Income indicates irregularity in its generation, likely due to external economic influences, shifts in policies, or differing institutional approaches. overall, even though the trend in the Ratio (%) is encouraging, the bank ought to concentrate on stabilizing and enhancing its non-Int. Income avenues to secure ongoing growth and financial stability.

Table 4.126

- **T-Test Paired Two Sample For Means**

(Uco Bank) Ratio 5 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.00606	0.00812
Variance	0.000001833	8.202E-06
Observations	5	5
Pearson Correlation	0.882291224	
Hypothesized Mean Difference	0	
df	4	
t Stat	-2.577821035	
P(T<=t) one-tail	0.030734343	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.061468686	
t Critical two-tail	2.776445105	

Data Is Calculated By Researcher

Decision :

A paired t-test was conducted for Ratio 5 of UCO Bank. The average of Variable 1 (0. 00606) is less than that of Variable 2 (0. 00812). The t-statistic calculated is -2. 578, and the one-tailed p-value obtained is 0. 0307, which fall s below the critical threshold of 0. 05. This indicates a meaningful difference at the 5% level for a one-tailed test. Conversely, the two-tailed p-value stands at 0. 0615, which is just above 0. 05, suggesting that the difference is not significant in a two-tailed scenario. In summary, the findings imply that Variable 2 is notably greater than Variable 1 in the one-tailed assessment, indicating an enhancement in Ratio 5.

12) P&S Bank

To find the ratio of non-Int. Income to Long Term Fund of P&S Bank , the calculation method is the rate of Non-Int. Income of individual year divided by Long Term Fund of Punjab & Sind Bank. The ratio has been shown in the table below:

Table 4.127
Ratio Of NII To Long Term Fund Of P&S Bank
(From 2011-12 To 2020-21) (Rs in crores)

Years	Non Int Income	Long Term Fund	Ratio(%)
2011-12	437.08	66412.46	0.65%
2012-13	417.46	70755.26	0.59%
2013-14	417.15	77785.65	0.53%
2014-15	427.28	92046.49	0.46%
2015-16	428.75	95046.49	0.45%
2016-17	**478.48**	**100059.2**	**0.47%**
2017-18	578.1	94641.07	0.61%

2018-19	581.2	111591.8	0.52%
2019-20	828.28	106973	0.77%
2020-2021	897.39	98477	0.91%
Average	549.11	91378.846	0.60%
S.D.	177.2376294	15038.62502	0.00148264
C.V.%	32.27	16.45	24.87

Source: Annual Reports And Accounts Of P & S Bank For The Period Under Study

The data emphasizes the pattern and variance in the bank's non-Int. Income in relation to its long-term funds over the years 2011–12 to 2020–21. usually staying under 1%, the ratio of non-Int. Income to long-term funds shows that non-Int. Income accounted for a tiny part of the bank's total financial foundation. Although the ratio changed over time, up to 2015–16 it showed a steady fall , reaching a low of 0.45%. Then, in 2020–21, it rose dramatically to 0.91%. This increasing trend in recent years indicates that the bank has begun to emphasize diversifying its income sources beyond conventional interest-based means.

The statistical numbers support these findings even more. With a high coefficient of variation (C.V.) of 32.27%, the average non-Int. Income stood at ₹549.11 crore, indicating substantial swings in non-Int. Income over the years. In contrast, the long-term funds displayed more stability with a lower C.V. of 16.45%. The ratio's C.V. of 24.87% also reflects moderate variability, suggesting that while non-Int. Income did not constantly grow with long-term funds, it became relatively more prominent toward the end of the period. This points to better attempts to boost ancillary revenue sources, therefore supporting the bank's financial stability.

Table 4.128

- **T-Test Paired Two Sample For Means**

(P& S Bank) Ratio 5 T-Test: Paired Two Sample For Means		
	Variable 1	**Variable 2**
Mean	0.00536	0.00656
Variance	7.28E-07	3.318E-06
Observations	5	5
Pearson Correlation	-0.85864708	
Hypothesized Mean Difference	0	
Df	4	
t Stat	-1.03548364	
P(T<=t) one-tail	0.17946795	
t Critical one-tail	2.13184679	
P(T<=t) two-tail	0.35893591	
t Critical two-tail	2.77644511	

Data Is Calculated By Researcher

Decision :

To examine Ratio 5 for Punjab & Sind Bank between two time periods, a paired sample t-test was carried out. Variable 1 had a mean value of 0.00536, while Variable 2 had one of 0.00656, respectively. Although the methods seem to be different, the computed t-statistic (-1.0355) is lower than the critical t-value (±2.7764 for two-tailed, 2.1318 for one-tailed), and the p-values (0.1795 one-tail, 0.3589 two-tail) are both above 0.05.The two sets of ratio mean show no statically significant difference at the 5% significance level. The measured variance may be caused by random fluctuations rather than a real shift in the base performance.

Table 4.129

Ratio of Non-Int. Income to Long Term Fund of All PSBs under Study

(From 2011-12 to 2020-21)

(Ratio in Percentage)

Years	BOB	SBI	BOI	BOM	CBOI	Canara Bank	Indian Ov.Bank	PNB	Indian Bank	UBOI	Uco Bank	P& S Bank
2011-12	0.92%	2.30%	0.78%	0.72%	0.60%	0.81%	0.70%	0.98%	1.01%	0.89%	0.58%	0.65%

2012-13	0.92%	1.77%	0.89%	0.07%	0.63%	0.84%	0.78%	0.93%	0.87%	0.90%	0.55%	0.59%
2013-14	0.83%	1.66%	0.85%	0.81%	0.64%	0.82%	0.82%	0.89%	0.82%	0.94%	0.49%	0.53%
2014-15	0.84%	1.71%	0.77%	0.68%	0.69%	0.86%	0.82%	0.97%	0.76%	0.90%	0.57%	0.46%
2015-16	0.77%	2.00%	0.70%	0.72%	0.63%	0.88%	0.76%	1.00%	0.73%	1.06%	0.84%	0.45%
2016-17	**0.90%**	**1.95%**	**0.61%**	**0.66%**	**0.65%**	**0.95%**	**0.94%**	**1.00%**	**0.90%**	**0.98%**	**0.67%**	**0.47%**
2017-18	1.14%	2.16%	1.11%	0.98%	0.88%	1.38%	1.40%	1.27%	1.04%	1.22%	0.94%	0.61%
2018-19	1.11%	2.27%	0.96%	1.00%	0.81%	1.23%	1.56%	1.17%	0.97%	1.14%	0.53%	0.52%
2019-20	0.99%	2.14%	0.85%	1.00%	0.74%	1.08%	1.71%	0.95%	0.69%	1.03%	0.67%	0.77%
2020-2021	1.06%	2.38%	1.06%	1.00%	1.06%	1.67%	1.35%	1.12%	1.09%	1.07%	1.25%	0.91%

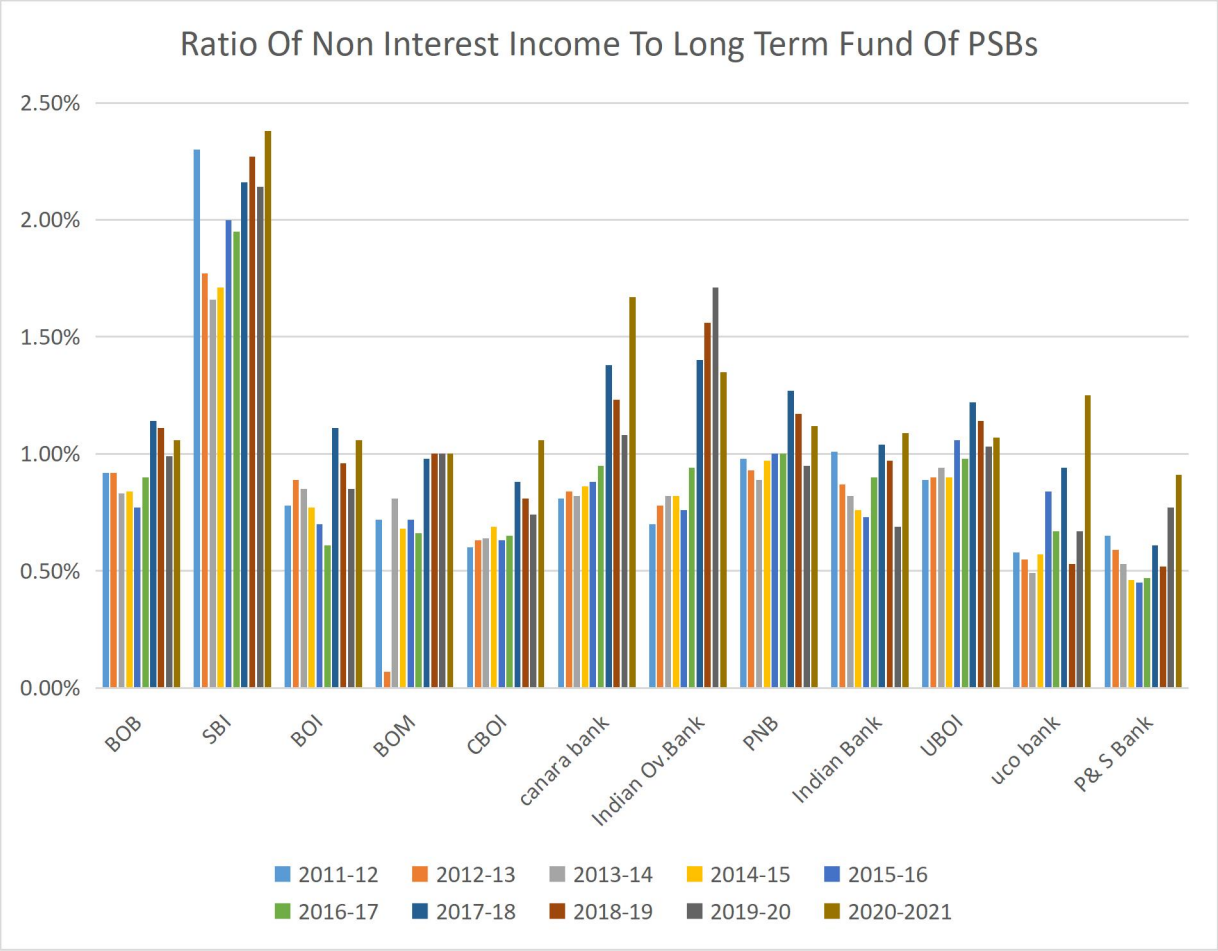
Source: Annual Reports And Accounts Of All PSBs For The Period Under Study

Chart 4.5

Ratio of Non-Int. Income to Long Term Fund of All PSBsunder Study

(From 2011-12 to 2020-21)

(Ratio in Percentage)



The bar chart shows the pattern of a particular financial ratio (probably non-Int. Income to total income or a similar metric) across 12 PSBs from financial years 2011–12 to 2020–21. A clear change in ratio levels is seen across both time and banks. Notably, SBI and BOI (BOI) regularly have the highest ratio values, ranging from around 2% to 2.5% between 2016–17 and 2020–21, which points to a greater dependency or performance in the measured area than others.

By contrast, banks such Central Bank Of India (CBOI), Canara Bank, and P&S Bank usually have lower ratios, most of them under 1%, pointing to greater restricted performance or reliance in this field. Most banks show a consistent rise in the post-2016–17 ratio over time, especially in 2020–21, implying a move toward increasing other sources of income, possibly as a strategic response to interest rate changes or regulatory adjustments. The general pattern shows different tactics and effectiveness among banks in diversifying income or boosting performance in the affected region.

- **<u>Two Way Anova Test Is Applied For PSBs Under Study (F Test)</u>**

Two-way F-test has been applied to study impact of demonetization on PSBs with the following hypothesis :

1) **Null Hypothesis (Ho):** Under this study, there is no significant difference in the non-Int. Income to Long Term Fund ratio between the banks.

2) **Null Hypothesis (Ho):** Under this study, there is no significant year-wise difference in the non-Int. Income to Long Term Fund ratio within the banks.

Table 4.130

ANOVA TABLE

Source	Sum	Degree Of Freedom (d.f.)	Variance (Sum/d.f.)	F Ratio
Between Banks(SSC)	0.001483	(c-1) = (12-1) =11	0.000135	5.86
Within Banks (SSR)	0.000270	(r-1) = (10-1) = 9	0.00003	13.04
Error (SSE)	0.000232	(c-1) (r-1) = 99	0.000023	

Data is calculated by the researcher

1) **F Test Between the Banks**

V1 = 11, V2 = 99

Table value of F at 5 % level of significance = 1.89

$F = \frac{\text{Higher Variance}}{\text{Smaller Variance}}$ $F = \frac{0.000135}{0.000023} = 5.86$

Whether there is a significant difference in the volatility of a specific financial ratio among several banks is found using the F-test carried out between the banks. Here, the computed F value of 5.86 exceeds the critical F value of 1.89 at the 5% significance level with degrees of freedom V1 = 11 and V2 = 99.

We reject the null hypothesis because the computed F is beyond the critical value. This suggests that the variations of the ratio among the banks differ considerably in a statistical manner. That is to say, the performance variance (as reflected by the ratio) is not consistent among the banks; some have far greater or lower swings than others.

Among the banks, variations in operational efficiency, risk profiles, management approaches, or business models may account for this.

2) **F Test Within the Banks**

V1 = 9, V2 = 99

Table value of F at 5 % level of significance = 1.98

$$F = \frac{\text{Higher Variance}}{\text{Smaller Variance}} \qquad F = \frac{0.0003}{0.000023} = 13.04$$

The F-test done inside the banks judges if there is a notable variation in the year-wise variance of a financial ratio across time for individual banks. In this instance, the computed F value of 13.04 is considerably greater than the critical value of 1.98 at the 5% level of significance (with degrees of freedom V1 = 9 and V2 = 99).

We reject the null hypothesis since the calculated F value exceeds the table value. This means that the variances inside the banks have changed considerably statically throughout the years. Financial ratios, in other words, have not stayed steady throughout; rather, they have seen great swings inside of particular institutions. Changes in policy, economic circumstances, strategic choices, or operational errors over time could explain these differences.