EFFICIENCY OF PUBLIC, PRIVATE AND FOREIGN BANKS IN INDIA

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Abstract

Public, Private and Foreign sector banks need to work in synchronisation to achieve financial well-being of an economy. Their presence is one of the key drivers to increase competition and promote efficiency of the banking system in the country. Here an attempt has been made to study efficiency of Public, Private and foreign banks operating in India. .Data from year 2001 to 2016 related to efficiency indicators have been used to calculate various statistical values. Kolmogorov-Smirnov and Shapiro-Wilk Tests are used to check for normality of distribution. Levene's Test is used to check the homogeneity of variance and mean has been used as the basis for comparison of variance. To test the hypothesis of the dependent samples, Kruskal-Wallis Test has been used.

Keywords: Productivity, Efficiency, Credit Deposit Ratio, Return on Equity, Return on Assets.

INTRODUCTION

Financial well being of an economy depends upon good performance of banking industry in the country. Public, private and foreign sector banks need to work in harmony to achieve financial well-being of an economy. Public sector banks perform many of social and economic obligations .Private sector banks brings new technology,innovation , operational and managerial efficiencies .Foreign banks help in bringing new technology, channelizing foreign investments and efficiencies in the market. Presence of all the three sectors i.e. public, private, and foreign in the banking sector promotes competition and efficiency in the banking system. Here an attempt has been made to do a comparative study on the productivity of public, private and foreign sector banks operating in India.

REVIEW OF LITERATURE

The first attempt to study productivity, efficiency, and profitability of commercial banks was made by the Luther Committee which was appointed by the Reserve Bank of India , submitted its report in 1976. The committee recommended improving capital base of banks and the interest on additional cash reserves in excess of statutory minimum should be related to cost of funds for banks.

Verghese (1983) attributed fluctuations in profits and profitability of commercial banks mainly to "changes in interest rates, reserve requirements and interest tax". **Indian Bankers' Association (1997)** a nation-wide survey on the

27 public sector banks' customer service conducted on 3 January 1997 by IBA provided useful findings. "The Western region of our economy showed excellent results with 26 banks given "A" rating (above 75 per cent quality and satisfaction) service followed by southern and northern region with 22 and 21 banks in the "A" category respectively. In terms of quality standards and customer satisfaction, the central region was lagging far behind with only one bank in the "A" group and majority in "B" category (60-75 per cent satisfaction)". **Gupta (1997)** has also concluded that" NPAs affect the profitability of banks and leads to liquidity crunch and slowdown in growth in GDP". **Haque (2014)** in his study evaluated the concurrent performance of chosen few major Indian banks during 2009-2013 following the global financial slump of 2008. He used the parameters— return on asset, return on equity and net interest margin. "Conclusion of the study indicates that there is no significant means in difference of profitability among various banking groups in respect to ROA and NIM, yet a significant means of difference is seen among the peer groups in terms of ROE". **Singh (2016)** in his study of non-performing assets of Indian scheduled commercial banks considered non-performing assets in scheduled commercial banks.It was concluded that the NPAs affect the liquidity and profitability. Generally the findings included rise in the overall efficiency and profitability of all categories of banks after reforms .In some studies foreign banks showed highest efficiency followed by private sector banks whereas in some studies private sector banks showed greater efficiency.

OBJECTIVES OF STUDY

i)   To Study Productivity of Public, Private and Foreign Banks in India.

ii)   To make comparative analysis of productivity of public, private and foreign banks during the study period and give suggestions for improving the Productivity of banks.

HYPOTHESIS OF THE STUDY:

i)   There is no significant difference in the productivity of public, private, and foreign banks during the study period.

RESEARCH METHODOLOGY

Data from year 2001 to 2016 related to productivity indicators like business per employee, profit per employee, business per branch, operating expenses per

branch, profit per branch of selected banks have been used to calculate various statistical values like mean, median, Standard deviation and coefficient of variation.. Kolmogorov-Smirnov and Shapiro-Wilk Tests are used to check for normality of distribution. Levene's Test is used to check the homogeneity of variance and mean has been used as the basis for comparison of variance. To test the hypothesis of the dependent samples, Kruskal-Wallis Test has been used.

PRODUCTIVITY INDICATORS

To study productivity of public, private and foreign sector banks in depth analysis of indicators like business per employee, profit per employee, business per branch, operating expenses per branch and profit per branch have been done.

Business per Employee: Mean business per employee for public, private, and foreign sector banks are presented graphically in figure 1.1. Mean business per employee is highest for foreign banks followed by public sector banks and private sector banks. Results of descriptive statistics for business per employee of public, private and foreign sector banks are presented in table 1.1. Mean business per employee is highest for foreign sector banks followed by public sector banks. Again median business per employee is highest for foreign sector banks followed by public sector banks. Absolute variation is lowest for private sector banks followed by public sector banks .On the basis of relative measure of risk; coefficient of variation is lowest for private sector banks and public sector banks. It can be concluded that foreign banks performed best in terms of business per employee followed by public sector banks whereas private sector banks stood last. Variation has been lowest for private sector banks indicating consistency in their performance whereas variation is highest for foreign sector banks revealing fluctuation in their performance.

Table-1.1: Business per Employee of Public, Private and Foreign Sector Banks.

(Rs. in lakhs)

Type of Bank	Arithmetic Mean	Median	Standard Deviation (S.D.)	Coefficient of Variation (coefficient of variation.)
Public	609.96	595.72	127.82	0.21
Private	490.94	521.85	61.96	0.13
Foreign	1570.74	1540.73	665.87	0.42

Source: Data has been compiled from various issues of Trend and Progress of banking in India (Published by RBI)
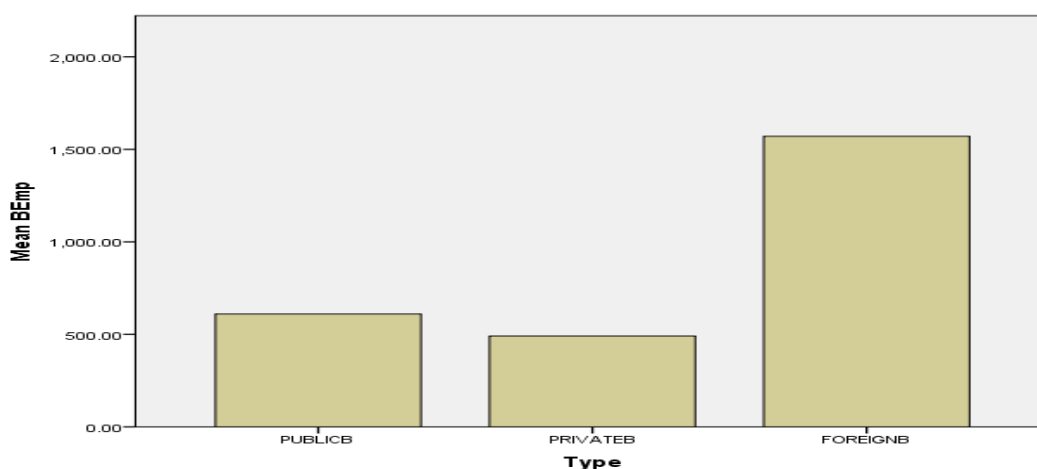
Figure-1.1: Mean Business per Employee

Profit per Employee: Mean Profit per employee for Public, private, and foreign sector banks are presented graphically in figure 1.2. Mean profit per employee is highest for foreign banks and lowest for private sector banks. Results of descriptive statistics for profit per employee of public, private and foreign sector banks are presented in table 1.2 Mean Profit per employee is highest for foreign sector banks followed by public sector banks. Similarly median profit per employee is again highest for foreign sector banks followed by public sector banks. Absolute variation is lowest for public sector banks and private sector banks. On the basis of relative measure of risk, coefficient of variation is lowest for public sector banks followed by private sector banks. Conclusion can be drawn that foreign banks performed very well and have been much ahead of public and private sector banks in terms of profit per employee. Coefficient of variation has been lowest for public sector banks indicating consistency whereas it has been highest for private sector banks.

Table-1.2: Profit per Employee. (Rs. in lakhs)

Type of Bank	Arithmetic Mean	Median	Standard Deviation (S.D.)	Coefficient of Variation (coefficient of variation.)
Public	3.94	3.93	1.16	0.29
Private	3.66	3.88	1.79	0.49
Foreign	26.82	20.86	21.43	0.80

Source: Data has been compiled from various issues of Trend and Progress of banking in India (Published by RBI)
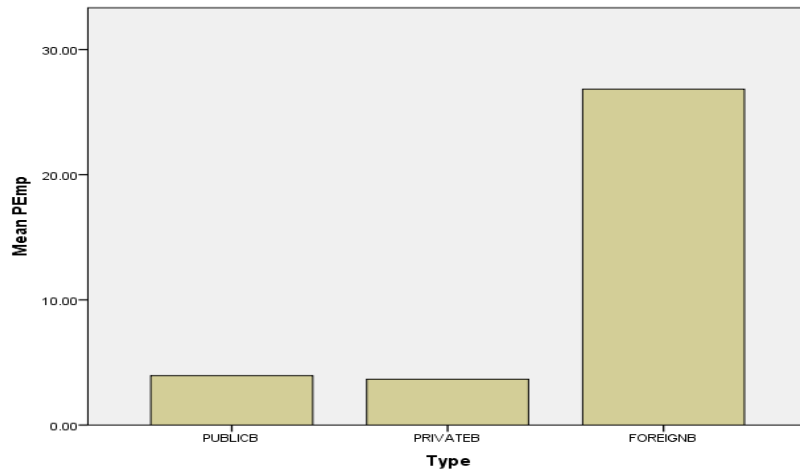
Figure-1.2: Mean Profit per Employee

Business per Branch: Mean business per branch for public, private, and foreign sector banks are presented graphically in figure 1.3. Mean business per branch stood highest for public sector banks followed by private sector banks and foreign Banks. Results of descriptive statistics for business per branch of public, private and foreign sector banks are presented in table 1.3. Mean business per branch is highest for public sector banks followed by private sector banks. Median business per branch is highest for public sector banks followed by private sector banks. Absolute variation is lowest for foreign Sector banks and public sector banks .On the basis of relative measure of risk coefficient of variation lowest is for public sector banks followed by foreign sector banks. Conclusion can be arrived at that performance of public sector banks has been excellent, private sector banks performed good whereas foreign banks performed poorly in terms of business per branch. Coefficient of variation indicates consistent performance in public sector banks whereas private and foreign sector banks have shown high variation in business per branch.

Table-1.3: Business per Branch.   **(Rs. in lakhs)**

Type of Bank	Arithmetic Mean	Median	Standard Deviation (S.D.)	Coefficient of Variation (coefficient of variation.)
Public	7700.31	7787.56	1732.55	0.22
Private	4578.30	4653.56	3449.67	0.75
Foreign	1176.08	1041.16	733.26	0.62

Source: Data has been compiled from various issues of Trend and Progress of banking in India (Published by RBI)
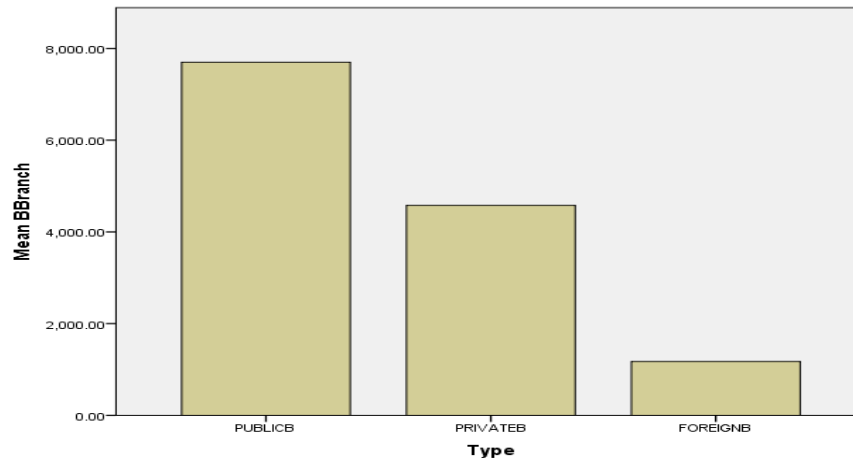
Figure-1.3: Mean Business per Branch

Operating Expenses per Branch: Mean operating expenses per branch for public, private, and foreign sector banks are presented graphically in figure 1.4. Mean operating expenses per branch stood lowest for private sector banks and highest for foreign sector banks. Results of descriptive statistics for operating expenses of public, private and foreign sector banks are presented in table 1.4. Mean operating expenses per branch is lowest for private sector banks and highest for foreign sector banks. Median operating expenses per branch is again lowest for private sector banks and highest for foreign sector banks. Absolute variation is lowest for private sector banks and public sector banks. On the basis of relative measure of risk coefficient of variation lowest is for public sector banks followed by private sector banks. It can be concluded that private sector banks performed very well and managed to keep operating expenses at minimum level, public sector banks also performed good whereas foreign sector banks performed very poorly, as their operating expenses per branch have been very high .Low coefficient of variation shown by private and public sector banks reveals consistence in their performance whereas variation stood very high for foreign sector banks.

Table-1.4: Operating Expenses per Branch. (Rs. in lakhs)

Type of Bank	Arithmetic Mean	Median	Standard Deviation (S.D.)	Coefficient of Variation (coefficient of variation.)
Public	92.79	85.16	30.19	.33
Private	73.35	68.93	22.64	.308
Foreign	2478.36	1872.35	2069.43	.834

Source: Data has been compiled from various issues of Trend and Progress of banking in India (Published by RBI)
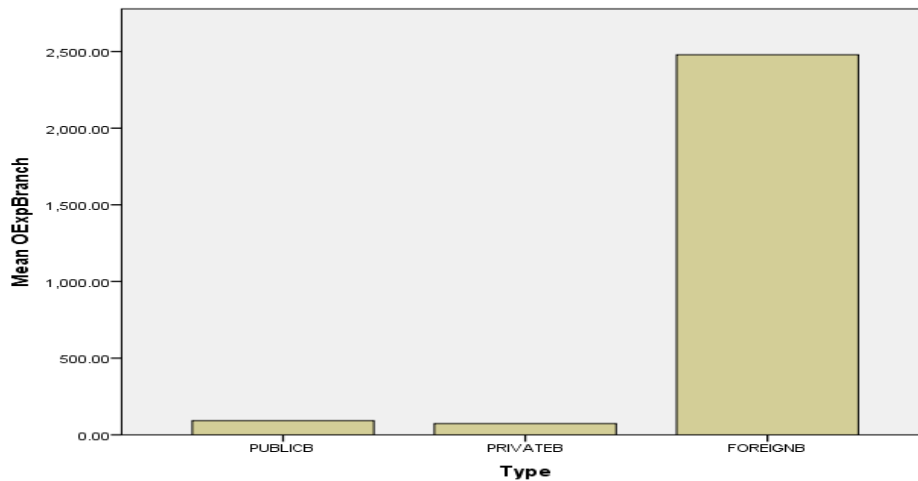

Figure-1.4: Mean Operating Expenses per Branch

Profit per Branch: Mean profit per branch for public, private, and foreign sector banks are presented graphically in figure 1.5. Foreign Banks show highest mean profit per branch followed by public sector banks and private sector banks. Results of descriptive statistics for profit per branch of public, private and foreign sector banks are presented in table 1.5. Mean profit per branch is highest for foreign sector banks followed by public sector banks. Similarly median profit per branch is highest for foreign sector banks followed by public sector banks .Absolute variation is lowest for private sector banks and public sector banks .On the basis of relative measure of risk coefficient of variation lowest is for public sector banks and private sector banks. Conclusion can be drawn that foreign sector banks performed excellent in terms of profit per branch whereas public and private sector banks performed poorly on this indicator. Low coefficient of variation reveals consistent profit per

branch of public and private sector banks whereas variation is quite high in case of foreign sector banks.

Table-1.5: Profit per Branch. (Rs. in lakhs)

Type of Bank	Arithmetic Mean	Median	Standard Deviation (S.D.)	Coefficient of Variation (coefficient of variation.)
Public	54.19	51.56	27.65	0.51
Private	42.46	42.39	23.41	0.55
Foreign	1651.85	1132.75	1561.03	0.95

Source: Data has been compiled from various issues of Trend and Progress of banking in India (Published by RBI)
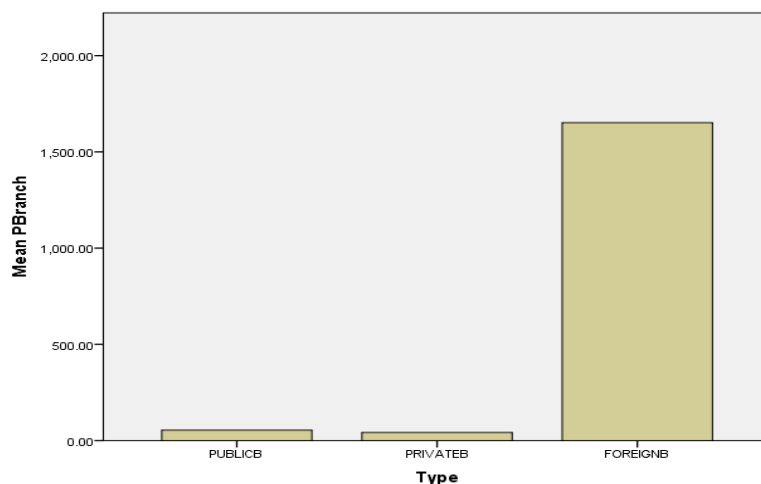

Figure-1.5: Mean Profit per Branch.

Further, to complete performance analysis of public, private and foreign sector banks, an attempt has been made to study profitability indicators.

Kolmogorov-Smirnov and Shapiro-Wilk Test: Kolmogorov-Smirnov and Shapiro-Wilk Tests are used to check for normality of distribution for public, private and foreign sector banks and is shown in table 1.11. Business per employee, profit per employee, business per branch, and profit per branch, credit deposit ratio, return on equity, return on assets, intermediation cost to total assets and return on advances seem to be normally distributed as per both Kolmogorov-Smirnov and Shapiro-Wilk test. So, null hypothesis of normality

cannot be rejected because significance value is greater than .05. In case of operating expenses per branch, mixed results have been found as per Kolmogorov-Smirnov and Shapiro-Wilk test. Thus, Smirnov-Wilk. test is applied as known to have great power to detect any deviation from normality we can say that operating expenses per branch of public sector and private sector banks do not seem to be normally distributed because significance value is less than .05 whereas operating expenses per branch of foreign sector banks seem to be normally distributed (because significance value is greater than .05)

Table-1.11: Test of Normality.

	Type	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Operating expenses per branch	Public Banks	.313	10	.006	.810	10	.019
	Private Banks	.200	10	.200[*]	.821	10	.026
	Foreign Banks	.278	10	.027	.861	10	.078
Business per employee	Public Banks	.145	10	.200[*]	.931	10	.453
	Private Banks	.242	10	.100	.858	10	.072
	Foreign Banks	.152	10	.200[*]	.944	10	.601
Profit per employee	Public Banks	.145	10	.200[*]	.984	10	.982
	Private Banks	.158	10	.200[*]	.946	10	.620
	Foreign Banks	.203	10	.200[*]	.875	10	.113
Business per branch	Public Banks	.139	10	.200[*]	.967	10	.857
	Private Banks	.168	10	.200[*]	.922	10	.371
	Foreign Banks	.181	10	.200[*]	.908	10	.267
Profit per branch	Public Banks	.232	10	.136	.878	10	.123
	Private Banks	.108	10	.200[*]	.989	10	.995
	Foreign Banks	.210	10	.200[*]	.917	10	.331

Levene's Test: Levene's Test is used to check the homogeneity of variance for public, private and foreign sector banks and mean has been used as the basis for comparison of variance and is shown in table 1.12. Table shows that business per employee, profit per employee, business per branch ,operating expenses per branch ,profit per branch, credit deposit ratio, return on equity ,return on asset, intermediation cost to total assets and return on advances the null hypothesis of

homogeneity of variance among various banks is rejected because significance value is less than .05.

Table-1.12: Test for Homogeneity of Variance.

		Levene Statistic	df1	df2	Sig.
Operating expenses per branch	Based on Mean	16.288	2	27	.000
	Based on Median	7.400	2	27	.003
	Based on Median and with adjusted df	7.400	2	9.006	.013
	Based on trimmed mean	13.291	2	27	.000
Business per employee	Based on Mean	12.608	2	27	.000
	Based on Median	12.525	2	27	.000
	Based on Median and with adjusted df	12.525	2	9.857	.002
	Based on trimmed mean	12.564	2	27	.000
Profit per employee	Based on Mean	11.130	2	27	.000
	Based on Median	6.731	2	27	.004
	Based on Median and with adjusted df	6.731	2	9.099	.016
	Based on trimmed mean	10.080	2	27	.001
Business per branch	Based on Mean	9.152	2	27	.001
	Based on Median	9.186	2	27	.001
	Based on Median and with adjusted df	9.186	2	16.995	.002
	Based on trimmed mean	9.120	2	27	.001
Profit per branch	Based on Mean	24.143	2	27	.000
	Based on Median	14.137	2	27	.000
	Based on Median and with adjusted df	14.137	2	9.009	.002
	Based on trimmed mean	22.193	2	27	.000

Source: Data has been compiled from various issues of Trend and Progress of banking in India (Published by RBI)

Kruskal-Wallis Test: To test the hypothesis of the dependent samples, Kruskal-Wallis Test has been used and hypothesis test summary is presented in table 1.13. Wherever null hypothesis of Kruskal-Wallis Test has been rejected, pair wise comparison to find out the exact pair of banks for which the variable is significantly different has been done. The analysis is conducted for each possible pair for each rejected null hypothesis.

Table-1.13: Hypothesis Test Summary.

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Operating expenses per branch is the same across different categories of banks.	Independent-Samples Kruskal-Wallis Test	.000	Reject the null hypothesis.
2	The distribution of Business per employee is the same across different categories of banks.	Independent-Samples Kruskal-Wallis Test	.000	Reject the null hypothesis.
3	The distribution of Profit per employee is the same across different categories of banks.	Independent-Samples Kruskal-Wallis Test	.000	Reject the null hypothesis.
4	The distribution of Business per branch is the same across different categories of banks.	Independent-Samples Kruskal-Wallis Test	.000	Reject the null hypothesis.
5	The distribution of Profit per branch is the same across different categories of banks.	Independent-Samples Kruskal-Wallis Test	.002	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Source: Data has been compiled from various issues of Trend and Progress of Banking in India (Published by RBI)

Pair wise Comparison of Each Possible Pair of Banks for which Operating Expenses per Branch are Significantly Different.

Sr. No.	Null Hypothesis	Test	Sig.	Decision
1	The distributions of operating expenses per branch are the same across different categories of banks.	Independent-Samples Kruskal-Wallis Test	.000	Reject the null hypothesis.

Pair wise comparison, presented in table 1.14, reveals that out of all available combinations, operating expenses per branch are significantly different only for the pairs of private-foreign banks and public- foreign banks. Operating expenses of private and public sector banks are significantly less than that of foreign sector banks. Because in these cases the adjusted significance of test statistic is less than .05, causing rejection of null hypothesis at 5% significance level .In case of pair of private-public banks adjusted significance is greater than .05, hence null hypothesis of equality of the variable for this pair cannot be rejected.

Table-1.14: Pair wise Comparison for Operating Expenses.

Sample1-Sample2	Test Statistic	Adjusted Significance
Private-Public Banks	5.00	.612
Private-foreign Banks	-17.500	.000
Public foreign Banks	-12.500	.004

Each row tests the null hypothesis that the sample 1 and sample 2 distributions are the same. Asymptotic significances (2-sided tests) are displayed .The significance level is .05.It further supports the above analysis.

Pair wise Comparison to find out the Exact Pair for which Business per Employee is Significantly Different.

Sr. No.	Null Hypothesis	Test	Sig.	Decision
2	The distribution of Business per employee is the same across different categories of banks.	Independent-Samples Kruskal-Wallis Test	.000	Reject the null hypothesis.

Pair wise comparison presented in table 1.15, reveals that out of all available combinations of business per employee are significantly different only for the pairs of private-foreign banks and public-foreign banks. Business per employee of foreign sector banks is significantly more than that of private and public sector banks. Because in these cases, the adjusted significance of test statistic is less than .05, causing rejection of null hypothesis at 1% significance level. In case of pair of private -public banks adjusted significance is greater than .05, hence null hypothesis of equality of the variable for this pair cannot be rejected.

Table-1.15: Pair Wise Comparison for Business per Employees

Sample1-Sample2	Test Statistic	Adjusted Significance
Private-Public Banks	5.800	.422
Private-Foreign Banks	-17.600	.000
Public-Foreign Banks	-11.800	.008

Each row tests the null hypothesis that the sample 1 and sample 2 distributions are the same. Asymptotic significances (2-sided tests) are displayed .The significance level is .05. It further supports the above analysis.

Pair wise Comparison to find out the Exact Pair of Banks for which Business per Employee is Significantly Different.

Sr. No.	Null Hypothesis	Test	Sig.	Decision
3	The distribution of profit per employee is the same across different categories of banks.	Independent-Samples Kruskal-Wallis Test	.000	Reject the null hypothesis.

Pair wise comparison presented in table 1.16 reveals that out of all available combinations of profit per employee are significantly different only for the pairs of private-foreign banks and public-foreign banks. Profit per employee of foreign sector banks is significantly more than that of public and private sector banks. Because in these cases the adjusted significance of test statistic is less than .05, causing rejection of null hypothesis at 5% significance level .In case of pair of private -public sector banks adjusted significance is greater than .05, hence null hypothesis of equality of the variable for this pair cannot be rejected.

Table-1.16: Pair wise Comparison for Profit per Employee.

Sample1-Sample2	Test Statistic	Adjusted Significance
Private-Public Banks	.200	1.00
Private-Foreign Banks	-13.600	.002
Public-Foreign Banks	-13.400	.002

Each row tests the null hypothesis that the sample 1 and sample 2 distributions are the same. Asymptotic significances (2-sided tests) are displayed .The significance level is .05. Thus it can be said that the results of Kruskal-Wallis Test to test the hypothesis of independent sample are valid.

Pair wise Comparison to find out the Exact Pair of Banks for which Business per Branch is Significantly Different.

Sr. No.	Null Hypothesis	Test	Sig.	Decision
4	The distribution of Business per branch is the same across different categories of banks.	Independent-Samples Kruskal-Wallis Test	.000	Reject the null hypothesis.

Pair wise comparison is presented in table 1.17, reveals that out of all available combinations of business per branch are significantly different only for the pairs of foreign-public. Business per branch of foreign sector banks is significantly more than that of public and private sector banks. Because in these cases, the

adjusted significance of test statistic is less than (.05), causing rejection of null hypothesis at 5% significance level. In case of pair of foreign-private banks and private -public banks adjusted significance is greater than (.01), hence null hypothesis of equality of the variable for this pair cannot be rejected.

Table-1.17: Pair wise Comparison for Business per Branch.

Sample1-Sample2	Test Statistic	Adjusted Significance
Foreign-Private Banks	8.000	.126
Foreign-Public Banks	15.700	.000
Private -Public Banks	7.700	.151

Each row tests the null hypothesis that the sample 1 and sample 2 distributions are the same. Asymptotic significances (2-sided tests) are displayed .The significance level is .05.Thus, the test clearly validate the above discussion.

Pair wise Comparison to find out the Exact Pair of Banks for which Profit per Branch is Significantly Different.

Sr. No.	Null Hypothesis	Test	Sig.	Decision
5	The distribution of Profit per branch is the same across different categories of banks.	Independent-Samples Kruskal-Wallis Test	.002	Reject the null hypothesis.

Pair wise comparison presented in table 1.18, reveals that out of all available combinations of profit per branch are significantly different only for the pairs of private-foreign banks and public-foreign banks. Profit per branch of foreign sector banks is significantly more than that of public and private sector banks. Because in these cases, the adjusted significance of test statistic is less than .05, causing rejection of null hypothesis at 5% significance level .In case of pair of private -public adjusted significance is greater than .05, hence null hypothesis of equality of the variable for this pair cannot be rejected.

Table-1.18: Pair wise Comparison for Profit per Branch.

Sample1-Sample2	Test Statistic	Adjusted Significance
Private-Public Banks	2.000	1.000
Private-Foreign Banks	-13.000	.003
Public-Foreign Banks	-11.000	.016

Each row tests the null hypothesis that the sample 1 and sample 2 distributions are the same. Asymptotic significances (2-sided tests) are displayed .The significance level is .05.

CONCLUSION

Conclusion can be drawn that mean and median business per employee is highest for foreign sector banks. Absolute variation is lowest for private sector banks. Coefficient of variation is lowest for private sector banks. Mean and median per employee is highest for foreign sector banks. Absolute variation is lowest for public sector banks. Coefficient of variation is lowest for public sector banks. Mean and median business per branch is highest for public sector banks. Absolute variation is lowest for foreign sector banks. Coefficient of variation is lowest for public sector banks. Mean and median operating expenses per branch are lowest for private sector banks Absolute variation is also lowest for private sector banks. Coefficient of variation is lowest for public sector banks. Mean and median profit per branch is highest for foreign sector banks Absolute variation is lowest for private sector banks. Coefficient of variation is lowest for public sector banks.

. Kolmogorov-Smirnov Test and Shapiro-Wilk Test are used to check the normality of distribution for public, private and foreign sector banks. Business per employee, profit per employee, business per branch, profit per branch, seem to be normally distributed as per both Kolmogorov-Smirnov test and Shapiro-Wilk test as null hypothesis of normality cannot be rejected because significance value is greater than .05

In case of operating expenses per branch we find mixed results as per Kolmogorov-Smirnov Test and Shapiro-Wilk test ,because Shapiro-Wilk test is known to have great power to detect any deviation from normality it can be said that operating expenses per branch of public Sector and private sector banks does not seem to be normally distributed because significance value is less than .05 whereas operating expenses per branch of foreign sector banks seems to be normally distributed (because significance value is greater than .05)

Levene's Test is used to check for homogeneity of variance for public, private and foreign sector banks and mean has been used as the basis for comparison of variance. In case of all the indicators, which includes business per employee, profit per employee, business per branch, operating expenses per branch, profit per branch the null hypothesis of homogeneity of variance among various banks is rejected because significance value is less than .05.

Non-Parametric Kruskal-Wallis Test is used to test the hypothesis. Where ever we have found that null hypothesis of Kruskal-Wallis test has been rejected, pair

wise comparison to find out the exact pair of banks for which the variable is significantly different has been conducted. The analysis is conducted for each possible pair for each rejected null hypothesis.

Business per employee of foreign sector banks is significantly more than that of private and public sector banks. Profit per employee of foreign sector banks is significantly more than that of public and private sector banks. Business per branch of foreign sector banks is significantly more than that of public and private sector banks. Operating expenses of private and public sector banks are significantly less than that of foreign sector banks. Profit per branch of foreign sector banks is significantly more than that of public and private sector banks.

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