Application of Factor and Cluster Analysis for an evaluation of Business Practices Models of Foreign Banks.

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14 July 2016

Title of Research Paper:-

Application of Factor and Cluster Analysis for an evaluation of Business Practices Models of Foreign Banks Post RBI Road MAP 2005 and during the period 2003 to 2013 with reference to India's Foreign Trade.

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Application of Factor and Cluster Analysis for an evaluation of Business Practices Models of Foreign Banks Post RBI Road MAP 2005 and during the period 2003 to 2013 with reference to India's Foreign Trade.

Abstract- The aim of this paper is to assess business practices models of 24 foreign banks operating in India post RBI Road Map 2005 and during the period 2003 to 2013 through the use of publicly available information. Business practices models have been evaluated by the application of factor analysis followed by cluster analysis. 23 variables related to working of foreign banks supported with 5 variables related to India's foreign trade were reduced into 8 factors by using factor analysis. Using these 8 factors cluster analysis was carried out to group 24 foreign banks into 3 clusters leading to three distinct business practices models. The dataset for analysis was for the period for financial years 2003-04 to 2012-13 and the focus is on post RBI Road Map-2005 for foreign banks. The foreign banks' sample consists of consistently operating 24 number foreign banks out of the universe consisting of 43 FBs operating in India between 2003-04 and 2012-13(ten years observation period).This study broadly covers foreign banks having legal entity and financial roots primarily in home country and entered in India for tapping Indian financial market in the form of term loans, cash credit, bridge loans, investments and funding for business activities (business financing operations) .

Key Words- Foreign Banks, Finance, Models, Foreign Trade, Financing

1Introduction: - Foreign banks are developing their Indian business along with increasing their client base and implementing potential opportunities for massive entry into the market. Most of the foreign banks have the greatest experience in working with private depositors, and also lending actively to the real and various business sectors. Foreign banks desire to enter the Indian market is understandable. Bilateral trade with various countries has been growing rapidly as economies are recovering from the global financial crisis. Foreign banks' principal focus is on promoting bilateral trade by offering finance at various stages of business cycle like product development, production, and marketing, import-export credit at pre-shipment and post-shipment stages, investment abroad and import of technology. Foreign banks operate a wide range of lending programs. Financial packages offered by the Foreign banks are competitive and multi-currency. Foreign banks is the crucial factor in international

economy. It is the dominant provider of capital in the form of advances & investments to various sectors like construction, automobile, energy, machinery industry covering also priority sectors including agriculture, MSE, weaker section and exports plus imports.

1.1 Foreign banks' their Current Scenario: - During the last two decades, India has seen an unprecedented degree of globalization especially in financial services. Foreign trade, financial system, technological advances, deregulation impact, industry and its major players' growth were identified as industry shaping milestones that gradually formed the today's foreign banks' models. As of March 2013, there are 43 foreign banks from 26 countries operating as branches and 43 foreign banks from 22 countries operating as representative offices in India. In addition, a number of foreign banks have also entered India via the Non-Banking Financial Company (NBFC) route, while a considerable number have set up captive centers in the country.

1.2 Significance of study: - Knowing under what models foreign banks operate for financing India's Foreign Trade and how models change in perspective to time or the foreign banks' operative approach can provide valuable insight into the whole financial system. Foreign banks are to develop commercially viable relationships with a target set of externally business oriented companies in India and their host countries by offering them comprehensive range of products and services, aimed at enhancing their internationalization efforts with the application of specific models.

1.3 Criticism against foreign banks: - It is observed that foreign banks operating in various developing countries are focused on a section of credit worthy customers and are involved in taking out cream of credit market. While carrying out financing operations these institutions in general neglect small or marginal customers. (Mandira Sarma and Anjali Prashad 2014). It has become hard to forecast, monitor or even follow how foreign banks conduct their business.

1.4 Foreign banks and Rural Regions in India: - It is argued that the developmental needs of rural regions in India may not be met by foreign banks. In India, out of approximately 600 districts, the number of districts without financial facility is nearly 400. Foreign banks are not going to enhance the reach of the financial system to millions of rural Indians manufacturers/service providers / businesses /citizens who do not have access to institutional finance.

2. Research Methodology: -

2.1 This research study is mainly based on secondary data.

2.1.1 First of all published literature relating to the Foreign Trade of India and financing of Foreign Trade was collected and consulted with special reference to FBs.

2.1.2 Secondly full advantage was taken of consultation with the faculty of various institutes related to Foreign Trade. For example, Indian Institute of Foreign Trade (IIFT), EXIM Bank, NIBM, Foreign Trade Organizations, Commerce wing in Indian High Commissions in various countries.

2.1.3 Thirdly a broad view was obtained on the role of FBs on the growth of Foreign Trade of India and financial models applied by FFIs while operating in India. 2.1.4 Lastly an analysis of the total operations of the FBs and their functional variables will be undertaken to find out how far FBs are able to achieve their objectives.

2.2 Data and Source of Data:-

The present study is predominantly empirical in nature and based on secondary data. This study involved basically published literature searches and various internet web site searches related to Foreign Trade and Foreign banks for obtaining secondary data.

2.3 Sample Design & selection of FFIs:-

For this study foreign banks are selected by random sampling method but belong to major countries related to India's Foreign Trade, a home country of foreign banks having a sizable bilateral trade with India and non-interrupted operation as indicated by profile of banks as per RBI.

2.4 Sampling Plan:

A sample of 24 FBs is selected among 43 FBs (Universe) satisfying various conditions as per sampling design. This corresponds to (24/43) = 55.81 % of total universe value. The study is conducted on the FBs operating in India during the financial year 2003-04 to 2012-13.

2.5 Data analysis techniques:-

For effective analysis of data secondary data, various statistical tools like trend analysis, averages, etc. software like IBM SPSS are used. Data analysis activity begins with proper tabulation of observed values for all the 28 variables year wise for 24 FBs during

the period 2003-04 to 2012-13. This is processed for calculation of Mean, Standard Deviation, Min, Max, Standard Error etc. The processed data is used to generate input for factor and cluster analysis.

2.6:- Scope of the Study:-This study broadly covers foreign banks having legal entity and financial roots primarily in home country and entered in India for tapping Indian market in the form of term loans, cash credit, bridge loans, equity participation and funding for business activities .

2.7 Limitations of the Study: - This study is limited to determination of effect of funding by foreign banks to Indian businesses/manufacturing/service operations and trading involving term loan or cash credit in the form of advances.

3.1 Review of Literature in short:-

The foreign banks model analysis offers a wide range of applications. Several authors already employed this type of analysis, generating promising results. The concept is used as an educative and analytical tool to explain and understand how foreign banks function. The term model is widely applied and capable of including a range of financial business aspects. Financial business objectives, core customers, product management, financial business strategies, organization infrastructure and many other strategic and operational business processes fit in foreign banks model term. Because of this capability to explain so much, foreign banks model term suffers an "identity crisis". While scholars do not agree what a model is, certain patterns are available and definitions emerge (Pedrotti (2014)) and (Osterwalder, Pigneur 2010). For the purpose of a more tangible applicability and necessary foreign banks model comparability, a work by Zott and Amit is used as a definition core for the model (Zott, Amit 2008). Applying similar conceptualization in the foreign bank business, the acquisition of necessary funds, loan service provisions and implied risk-taking can be interpreted as a base financial product market strategy, as these are the same products/services that foreign banks are competing for in the financial market The evolutionary logic of the foreign bank model is addressed by sympathizing with G. George's and A. Bock's thinking that organizations adjust and redesign their models under the effects of a changed operational environment (George, Bock 2011). The ability to adjust or transform the model is regarded as one of the major features in the financial business model logic.

3.2 Research Gap Analysis:-

3.2.1 Scope of Review: - The effect of opening of economy on growth of a country and various models of foreign bank has been critically covered. In general, researchers point out that foreign bank is an important factor for the GDP growth. Openness to foreign banks policy yields access to finance at a competitive rate.

3.2.2 Limitations of Review: - The effect of external financing from foreign banks on working of domestic institutions is not examined. There is no unanimous acceptance amongst researchers about specific models of foreign banks operating in host and home countries.

3.2.3 Scope for further review work: - Effect of external financing from foreign banks on working of domestic institutions may be reviewed in detail along with priority sector financing.

4.1 Analysis and Interpretation of Data:-

World over no bank is confined to a specific theoretical model. Although institutions operating in Europe, such as BNP Paribas, Deutsche Bank or Société Générale define themselves as retail-oriented institutions for marketing purposes, the research provides evidence that their business model is in fact closer to investment banking (Ayadi et.al. 2012). Similarly, the 24 selected foreign banks operating in India, are not relying on any specific theoretical model but making use of best of all business opportunities available.

4.2 Profile of selected foreign banks for study purpose and variables

4.2.1 During the year2003-04 to 2012-13 (ten years observation period) there are only twenty four of FFIs operating consistently in India. These foreign banks are selected for this research to generate models of foreign banks.

Annexure-1shows the details of these twenty four foreign banks including their respective case number allotted along with business, advances, investment.

4.2.2 Annexure-2 shows List of Variables and Factor/Component Score Coefficient Matrix.

4.2.3 The analysis for Foreign Trade Variables, is conducted using annual data for each foreign bank operating in India.

Data related to 28 variables pertaining to 24 FFIs along with values of averages for the period 2003-04 to 2012-13 ware processed which served as an input for conducting factor analysis to yield eight factors.

Based on the above, case wise calculation of values of eight factors was performed which served as an input for conducting cluster analysis to yield three clusters which are termed as Model-A, Model-B and Model-C. Annexure-3 Case wise calculations of values of 8 number factors.

4.3 Five variables pertaining to foreign trade: - These are derived based on gravity equations used in the research of foreign trade. The variables included in the export and import volume equations are real exports contribution by foreign bank, real imports contribution by foreign bank , real gross domestic product contribution by foreign bank (CTGDP), Modified export demand (M-EXDEM) because of foreign bank, and trade finance (FIN). For the export volume equation, export demand represents market share and is computed as the ratio of imports to total exports, specifically

M-EXDEM = Sum of $imports$ /Sum of $exports$ (4.3.1)

Where $imports$ is considered total imports into India.

$Exports$ represents total exports to all countries by India.

To examine how financial development and foreign trade finance influence trade flows, econometric models similar to those found in Arize (1996), Asafu-Adjeye (1999), and Ozturk and Kalyoncu (2009) were referred. Also, research work by Daniel Perez Liston, Lawrence McNeil (2013) was referred.

The proposed export volume equation is as follows:

Log ($exports$) = A0 +A1log (M-$EXDEM$) + A2FIN +A3FIN (4.3.2)

Where exports are real exports contribution by foreign bank, M-EXDEM is a proxy for export demand contribution by foreign bank, FIN is the trade finance proxy contribution by FFI. Now, Imports are modeled as follows:

Log ($imports$) = A0 +A1log (MGDP) +A2FIN (4.3.3)

Where imports, are real imports contribution by foreign bank and M-GDP is the real gross domestic product contribution by foreign bank. A0, A1, A2 are constants. From profile of foreign banks it is observed that foreign banks' Business is equal to number of Employees multiplied by Business per Employee. The definition of Proposed Modified Formulae for Foreign Trade Variables are as follows:-

(A) M-EXDEM =Modified variable for export demand as per foreign bank's financing= (Total Imports/Total Exports)*(Investments by foreign bank)*(Advances by foreign bank) where, (foreign bank's Business) = ('No. of Employees* 'Business /Employee')

(B) FIN = Modified Finance function = ((Investments by foreign bank+ Advances by foreign bank)/ (foreign bank's Business)

(C) EIR=Effective Interest Rate ==100*(Interest Income by foreign bank/Advances by foreign bank)

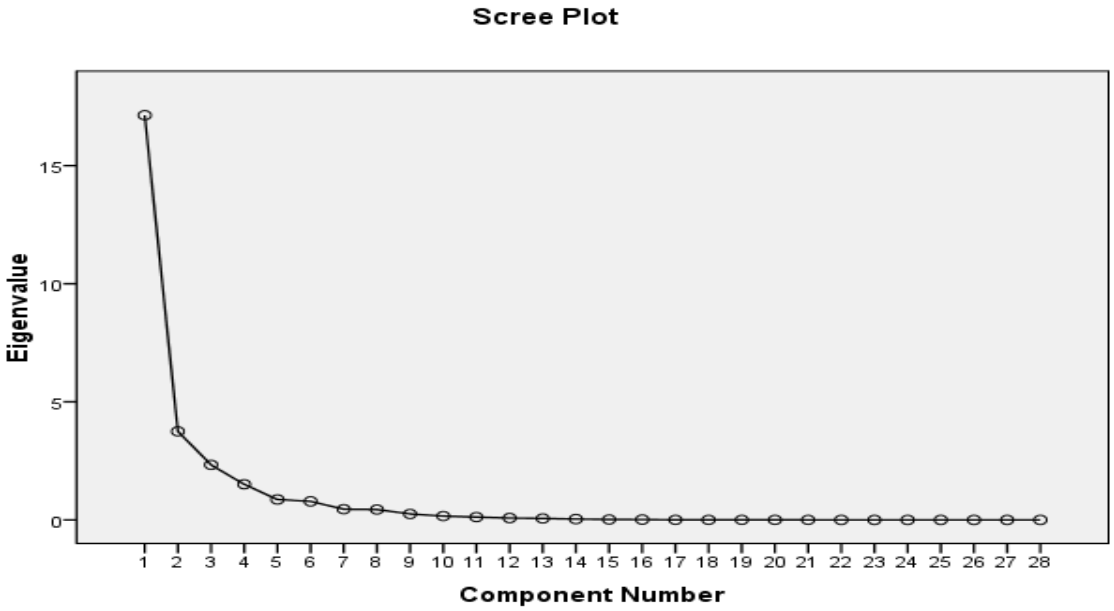
(D) Log (M-FT) =Log ((((Average FT)/ (Investments!*Advances!)))

(E) Log (CTGDP) =Log ((Investments!*Advances!)*('No. of Employees'!*'Business per Employee'!))

Based on the above definition values of foreign trade variables have been computed and used in working of factor analysis followed by cluster analysis.

4.4 Scree plot graph:-The scree plot graphs the eigen value against the factor number.

Graph 4.4.1:- Scree plot graph:-



Graph 4.4.1 shows Eigen values which are given in the first two columns of the table number 5.6 immediately above. From the **eighth factor** on, it is observed that the line is almost flat, meaning the each successive factor is accounting for smaller and smaller amounts of the total variance.

For determining the number of factors to retain we have used Cattell's (1966) scree test, which involves eye-balling the plot of the eigenvalues for a break or hinge (also referred to as an "elbow"). The rationale for this test is based on the idea that a few major factors will account for the most variance, resulting in a "cliff", followed by a shallow "scree" depicting the consistently small and relatively shallow error variance described by minor factors. Annexure- 2 indicates Component Score Coefficient Matrix. For a specific variable, Annexure-2 & 3 are used to calculate variable wise and further case

wise values of factors 1 to 8. Annexure 3 shows mean or average values of variables for the period 2003-04 to 2012-13. For example, for the variable 'Advances' the value of Factor 1 is 0.06. For case 1, the mean value for Advances is 0.07515. Then for the case 1, the value of Factor1 for a variable 'Advances' is equal to 0.06 multiply 0.07515= 0.004509. Using this method, the value of Factor1 is calculated for all variables 1 to 28 and the sum of these values is the value of Factor1 for case1. These case wise values of factors 1 to 8 are given in Annexure-4.

4.5 Cluster analysis:-

For this research study, cluster analysis is carried out as follows:-

4.5.1 Case (Foreign bank) wise computation of values of 8 factors which are generated using factor analysis.

4.5.2 Case (Foreign bank) wise calculation and recording of 8 factors in tabular format.

After processing the data for Cluster Analysis using SPSS, details related to Cluster Membership are as under:-

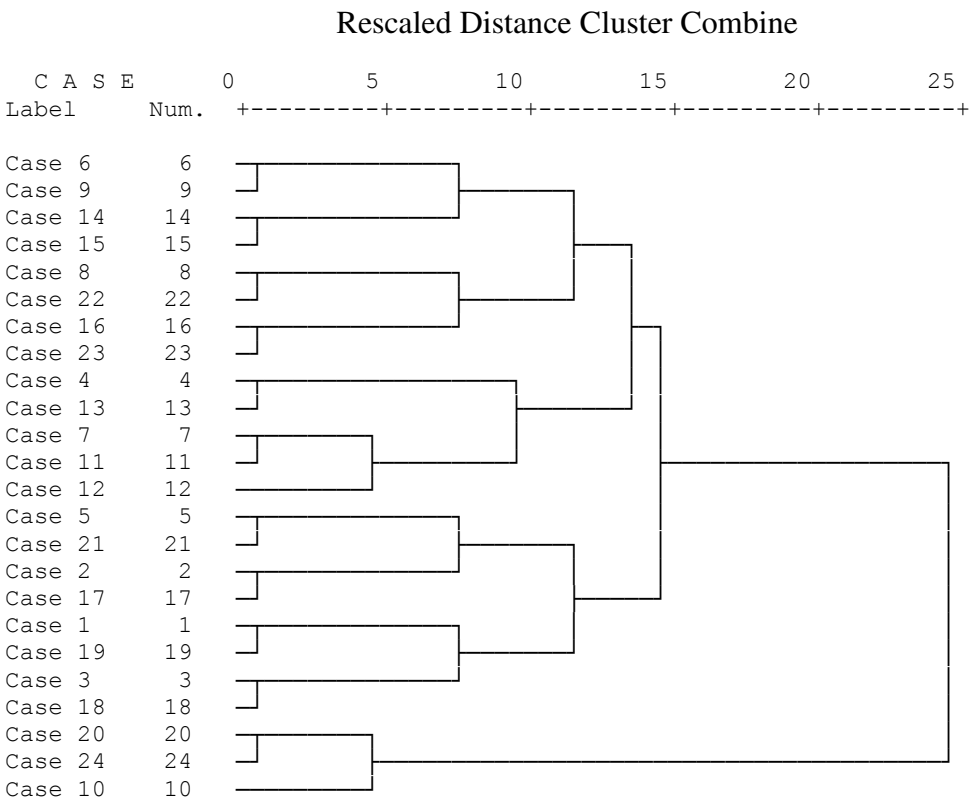
Table 4.5.2.1 Cluster Membership

Case	Clusters Number
1:Case 1	1
2:Case 2	1
3:Case 3	1
4:Case 4	2
5:Case 5	1
6:Case 6	2
7:Case 7	2
8:Case 8	2
9:Case 9	2
10:Case 10	3
11:Case 11	2
12:Case 12	2
13:Case 13	2
14:Case 14	2
15:Case 15	2
16:Case 16	2
17:Case 17	1
18:Case 18	1
19:Case 19	1
20:Case 20	3
21:Case 21	1
22:Case 22	2
23:Case 23	2
24:Case 24	3

Table 4.5.2.1 shows to which cluster a particular case is belonging. For example, case number 17 is in cluster number 1, case number 13 is in cluster number 2 and case number 24 is in cluster number 3.

Graph 4.5.1 shows "Dendrogram". In Greek language the word ' Dendro' means tree. Here the cases in 3 number clusters are presented in a 'Tree shape' or called as a Dendrogram. The branching-type-nature of the Dendrogram allows the researcher to trace backward or forward to any individual case or cluster at any level. It, in addition, gives an idea of how great the distance was between cases or groups that are clustered in a particular step, using a 0 to 25 scale along the top of the chart. While it is difficult to interpret distance in the early clustering phases (the extreme left of the graph), as you move to the right relative distance become more apparent. The bigger the distances before two clusters are joined, the bigger the differences in these clusters. To find a membership of a particular cluster simply trace backwards down the branches to the name.

Graph 4.5.1 Dendrogram using Centroid Method



4.6 Characteristics of Foreign Banks'- 3 Models: - This part of the research determines and discusses specific characteristics of the three models derived by the application of factor analysis and cluster analysis. The specific characteristics of models

are expressed in terms values of eight factors which are either positive or negative values.

4.6.1 Identification of Factors based on positive or negative scores: - Two distinct groups of all 8 factors are formed based on positive or negative value of factors with respect to 24 cases used in this research. Positive values are considered as positive push and negative values are considered as negative pull for the operational activities of foreign banks.

Table 4.6.1 Identification of Factors based on positive /negative scores

"Push" Factors (Positive Values)	"Pull" Factors (Negative Values)
Factor-F1-Balanced Score Factor	Factor-F3- Wages Factor
Factor-F2- Finance Function Factor	F5- Return on Assets Factor
F4- Effective Interest Factor	Factor-F6- Net NPA Factor
Factor-8- Return on Advances Factor	Factor-F 7-Cost of Funds Factor

4.6.2 Absolute Mean Values:-These values are actual or real mean values of eight factors with respect to specific Model either Model-A or model-B or Model-C. Models are segregated based on ascending order of mean values. Table 5.35 indicates ascending order of Models A to B to C and also furnishing mean values of eight factors with respect to specific model.

Table 4.6.2 Absolute Mean Values:-

Model	F1	F2	F3	F4	F5	F6	F7	F8
A	1190.752	114.5553	-218.467	560.8069	-142.191	-569.374	-570.518	549.0386
B	11419.46	991.8395	-1746.84	5168.439	-749.443	-5498.83	-5081.52	5539.352
C	119204.2	9457.528	-25604.8	53612.01	-14242.7	-60862.1	-59923.1	34007.19

4.6.3 Percentage Values: **-** These values are percentage of mean values of eight factors with respect to specific Model either Model-A or model-B or Model-C. Models are segregated based on ascending order of mean values. Table 5.34 indicates ascending

order of Models A to B to C and also furnishing percentage of mean values of eight factors with respect to specific model **Table 4.6.3 Percentage Mean Values**

Model	F1	F2	F3	F4	F5	F6	F7	F8
A	0.903	1.084	0.792	0.945	0.939	0.850	0.870	1.369
B	8.663	9.388	6.335	8.709	4.951	8.215	7.749	13.815
C	90.43	89.52	92.87	90.345	94.108	90.933	91.380	84.815

4.6.4 Grouping of Factors based on Positive Push & Negative Pull is carried out based on positive value or negative value of absolute mean value of factors and further converting it into percentage value. Table 4.6.4 shows above mentioned grouping. Factor F1, F2, F4 F8 represent Positive Push group whereas Factor F3, F5, F6, F7 represent Negative Pull group. Models are placed in ascending order of percentage values of eight factors.

Table 4.6.4 Grouping of Factors based on Positive Push / Negative Pull: - Positive Push is in blue color whereas Negative Pull is in red color

Model	% F1	% F2	% F4	% F8	% F3	% F5	% F6	% F7
A	*0.903*	*1.08440*	*0.94505*	*1.36932*	*0.79240*	*0.939527*	*0.8506966*	*0.870021974*
B	8.6632	9.388931	8.709689	13.81536	6.3359	4.9519362	8.2157595	7.7491580
C	90.433	89.52666	90.34525	84.81530	92.87160	94.10853	90.93354	91.38081

4.6.5 Model A: - This is basically cluster 1. It includes eight cases out of 24 cases analyzed during the research. Table 4.6.5 indicates eight cases along with values of eight factors with respect to specific case. This table also shows maximum values, minimum values, mean value and value of standard deviation of eight factors with respect to cases involved in this research. Here, both absolute mean values and percentages mean values of eights factors are at the minimum or the least level. Hence this model is termed as “Also Ran Low End Economy model” of the foreign banks, meaning foreign banks covered under this model are just maintaining their existence by carrying out their operational activities while operating in India. These foreign banks lack initiative to tap various business opportunities available under the RBI roadmap with the application of variables like advances, investment, EIR etc.to widen their prospective customer base and increase income plus appropriate profitability.

Table 4.6.5 Model A – 8 Cases

	Case No.	Factor-F1	Factor-F2	Factor-F3	Factor-F4	Factor-F5	Factor-F6	Factor-F7	Factor- F8
	1	153.19	15.65	-8.74	93.12	-7.61	-55.33	-66.94	101.85
	2	1454.31	142.33	-397.18	698.33	-323.27	-758.98	-816.36	267.57
	3	831	77.16	-110.63	373.25	-0.37	-353.76	-354.63	781.64
	5	1098.7	101.91	-239.53	514.67	-181.21	-549.23	-564.5	327.67
	17	1681.87	166.83	-302.51	792.36	-181.97	-809.67	-812.95	867.27
	18	3051.33	283.78	-489.79	1407.18	-299.84	-1452.44	-1363.34	1360.89
	19	70.58	5.77	7.55	50.89	-16.47	-24.49	-41.6	5.31
	21	1185.04	123	-206.89	556.66	-126.8	-551.09	-543.83	680.11
Max		3051.33	283.78	7.55	1407.18	-0.37	-24.49	-41.6	1360.89
Min		70.58	5.77	-489.79	50.89	-323.27	-1452.44	-1363.34	5.31
Mean		1190.75	114.56	-218.47	560.81	-142.19	-569.37	-570.52	549.04
S.Deviation		883.29	83.21	165.79	403.88	119.9	430.39	407.51	426.54

4.6.6 Model B: - This is basically cluster 2. It includes thirteen cases out of 24 cases analyzed during the research. Table 4.6.6 indicates thirteen cases along with values of eight factors with respect to specific case. This table also shows maximum values, minimum values, mean value and value of standard deviation of eight factors with respect to cases involved in this research. . Here, both absolute mean values and percentages mean values of eights factors are at the moderate or the medium level. Hence this model is termed as "Progressive Medium End model" of the foreign banks, meaning foreign banks covered under this model are pushing their presence by carrying out their operational activities while operating in India. These foreign banks possess initiative to tap various business opportunities available under the RBI roadmap with

the application of variables like advances, investment, EIR etc.to widen their prospective customer base and increase income plus appropriate profitability.

Table 4.6.6 Model B- 13 Cases

	Case No.	Factor-F1	Factor-F2	Factor-F3	Factor-F4	Factor-F5	Factor-F6	Factor-F7	Factor-F8
	4	15896.68	1542.18	-2306.81	7191.02	-1152.21	-7557.46	-7119.14	7919.86
	6	304.73	37.83	-41.68	170.63	-34.55	-135.81	-143.32	197.56
	7	22665.8	1940.68	-2124.05	10303.29	-492.44	-10379.3	-8549.24	13907.07
	8	12253.56	992.25	-2081.33	5505.55	-903.19	-5976.61	-5587.55	5420.26
	9	355.66	37.53	-44.35	179.31	-39.49	-151.5	-158.28	255.81
	11	18696.81	1503.12	-3803.4	8369.58	-1761.95	-9471.92	-9043.4	6467.22
	12	34207.79	2856.54	-6118.46	15419.74	-3535.42	-16685.7	-16132.8	12517.4
	13	16735.02	1585.96	-2524.03	7591.41	-1043.39	-8108.74	-7602.53	8649.79
	14	221.58	21.98	-59.45	178.26	-43.8	-93.66	-128.57	156.14
	15	459.39	43.67	-53.35	250.24	-16.73	-198.37	-199.72	303.22
	16	8459.65	666.52	-619.74	3805.72	544.05	-3881.18	-3113.49	7185.68
	22	10117.42	839.34	-2107.76	4511.42	-957.88	-5106.27	-4983.96	3782.22
	23	8078.86	826.32	-824.54	3713.54	-305.75	-3738.27	-3297.83	5249.35
Max		34207.79	2856.54	-41.68	15419.74	544.05	-93.66	-128.57	13907.07
Min		221.58	21.98	-6118.46	170.63	-3535.42	-16685.7	-16132.8	156.14
Mean		11419.46	991.84	-1746.84	5168.44	-749.44	-5498.83	-5081.52	5539.35
S.Deviation		9848.16	837.2	1716.09	4430.17	1003.4	4776.28	4512.09	4417.25

4.6.7 Model C: - This is basically cluster 3. It includes three cases out of 24 cases analyzed during the research. Table 4.6.7 indicates three cases along with values of eight factors with respect to specific case. This table also shows maximum values, minimum values, mean value and value of standard deviation of eight factors with respect to cases involved in this research. Here, both absolute mean values and percentages mean values of eights factors are at the maximum or at the highest level. Hence this model is termed as "High End Star model" of the foreign banks, meaning foreign banks covered under this model are leaving no chance for pushing their presence at the highest level by carrying out their operational activities while operating in India. These foreign banks possess proactive initiative to tap various business opportunities available under the RBI roadmap with the application of variables like advances, investment, EIR etc.to widen their prospective customer base and increase income plus appropriate profitability

Table 4.6.7 Model C- 3 Cases

Case No.	Factor-F1	Factor-F2	Factor-F3	Factor-F4	Factor-F5	Factor-F6	Factor-F7	Factor- F8
10	126632.4	10025.12	-27215.2	57051.91	-14982.3	-64862.6	-63737.3	37029.63
20	119813.6	9374.47	-25687	53510.27	-13749.3	-60785.4	-59833.6	33710.03
24	111166.7	8973	-23912.4	50273.86	-13996.5	-56938.4	-56198.4	31281.9
Max	126632.4	10025.12	-23912.4	57051.91	-13749.3	-56938.4	-56198.4	37029.63
Min	111166.7	8973	-27215.2	50273.86	-14982.3	-64862.6	-63737.3	31281.9
Mean	119204.2	9457.53	-25604.8	53612.01	-14242.7	-60862.1	-59923.1	34007.19
S.Deviation	6328.53	433.53	1349.62	2768.06	532.61	3235.46	3078.4	2355.89

Graph 4.6.7 drawn below, indicate co-ordinate position of Model-A, Model-B and Model-C. As shown by this graph, Model- A covers least or minimum area, Model-B covers area at moderate or medium level whereas Model-C covers the maximum or highest area on the graph. This is mainly because of ascending order of values of eight

factors of these models. **Graph 4.6.7 Simple Radar type graph indicating co-ordinate position of models: -** Graph 5.3 simple radar type indicates position of models by drawing simple lines.

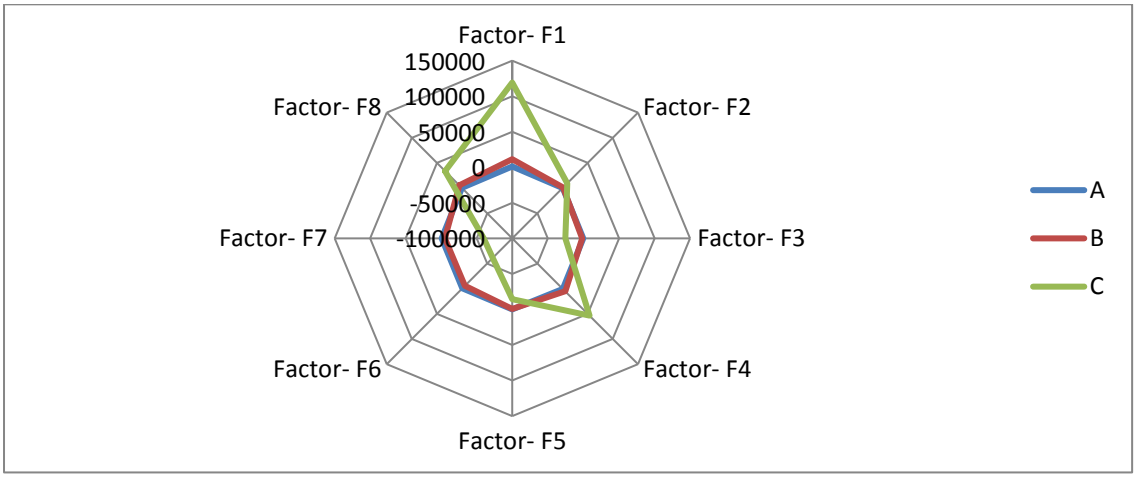
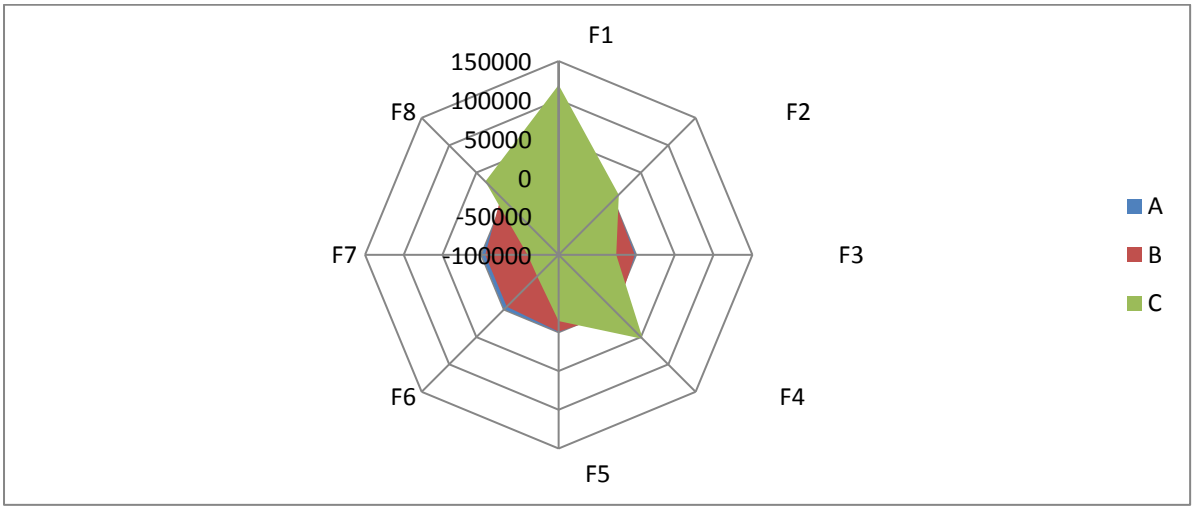


Table 4.6.7 Intensity of Positive Push and Negative Pull amongst models

Model	Positive Push	Negative Pull
A	Minimum emphasis on F1,F2,F4 and F8	Minimum emphasis on F3,F5,F6 and F7
B	More emphasis on F1,F2,F4 and F8	More emphasis on F3,F5,F6 and F7
C	Highest emphasis on F1,F2,F4 and F8	Highest emphasis on F3,F5,F6 and F7

Graph 4.6.8 Filled Radar type graph indicating co-ordinate position of models: - Graph 4.6.8 filled radar type indicates position of models by highlighting areas covered by respective model.



4.7 Testing of Hypothesis: -

Hypothesis Number 1: -

H1: Foreign banks (FBs) provide services to Indian companies at a very competitive and concessional cost.

HO: Foreign banks (FBs) do not provide services to Indian companies at a very competitive and concessional cost.

This hypothesis tested using statistical test, table supported with graph by comparing A)Foreign banks' cost of funds, B) Return on advances and C) Return on assets against State Bank of India (SBI) since in India SBI is the lead financial institution for providing advances to manufacturing & trading.

Here we are comparing Foreign banks' cost of funds against SBI's cost of funds since in India SBI is the lead financial institution for providing advances to manufacturing & trading.

Table 4.7.1 FBs' Cost of Funds - Comparison with State Bank of India

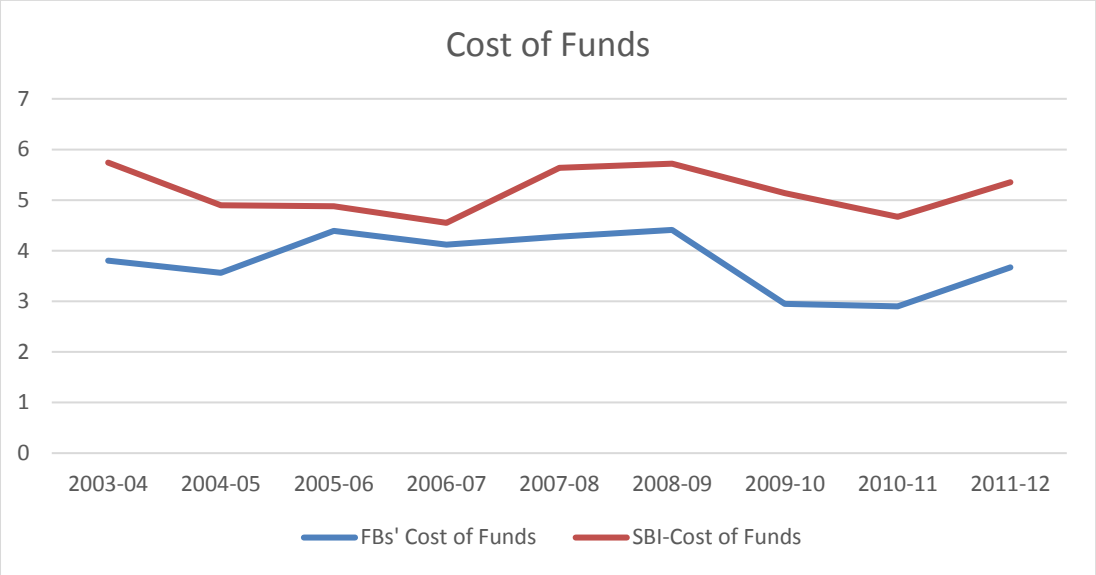
	FBs (24) N Average		SBI-Average
Year	Cost of Funds	Year	Cost of Funds
2003-04	3.80	2003-04	5.74
2004-05	3.56	2004-05	4.90
2005-06	4.39	2005-06	4.88
2006-07	4.12	2006-07	4.55
2007-08	4.28	2007-08	5.64
2008-09	4.41	2008-09	5.72
2009-10	2.95	2009-10	5.14
2010-11	2.90	2010-11	4.67
2011-12	3.67	2011-12	5.35
2012-13	3.93	2012-13	5.63
Average=	3.80	Average=	5.22

Statistical Test: - Here x bar= 5.22, μo =3.80, σ= 0.43109, n=24

$$Zc = \frac{\text{x bar} - \mu o}{\sigma/\sqrt{n}}$$

= (5.22-3.80)/ (0.43109/ (24^0.5)) = (1.42)/ (0.43109)/ 4.8989 =1.42/0.0879 =16.15 Distribution of test statistic is N (0, 1). So critical value for right tailed test and for 5% level of significance is 1.645. Since, computed value > critical value at 5% level of significance, we reject Ho at 5%level of significance in favor of H1 and conclude that Foreign banks provide services to Indian companies at a very competitive and concessional cost because FBs' cost of Funds is lower than SBI's Cost of Funds.

Graph 4.7.1 FBs' Cost of Funds- Comparison with State Bank of India (SBI)



From above table and graph it is observed that FBs cost of Funds is lower than SBI's Cost of Funds during the observation period. Hence H1 is acceptable whereas HO is rejected.

B) Here we are now, comparing FBs return on advances against SBI's return on advances since in India SBI is the lead financial institution for providing advances to manufacturing & trading

Table 4.7.2 FBs' Returns on Advances – Comparison with State Bank of India (SBI)

	FBs 24(N) Average		SBI-Average
Year	Return on Advances	Year	Return on Advances
2003-04	4.27	2003-04	1.88
2004-05	3.66	2004-05	2.34
2005-06	3.08	2005-06	2.74
2006-07	5.16	2006-07	3.74
2007-08	4.96	2007-08	3.70
2008-09	6.57	2008-09	3.95
2009-10	5.35	2009-10	3.48
2010-11	4.74	2010-11	3.97
2011-12	5.04	2011-12	4.63
2012-13	4.72	2012-13	3.83
Average=	4.75	Average=	3.42

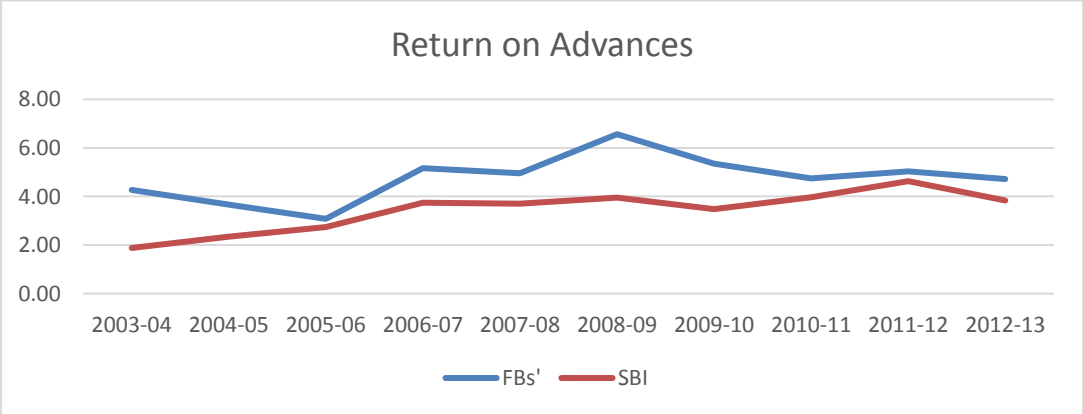
Statistical Test: - Here x bar= 4.75, µo =3.43, σ= 0. 0.90339, n=24

$$Zc = \frac{\text{x bar} - \mu o}{\sigma/\sqrt{n}}$$

= (4.75-3.43)/ (0.90339/ (24^0.5)) = (1.32)/ (0.90339)/ 4.8989 =1.32/0.1844 =7.15

Distribution of test statistic is N (0, 1). So critical value for right tailed test and for 5% level of significance is 1.645. Since, computed value > critical value at 5% level of significance, we reject Ho at 5%level of significance in favor of H1 and conclude that FFIs provide services to Indian companies at a very competitive and concessional cost because FBs' Return on Advances is higher than SBI's Return on Advances.

Graph 4.7.2 FBs' Return on Advances- Comparison with State Bank of India



From above statistical tests, tables and graph it is observed that FBs' return on advances is higher than SBI's return on advances during the observation period. Hence H1 is acceptable whereas HO is rejected.

C) Here we are now, comparing FBs return on assets against SBI's return on assets since in India SBI is the lead financial institution for providing advances to manufacturing & trading.

Table 4.7.3 FBs' Returns on Assets - Comparison with State Bank of India

	FBs 24 (N) Average		SBI-Average
Year	Return on Advances	Year	Return on Advances
2003-04	1.87	2003-04	0.94
2004-05	0.87	2004-05	0.99
2005-06	1.71	2005-06	0.89
2006-07	1.95	2006-07	0.84
2007-08	2.65	2007-08	1.01
2008-09	2.69	2008-09	1.04
2009-10	1.41	2009-10	0.88
2010-11	1.91	2010-11	0.71
2011-12	2.23	2011-12	0.88
2012-13	2.16	2012-13	0.91
Average=	1.95	Average=	0.91

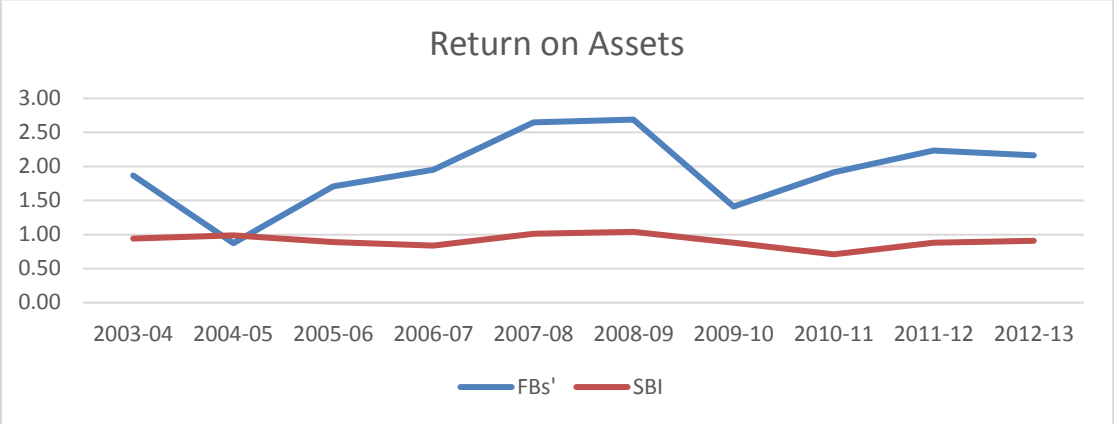
Statistical Test: - Here x bar= 1.95, µo =0.91, σ= 0.51709, n=10

$$Zc = \frac{\text{x bar} - \mu o}{\sigma/\sqrt{n}}$$

= (1.95-0.91)/ (0.51709/ (24^0.5)) = (1.04)/ (0.51709)/ 4.8989 =1.04/0.0.1055 = 9.85

Distribution of test statistic is N (0, 1). So critical value for right tailed test and for 5% level of significance is 1.645. Since, computed value > critical value at 5% level of significance, we reject Ho at 5%level of significance in favor of H1 and conclude that FBs provide services to Indian companies at a very competitive and concessional cost because FBs Return on Assets is higher than SBI's Return on Assets.

Graph 4.7.3 FBs' Return on Assets- Comparison with State Bank of India (SBI)



From above statistical test, table and graph it is observed that FBs return on assets is higher than SBI's return on assets during the observation period. Hence H1 is acceptable whereas HO is rejected.

Hypothesis Number 2: -

4.7.2 H1: Foreign Banks (FBs) provide advisory and promotional services to Indian exporters and importers which results in enhancing Foreign Trade.

4.7.2.1 HO: Foreign Banks (FBs) provide advisory and promotional services to Indian exporters and importers which do not result in enhancing Foreign Trade.

This hypothesis is tested using statistical test-regression analysis and table supported with graph by comparing

A) FBs' Operating Expenses - Independent Variable

B) FBIs' Total Expenses - Independent Variable

C) Foreign Trade (FT) - Dependent Variable

Statistical Test using Regression Analysis: - y= a + bx

x = Operating Expenses, independent variable, y = Foreign Trade (FT), dependent variable,

Table 4.7.4 India's Foreign Trade and FBs' Op. Expenses INR million

Year	Op. Expenses (xi)	FT (yi)	xi-x bar	yi-y bar	(xi-x bar)^2	(yi-y bar)^2	(x-x bar)*(y-y bar)
2003-04	29560	6524750	-51018.9	-14567171	2602928627	2.122E+14	7.43201E+11
2004-05	34910	8764050	-45668.9	-12327871	2085648847	1.52E+14	5.63E+11
2005-06	47440	11168270	-33138.9	-9923651	1098186998	9.848E+13	3.28859E+11
2006-07	63490	14122850	-17088.9	-6969071	292030660.4	4.857E+13	1.19094E+11
2007-08	89290	16681760	8711.095	-4410161	75883183.07	1.945E+13	-3.8417E+10
2008-09	102875.3	22151910	22296.36	1059989	497127776.3	1.124E+12	23633898884
2009-10	95775.09	22092700	15196.18	1000779	230923959.5	1.002E+12	15208020226
2010-11	108546.6	28263890	27967.69	7171969	782191650.4	5.144E+13	2.00583E+11
2011-12	113983.1	38114220	33404.19	17022299	1115840137	2.898E+14	5.68616E+11
2012-13	119919	43034810	39340.1	21942889	1547643106	4.815E+14	8.63235E+11
	X bar= 80578.9	Y bar= 21091921			SSX= 10328404944	SSY= 1.355E+15	SSXY= 3.38701E+12

b=SSXY/SSX = 3.38701E+12 /10328404944=**327.9315653** and a= y bar –b * x bar = 21091921 – (327.9315653*80578.9) = **-5332443.807** Value b =327.9315653 is the change in the value of Y for a unit change in the value of X. The intercept is a constant or the value of Y when X is zero. The values of a and b obtained using least square method are called as least square estimates (LSE) of a and b. The values of a and b obtained using least square method are called as least square estimates (LSE) of a and b. Also the relation between the correlation coefficient for X and Y (r) and LSE of b is given as under:-

$$\boldsymbol{r = b\sqrt{(\int_{i=1}^{i=n} (xi - xbar)\text{^}2)/(\int_{i=1}^{i=n} yi - ybar)\text{^}2)}}$$

= b√((SSX)/SSY)

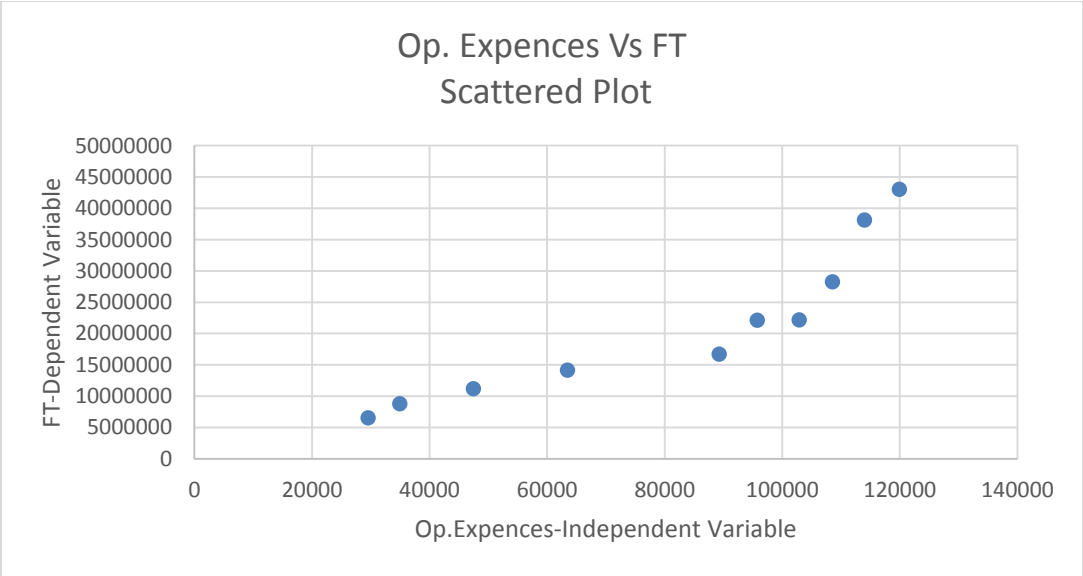
=327.9315653 * (10328404944 /1.355E+15)^0.5 = **0.905378554** In the above model Y=a + Bx + error , if b = 0 , then the model cannot be considered as a linear model. Therefore, here we test Ho: b=0 against Ha: b≠0, the test statistic is $\boldsymbol{Tc} = \frac{\boldsymbol{bbar}}{\sqrt{\boldsymbol{SSY}/(\boldsymbol{n-2})\boldsymbol{SSX}}}$

= (327.9315653) / ((1.355E+15)/((24-2)*(10328404944)))^0.5

= **4.246601837**

At 5% level of significance and 22 d.f., the critical value using t distribution is 2.074 which is smaller than the computed value. Therefore, at 5% level of significance we reject the null hypothesis and conclude that there is an evidence of linear relationship between the independent variable-Op. Expenses and the dependent variable-FT

Graph 4.7.4 Operating Expenses Vs FT- Scattered Plot



Using SPSS the calculated value of 'R' is 0.905 and 'R square' is 0.819. Also the calculated value of standardised coefficient 'Beta' is 0.905. Since these values are closer to 1, it is concluded that there exists linear correlation between independent variable 'Operating Expenses' and dependent variable 'Foreign Trade'. This means that regression explains most of the variability in the dependent variable and the fitted model is good.

Table 4.7.5 India's Foreign Trade and FBs' Total Expenses INR million

: - Statistical Test using Regression Analysis: - y= a + bx

x = Total Expenses, independent variable y = Foreign Trade (FT), dependent variable

Year	Total Expenses (xi)	FT (yi)	xi-x bar	yi-y bar	(xi-x bar)^2	(yi-y bar)^2	(x-x bar)*(y-y bar)
2003-04	64670	6524750	-101342.089	-14567171	10270219003	2.12202E+14	1.47627E+12
2004-05	68030	8764050	-97982.089	-12327871	9600489765	1.51976E+14	1.20791E+12
2005-06	88920	11168270	-77092.089	-9923651	5943190186	9.84788E+13	7.65035E+11
2006-07	126360.8805	14122850	-39651.20852	-6969071	1572218337	4.8568E+13	2.76332E+11
2007-08	179156.2976	16681760	13144.20862	-4410161	172770220.2	1.94495E+13	-57968076220
2008-09	214029.0414	22151910	48016.95243	1059989	2305627721	1.12358E+12	50897441391
2009-10	176456.7485	22092700	10444.65947	1000779	109090911.3	1.00156E+12	10452795855
2010-11	204374.008	28263890	38361.919	7171969	1471636829	5.14371E+13	2.7513E+11
2011-12	248835.414	38114220	82823.325	17022299	6859703164	2.89759E+14	1.40984E+12
2012-13	289288.5	43034810	123276.411	21942889	15197073509	4.8149E+14	2.70504E+12
	X bar= 166012.089	Y bar= 21091921			SSX= 53502019646	SSY= 1.35549E+15	SSXY= 8.11894E+12

b=SSXY/SSX =8.11894E+12 /53502019646 = **151.7501592** and a= y bar –b * x bar =21091921 - 151.7501592 *166012.089 = **-4100439.935**. The value b =151.7501592 is the change in the value of Y for a unit change in the value of X. The intercept is a constant or the value of Y when X is zero. The values of a and b obtained using least square method are called as least square estimates (LSE) of a and b. Also the relation between the correlation coefficient for X and Y (r) and LSE of b is given as under:-

$$\boldsymbol{r = b\sqrt{(\int_{i=1}^{i=n} (xi - xbar)\text{^}2)/(\int_{i=1}^{i=n} yi - ybar)\text{^}2)}}$$

= b√((SSX)/SSY)

=151.7501592 * (53502019646 /1.35549E+15) ^0.5= **0.953380104**

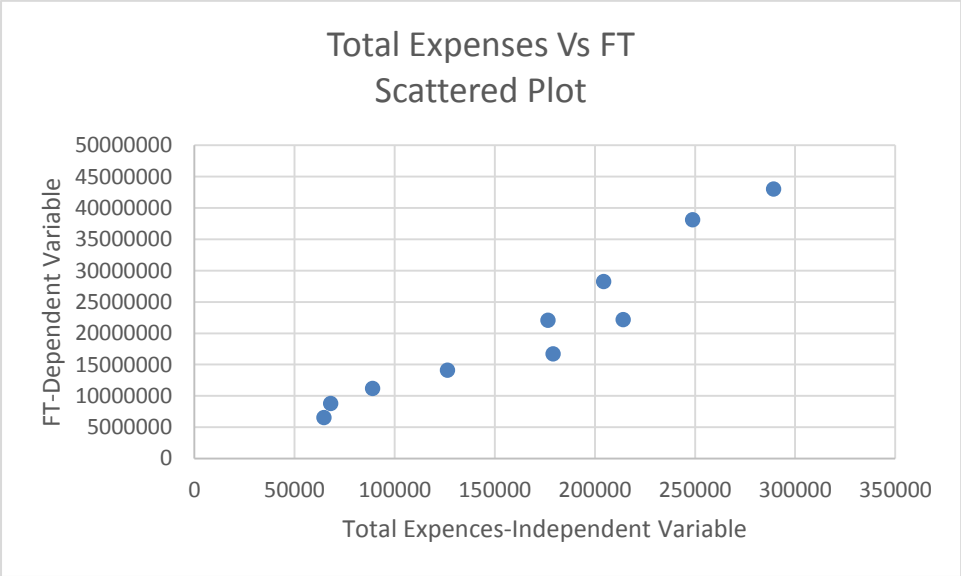
In the above model Y=a + Bx + error , if b = 0 , then the model can not be considered as a linear model. Therefore, here we test Ho: b=0 against Ha: b≠0, the test statistic is

$$Tc = \frac{bbar}{\sqrt{SSY/(n-2)SSX}}$$

= (151.7501592) / ((1.35549E+15)/((24-2)*(53502019646)))^0.5

= **4.471749067** At 5% level of significance and 22 d.f., the critical value using t distribution is 2.074 which is smaller than the computed value. Therefore, at 5% level of significance we reject the null hypothesis and conclude that there is an evidence of linear relationship between the independent variable- Total Expences and the dependent variable-Foreign Trade FT

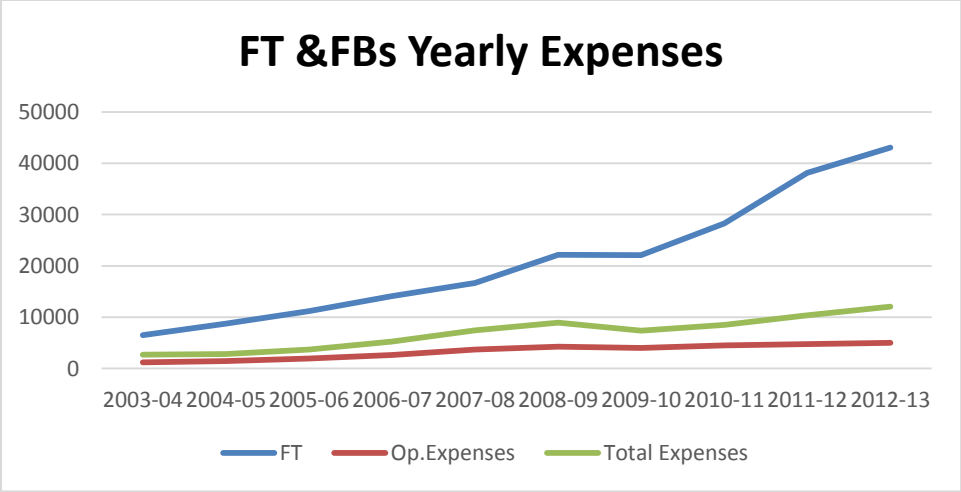
Graph 4.7.5 Total Expenses Vs FT- Scattered Plot



Graph 4.7.6 India's Foreign Trade and FBs' Yearly Expenses

Values for FT in INR million x 1000 whereas

Values for Op. Expenses & Total Expenses in INR million



Using SPSS the calculated value of 'R' is 0.953 and 'R square' is 0.909. Also the calculated value of standardised coefficient 'Beta' is 0.953. Since these values are closer to 1, it is concluded that there exists linear correlation between independent variable 'Total Expenses' and dependent variable 'Foreign Trade'. This means that regression explains most of the variability in the dependent variable and the fitted model is good. Advisory and promotional services are part of operating expenses and total expenses. From above statistical tests, tables and graphs it is observed that with increase in operating expenses or total expenses there is increase in foreign trade. There exists a linear relationship between an independent variable and a dependent variable. This follows the equation y=a +bx. Hence H1 is acceptable whereas HO is rejected.

4.8 Conclusions: -Conclusions emerging out on the basis of the research are as under:

4.8.1 Dependency: - The present study reveals that the three models of foreign banks covering financing of foreign trade depends on the indicators covered under Factor F1, Factor F2, Factor F4, Factor F8 involving variables in principle like M-EXDEM, log (M-FT), Net Profit, FIN, Profit per Employee, EIR, Return on Advances, Profit per Employee, Business per Employee which are termed as "Positive Push" having positive values.

4.8.2 Enhancing probability of financing: - So to enhance the probability of the foreign banks for financing covering foreign trade, the other aspects should be taken care of which are covered under Factor F3, Factor F5, Factor F6 and Factor F7.

4.8.3 It is concluded that there is no authentic declaration of self – defined model by any foreign banks operating in India.

4.8.4 Covering Basic Elements: - Although all 24 cases of foreign banks are covering elements of basic business models like interest model, investment model, retail financing model or profitability model etc., emphasis on these basic elements varies from institution to institution. Hence, these foreign banks are grouped into three clusters possessing totally different values for all eight number factors as indicated by the graph.

4.8.5 Least & Medium Values:-We can very well conclude that 'Low End Also Ran 'Model-A possesses least values for eight factors indicating that these foreign banks are carrying out minimum acceptable level of business including financing of foreign trade as indicated by the values of factors whereas, 'Progressive Medium End Economic' Model-B possesses medium level for eight factors.

4.8.6 Highest Level:-It is conclude that 'High End Star 'Model-C possesses highest level for eight factors indicating that these FFIs are carrying out excellent level of business including financing of foreign trade as indicated by the values of eight factors.

4.8.7 Since, the contribution of foreign banks in overall credit allocation amounts to a small figure of mere 5.75 percent it is concluded that the foreign banks are not effectively using their available resources to counter the challenges posed by the other financial institutions especially for the allocation of advances to manufacturing /trading.

4.8.8 Since, the contribution of foreign banks in overall investment allocation amounts to a non-significant figure of mere 7.84 percent it is concluded that the foreign banks are not taking full advantage of the buoyancy in economic growth and not expanding financial activities in all segments including priority sector.

4.8.9 Based on the research findings it is concluded that the foreign banks are not initiating efforts on adopting the new technologies in order to improve their customer service levels and provide new delivery platforms to them, especially in the rural area other than metro cities and urban area.

4.8.10 On the basis of the study, we conclude that only Model-C possesses prominent values for eight Factors considering involved positive push or negative pull for financing of foreign trade for foreign banks during the observation period. This trend is followed by Model-B and further by Model-A with drastic decrease in values for eight Factors. Positive push effect of Factors indicates that the foreign banks maintain the proper balance in financial/foreign trade variables and able to minimize the financial burden on it, which directly enhances the profitability and foreign banks' survival in stiff competition with grace. Thus, it is concluded that this research is helpful to the foreign banks to become more competitive and compatible in the light of RBI's guidelines and roadmap for foreign banks operating in India.

BIBLIOGRAPHY

1 Amit R., Zott C.(2001) "Value Creation in E-Business". Strategic Management Journal, 22(6/7), pp. 493.

2 Amit. R, Zott C. (2011) "The business model"Journal of management, 37(4), pp. 1019

3 A.Afuah (2004) "Business models: a strategic management approach". Boston: McGraw-Hill/Irwin.

4 AYADI, R., ARBAK, E. and DE GROEN, W.P., 2011. BUSINESS MODELS IN EUROPEAN BANKING: A PRE-AND POST-CRISIS SCREENING. Centre for European Policy Studies: Centre for European Policy Studies.

5 AYADI, R., ARBAK, E. and DE GROEN, W.P., 2012. REGULATION OF EUROPEAN BANKS AND BUSINESS MODELS: TOWARDS A NEW PARADIGM? Centre for European Policy Studies: Centre for European Policy Studies.

6 Adrian Blundell-Wignall and Caroline Roulet (2013) "Business models of banks, leverage and the distance-to-default" OECD Journal: Financial Market Trends Volume 2012/2

7 Adrian Blundell-Wignall, Paul Atkinson and Caroline Roulet (2014) "Bank business models and the Basel system Complexity and interconnectedness" OECD Journal: Financial Market Trends Volume: 2013, Issue: 2Pages 43–68

8 Benson Kunjukunju(2006) "Reforms in Banking Sector and Their Impact in Banking Services," SAJOSPS, July-December 2006, pp.77-81

9 Christian Weller, (1999) "The Connection between More Multinational Banks and Less Real Credit in Transition Economies, Working Paper B8, Center for European Integration Studies, Bonn, 1999"

10 Daniel Perez Liston and Lawrence McNeil-Prairie View A&M University (2013) "The impact of trade finance on international trade: Does financial development matter?" Research in Business and Economics Journal -2013

11 GEORGE, G. and BOCK, A.J., (2011) The Business Model in Practice and its Implications for Entrepreneurship Research. Entrepreneurship Theory and Practice, 35(1), pp. 83.

12 Gaurav Shard and Namratha Swamy 2014 "Impact of Foreign Banks on the Indian Economy" IIM Bangalore WORKING PAPER NO: 451

13 Joydeep Bhattachrya (1994) “The Role of Foreign Banks in Developing Countries: A Survey of the Evidence” Department of Economics, IOWA State University USA.
14 Kavaljit Singh (2006) “Entry of Foreign Banks in India and China: A Brief Note: was prepared by the author in March 2006 for discussion among activists and campaigners associated with BankTrack.
15 Liston and Prairie (2013) “The impact of trade finance on international trade: Does financial development matter?” Research in Business and Economics Journal -2013
16 Mandira Sarma and Anjali Prashad (2014) “Do Foreign Banks in India Indulge in Cream Skimming?” Paper presented at the Annual International Studies Convention, Jawaharlal Nehru University, and New Delhi. 10–12 December
17 Osterwalder A., Pigneur Y. et al. (2005) “Clarifying Business Models: Origins, Present, and Future of the Concept”. Communications of the Association for Information Systems, 16, pp.
18 Osterwalder A. and Y. Pigneur Y. (2010) “Business model generation.” Wiley - LA English.
19 Pinches GE et al. (1973) , Mingo KA, Caruthers JK (1973) The stability of financial patterns in industrial organizations. J Finance 28(3):389–396
20 Pedrotti (2014) A Model for the Interest Margin of a Risk-neutral Bank. The Role of the Bank Orientation, Journal of Entrepreneurial and Organizatinal Diversity , Publication date: 17 June 2014 | Vol.3, Issue 1 (2014) 167-180
21 Zott, C. and Amit, R., 2007. Business Model Design and the Performance of Entrepreneurial Firms. Organization Science, 18(2), pp. 181.

Annexure 1:-Performance of Selected FFIs (which are operating consistently as per profile of banks RBI during 2003-2013 (Values in INR Million))

Case No	Name of FFI	Business	Advances	Investment
1	AB Bank Limited	689.20	374.33	127.86
2	Abu Dhabi Commercial Bank Limited	7597.23	2021.00	4178.72
3	Antwerp Diamond Bank N.V.	5592.99	5399.19	1603.60
4	Bank of America NA	81790.70	42689.60	43381.06
5	Bank of Bahrain and Kuwait B.S.C.	8109.92	3580.48	2139.22
6	Bank of Ceylon	1717.35	586.24	408.86
7	Barclays Bank PLC	71792.28	51374.34	62156.03
8	BNP Paribas	71871.31	37821.67	26126.57
9	CTBC Bank Co.,Ltd.	2651.91	1637.60	401.47
10	Citibank N.A.	757288.94	345373.51	230106.83
11	DBS Bank Ltd.	70173.18	46119.61	67793.86
12	Deutsche Bank AG	243959.31	92063.16	69540.06
13	JPMorgan Chase Bank	35019.65	17135.28	70139.71
14	Krung Thai Bank Public Company Ltd.	917.28	114.91	282.61
15	Mashreq bank psc	618.35	355.27	739.81
16	Mizuho Bank Ltd.	19109.32	16092.98	3969.87
17	Shinhan Bank	8699.00	4332.52	1887.69
18	Societe Generale	15232.36	5664.84	14498.80
19	Sonali Bank Ltd.	353.18	89.93	56.04
20	Standard Chartered Bank	758245.01	369421.38	170748.12
21	State Bank of Mauritius Ltd.	7215.56	3994.01	2201.44
22	The Bank of Nova Scotia	66185.25	44802.37	19798.60
23	The Bank of Tokyo-Mitsubishi UFJ, Ltd.	42134.03	30815.38	13493.78
24	The Hong-Kong and Shanghai Banking Corpn.Ltd.	651544.67	241832.05	260351.51

Source: - https://www.rbi.org.in/Scripts/Publications.aspx?publication=Annual

Annexure 1 indicates that there are 24 number FFIs operating in India consistently during the period 2003-04 to 2012-13, i.e. there is no break in allocation of advances, investment or their business. Also there is substantial increase in their business, advances and investment during this period.

Annexure 2:-List of Variables and Factor/Component Score Coefficient Matrix

	F-1	F-2	F-3	F-4	F-5	F-6	F7	-F-8
M-EXDEM	0.079	0.003	-0.073	0.045	-0.044	-0.091	-0.1	-0.091
log(M-FT)	-0.001	-0.061	-0.05	0.079	-0.019	-0.133	-0.184	-0.268
log(CTGDP)	0	0.035	0.045	-0.075	0.011	0.138	0.169	0.31
FIN	0.037	0.59	0.091	0.051	-0.075	-0.188	0.096	-0.706
EIR	0.051	0.147	0.023	0.806	-0.307	-0.028	-0.003	0.346
Advances	0.06	-0.037	-0.039	-0.025	0.054	0.017	-0.005	-0.038
Interest Income	0.066	0.005	-0.017	0.024	-0.011	-0.028	-0.021	-0.03
Net Profit	0.074	0.011	-0.091	0.002	-0.008	-0.048	-0.122	-0.108
Net Worth	0.05	0.027	0.055	0.036	0.001	0	0.023	0.151
Deposits	0.072	0.009	-0.039	0.038	-0.047	-0.05	-0.066	-0.057
Investments	0.069	0.111	0.03	0.115	-0.155	-0.116	-0.068	0.045
Other Income	0.061	-0.007	-0.008	0.013	0.008	-0.005	-0.03	0.009
Total Income	0.065	0.002	-0.015	0.021	-0.006	-0.023	-0.024	-0.02
Interest Expended	0.067	0.022	-0.007	0.017	-0.004	-0.026	0.021	-0.085
Operating Expenses	0.057	-0.023	0.022	0.028	0	0.005	0.011	0.059
Total Expenses	0.062	-0.002	0.007	0.022	-0.002	-0.008	0.014	-0.015
Cost of Funds	-0.025	0.002	0.104	0.006	0.223	0.073	0.982	-0.035
Return on Advances	-0.036	-0.152	0.437	0.051	0.127	0.001	0.224	0.746
Return on Assets	-0.011	0.007	-0.074	-0.194	0.961	0.071	0.215	0.083
CRAR	0.003	-0.139	-0.122	0.248	0.21	0.138	-0.038	-0.091
Net NPA	0.045	0.228	-0.104	-0.015	-0.124	-1.044	-0.11	0.181
Total Assets	6.10E-02	0.002	-0.008	0.026	0.008	-0.03	-0.024	0.05
Operating Profit	7.10E-02	2.00E-02	-0.045	0.032	-0.033	-0.055	-0.085	-0.029
Profit per Employee	-1.00E-02	3.71E-01	-0.02	0.12	0.131	-0.197	-0.066	0.511
Business per Employee	-2.20E-02	-2.00E-02	-0.336	-0.065	-0.136	0.013	-0.31	0.489
No. of Employees	6.70E-02	-2.70E-02	-0.003	-0.019	0.025	0.041	0.03	-0.213
No. of Offices	6.30E-02	-5.10E-02	-0.028	-0.088	0.118	0.101	0.095	-0.361
Wages as % of TE	-3.10E-02	1.38E-01	0.565	-0.076	-0.267	0.136	-0.118	-0.219

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization Component Scores.

Annexure 3:- Mean or average values of variables for a period 2003-04 to 2012-13.

	1	2	3	4	5	6	7	8	9
Case							Interest	Net	Net
No.	MEXDEM	log(MFT)	log(CTGDF	FIN	EIR	Advances	Income	Profit	Worth
1	0.011302	8.520946	0.716171	0.728676	11.7043	0.075151	43.8134	47.93819	531.5655
2	1.993978	6.274364	4.005062	0.81605	29.5134	0.405733	596.4668	144.6181	1433.942
3	2.044258	6.263548	3.882866	1.252066	6.986132	1.083933	377.1952	86.5328	1819.67
4	437.2524	3.933352	7.378122	1.052328	14.47222	8.570286	6178.131	3443.636	25838.4
5	1.808457	6.316776	3.991011	0.705273	13.39842	0.718812	479.7283	111.3826	1295.653
6	0.056594	7.821317	1.812312	0.579443	22.19721	0.117693	130.1293	85.73568	876.3367
7	753.9447	3.696745	7.558103	1.581373	17.64512	10.31382	9065.067	-439.026	35880.32
8	233.3098	4.206151	7.049174	0.88976	12.99163	7.593009	4913.651	1366.48	13033.78
9	0.155231	7.383107	2.439222	0.768909	11.47449	0.328762	187.9065	13.712	910.3369
10	18764.13	2.300756	9.977276	0.759922	15.56539	69.33656	53758.74	16679.69	99661.99
11	738.2202	3.705898	7.539043	1.623319	18.09345	9.258889	8344.631	2310.356	13996.96
12	1511.579	3.394653	8.391434	0.662419	15.37398	18.48243	14153.77	5001.229	39262.5
13	283.7692	4.121119	6.821963	2.492172	31.29069	3.440048	5361.748	3264.549	24558.35
14	0.007668	8.6894	0.671873	0.433381	71.51781	0.02307	82.1844	21.0976	443.5653
15	0.062057	7.781292	1.408714	1.77097	36.58039	0.071324	129.9595	82.2996	839.7577
16	15.08425	5.39556	5.284455	1.049899	7.917961	3.230798	1274.236	594.851	13221.21
17	1.931007	6.2883	4.049939	0.71505	15.82302	0.869791	685.5371	213.9429	2814.713
18	19.39233	5.286454	5.295083	1.323737	25.75065	1.137264	1458.734	298.1882	4359.767
19	0.00119	9.498512	-0.55174	0.413322	15.96035	0.018055	14.3541	9.499031	62.4212
20	14893.19	2.401096	9.877483	0.712394	13.99471	74.16436	51699.46	18836.64	92940.9
21	2.075999	6.256857	4.000183	0.858625	14.86414	0.801832	593.6765	85.40633	2273.813
22	209.4332	4.253039	6.966492	0.976063	8.902914	8.994443	3988.717	1584.072	8600.663
23	98.17731	4.582073	6.44133	1.051624	9.293006	6.18644	2863.675	1060.98	16126.01
24	14865.65	2.4019	9.810814	0.770758	18.13555	48.54976	43857.57	12919.08	92001.51

Annexure 3 continued: - Mean or average values of variables for a period 2003-04 to 2012-13.

	10	11	12	13	14	15	16	17	18
									Return
Case			Other	Total	Interest	Operating	Total	Cost of	on
No.	Deposits	Investmer	Income	Income	Expended	Expenses	Expenses	Funds	Advances
1	417.1836	0.100436	94.0111	137.8245	5.2742	51.8309	57.1051	1.592846	6.354355
2	7750.156	3.282207	123.4759	668.2895	619.1629	200.8647	498.5562	5.725984	3.230653
3	629.8798	1.25956	108.4462	483.2839	162.062	96.7826	271.1048	2.224303	2.892833
4	41952.85	34.07395	3427.549	9605.212	2302.402	2203.741	4506.562	3.166396	4.490603
5	4782.346	1.680269	90.7858	569.6926	256.1434	149.5937	405.7836	4.464146	4.70348
6	951.2952	0.321147	57.6074	188.2314	42.8481	33.923	76.22146	4.18408	6.647047
7	45184.81	48.82088	2625.642	11689.79	4546.924	4413.386	8796.007	5.193408	9.205074
8	35091.98	20.52129	1626.03	5986.015	2189.788	2063.796	4247.156	5.077408	3.329056
9	995.5634	0.315342	29.0727	216.229	64.6503	89.2132	157.1371	4.340328	4.737434
10	447915.7	180.739	17177.3	70935.49	19982.92	21144.78	41128.27	3.317731	6.873367
11	59807.56	53.24915	1044.025	9388.656	4701.185	1731.285	6432.47	4.594502	2.830329
12	112327.7	54.62072	7744.555	21899.64	4553.562	8116.914	12665.88	3.233051	5.90056
13	43242.6	55.09172	2836.417	8204.067	2252.027	1219.237	3470.678	2.615328	2.294875
14	866.9246	0.221984	14.1611	96.314	28.7083	30.9674	59.3	3.157066	5.266961
15	955.5095	0.581091	114.1018	241.6044	70.6079	69.2621	137.5054	3.384267	3.34988
16	6288.849	3.118168	396.0624	1670.584	296.2555	348.1234	644.0441	3.490809	3.855291
17	5578.31	1.482705	93.8473	782.2434	278.2324	134.0562	412.228	3.425068	4.943309
18	9648.415	11.38818	271.6336	1730.336	851.7249	482.903	1334.35	4.239087	3.906913
19	294.5599	0.04402	48.3475	63.14486	9.0565	37.0362	45.39638	1.885575	8.149363
20	416442.7	134.1153	20082.57	71852.82	21533.57	19433.5	40966.16	3.978731	6.48731
21	3641.168	1.729137	75.862	670.1248	381.7894	83.5198	465.6713	7.224513	2.021624
22	32306.82	15.55095	1274.11	5262.895	2393.521	500.8424	2894.537	4.258191	2.034303
23	17542.37	10.59878	820.067	3683.498	1019.768	648.711	1668.142	2.739569	4.286336
24	413797.1	204.4949	16027.52	59885.22	17376.18	17294.64	34671.82	3.711139	6.287041

Annexure 3 continued: - Mean or average values of variables for a period 2003-04 to 2012-13.

	19	20	21	22	23	24	25	26	27	28
	Return					Profit	Business			Wages
Case	on			Total	Operating	Per	Per	No.of	No.of	as a
No.	Assets	CRAR	Net NPA	Assets	Profit	Employee	Employee	Employee	Offices	% of TE
1	4.704	61.474	3.313	1004.768	82.4107	1.576	24.7026	27.9	1	18.07216
2	1.039	43.026	5.98	10274.44	169.7357	1.09029	168.4531	45.1	2	12.11498
3	0.89	36.901	2.267	9474.317	257.1901	3.2758	256.5594	21.8	1	18.36223
4	2.797	18.058	0	148290.5	6094.65	9.1727	263.7559	310.1	5	25.01976
5	0.658	24.114	3.439	8819.033	192.91	0.41	89.12	91	2	16.09609
6	2.927	57.625	7.832	2316.229	131.009	2.2425	58.0186	29.6	1	14.29878
7	1.901	19.875	1.481	240573.3	3527.787	6.6371	101.7176	705.8	5	31.57544
8	1.26	13.386	0.093	121104	2951.904	3.02	216.5451	331.9	9.1	21.58325
9	-0.392	37.548	2.926	3049.052	59.0937	-0.3512	94.7111	28	1.1	19.39872
10	2.479	13.689	1.395	1138294	37331.23	3.0513	174.6354	4336.4	39.3	16.20449
11	1.012	24.428	0.488	180835.9	5230.27	3.0249	192.6776	364.2	6.4	17.18687
12	1.871	14.251	0.235	302167	10628.74	3.7534	164.8151	1480.2	11	26.88934
13	2.706	20.401	0.844	167094.7	6107.39	13.7328	219.0097	159.9	1	24.44333
14	1.788	91.214	0	1815.272	39.0304	1.9135	89.0565	10.3	1	13.40693
15	4.535	72.071	0	4663.985	120.098	5.3007	45.8039	13.5	1.7	26.32301
16	2.227	46.5	0.25	113444.4	1131.529	3.9013	170.619	112	1.7	23.23686
17	1.962	53.25	0.08	15428.12	411.0154	3.8496	183.9114	47.3	2	13.89535
18	1.276	32.079	0.137	27607.41	485.9805	2.5831	158.3406	96.2	2.1	19.39847
19	2.18	46.447	4.579	476.9954	17.72746	0.2133	9.5456	37	1.7	48.85536
20	2.465	11.219	1.105	1068690	35833.66	2.1989	107.8953	7027.6	89.2	19.22794
21	1.166	39.378	1.988	10555.3	195.3515	2.1	211.6	34.1	3	6.989311
22	1.609	15.07	1.36	97942.94	2747.365	6.5996	343.2845	192.8	5	7.167538
23	2.118	40.831	0.011	83137.66	2212.355	4.3942	229.4882	183.6	3.1	22.46892
24	1.512	14.534	0.838	983194.3	31246.38	1.8522	115.0895	5661.2	46	20.26016

Annexure-4 Case wise calculations of values of 8 number factors:-

Case No	Factor-1	Factor-2	Factor-3	Factor-4	Factor-5	Factor-6	Factor-7	Factor-8
1	153.19	16.65	-8.74	93.12	-7.61	-55.33	-66.94	101.85
2	1454.31	144.33	-397.18	698.33	-323.27	-758.98	-816.36	267.57
3	831.00	80.16	-110.63	373.25	-0.37	-353.76	-354.63	781.64
4	15896.68	1546.18	-2306.81	7191.02	-1152.21	-7557.46	-7119.14	7919.86
5	1098.70	106.91	-239.53	514.67	-181.21	-549.23	-564.50	327.67
6	304.73	43.83	-41.68	170.63	-34.55	-135.81	-143.32	197.56
7	22665.80	1947.68	-2124.05	10303.29	-492.44	-10379.32	-8549.24	13907.07
8	12253.56	1000.25	-2081.33	5505.55	-903.19	-5976.61	-5587.55	5420.26
9	355.66	46.53	-44.35	179.31	-39.49	-151.50	-158.28	255.81
10	126632.37	10035.12	-27215.16	57051.91	-14982.28	-64862.55	-63737.27	37029.63
11	18696.81	1514.12	-3803.40	8369.58	-1761.95	-9471.92	-9043.40	6467.22
12	34207.79	2868.54	-6118.46	15419.74	-3535.42	-16685.74	-16132.75	12517.40
13	16735.02	1598.96	-2524.03	7591.41	-1043.39	-8108.74	-7602.53	8649.79
14	221.58	35.98	-59.45	178.26	-43.80	-93.66	-128.57	156.14
15	459.39	58.67	-53.35	250.24	-16.73	-198.37	-199.72	303.22
16	8459.65	682.52	-619.74	3805.72	544.05	-3881.18	-3113.49	7185.68
17	1681.87	183.83	-302.51	792.36	-181.97	-809.67	-812.95	867.27
18	3051.33	301.78	-489.79	1407.18	-299.84	-1452.44	-1363.34	1360.89
19	70.58	24.77	7.55	50.89	-16.47	-24.49	-41.60	5.31
20	119813.61	9394.47	-25687.02	53510.27	-13749.33	-60785.38	-59833.64	33710.03
21	1185.04	144.00	-206.89	556.66	-126.80	-551.09	-543.83	680.11
22	10117.42	861.34	-2107.76	4511.42	-957.88	-5106.27	-4983.96	3782.22
23	8078.86	849.32	-824.54	3713.54	-305.75	-3738.27	-3297.83	5249.35
24	111166.68	8997.00	-23912.35	50273.86	-13996.49	-56938.44	-56198.36	31281.90