Perspectives of Foreign Trade subjected to financing by Foreign Financial Institutions (FFIs) using business practices models as derived by factor and cluster analysis Post RBI Road Map 2005.

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This research paper is a part of the research work which is submitted to Shivaji University, Kolhapur, India for the degree of Doctor of Philosophy in the subject Business Economics, under the Faculty of Commerce by Researcher Ashok V.Edurkar-B. Tech (Chemical Engg.), MBA under the guidance of Dr. Dattatrya G.Chougule, M.A. M.Phil. Ph.D. Associate Professor & HOD, The New College, Shivaji University, Kolhapur.
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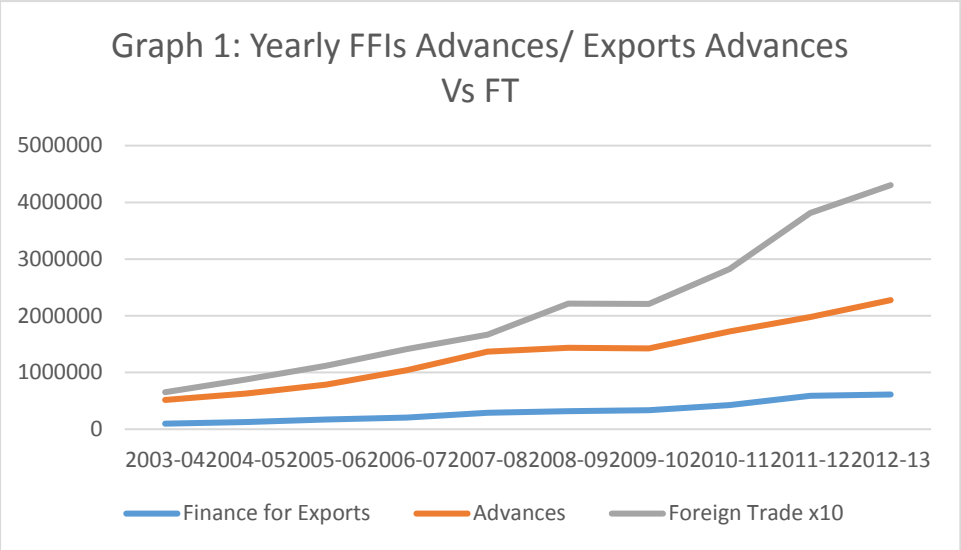
Perspectives of Foreign Trade subjected to financing by Foreign Financial Institutions (FFIs) using business practices models as derived by factor and cluster analysis Post RBI Road Map 2005.

Abstract: - With a reference to India's foreign trade, the aim of this paper is to assess business practices models of 24 Foreign Financial Institutions (FFIs) operating in India post RBI Road Map 2005 and during the period 2003 to 2013. Business practices models have been evaluated by the application of factor analysis followed by cluster analysis. 23 variables related to working of foreign financial institutions supported with 5 variables related to India's foreign trade, total 28 variables which were reduced into eight factors by using factor analysis. Using these eight factors, cluster analysis was carried out to group 24 foreign financial institutions into 3 clusters leading to three distinct business practices models which are applied by FFIs for financing of domestic as well as foreign trade . 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 FFIs. This paper also aims to take a review of FFIs operating in India based on two major hypothesis. For this research study, 24 FFIs operating in India consistently (as per "Profile of Banks" published by RBI), out of the universe consisting of 43 FFIs in India during year 2003-13, are considered.

Key Words: - Business Practices, Foreign Financial Institutions, Foreign Banks, Finance.

1Foreign Financial Institutions (FFIs) and Foreign Trade (FT): -

As per section 147(d)(5)- Hiring Incentives to Restore Employment Act (HIRE) of US government, the meaning of a FFI includes a legal entity having origin in a foreign country that collects deposits while carrying out banking or equivalent business; takes charge of assets of its clients which are financial in principle as a principal part of its business; is involved in principle in carrying out business of investing, reinvesting or marketing of securities and commodities covering various types of contracts like forward or option contract. This is a very broad definition. However, this paper covers only FFIs in the form of foreign entity, providing term loans and cash credit facility while operating in India during year 2003-13, are considered. Possibility of creation of surplus in local financial market, presence of positive environment for entering in local business, availability of effective system for the solution of issues related business information have been the principal leading factors for pushing FFIs entry across various business sectors in India. It is observed that FFIs presence does not endanger but rather enhances financial sector stability. Foreign Trade (FT) in the modern economy is a complex system of value creation and transformation, wherein Foreign Trade policies of various countries, Foreign Trade players and Foreign Financial Institutions (FFIs) play significant role.



The financial markets of various countries and FFIs project it to new heights of efficiency and funding accessibility for further value creation. Foreign Trade is to benefit from FFIs financial system implications, however, at the same time; it became dependent on it, on account of FFIs' market oriented credit policies. FFIs are efficient today and their Return on Assets has clearly shown a positive trend bringing into forefront the improvements brought across by the operational improvements through better practices (Gaurav Shard, Namratha Swamy 2014). Graph 1 indicates that there is an increase in foreign trade with increase in advances given by FFIs.

2 Hypothesis and Testing of Hypothesis

During this research study, the following hypotheses are formulated keeping in view India's foreign trade, domestic trade and financing by foreign financial institutions:-

2.1 FFIs' models generally help in the growth of Foreign Trade of India.

2.2 FFIs apply models which have positive effect on industrialization efforts in India.

The above mentioned hypothesis are tested with the use of tables supported by appropriate graphs and relevant statistical test using appropriate statistical formulae deriving necessary statistic which is compared against critical value for right tailed test and for 5% level of significance at distribution of test statistic is N (0, 1) or using regression analysis confirming correlation between an independent variable(x) and a dependent variable(y) following an equation y= a + bx, which indicates that any increase in independent variable will result appropriate increase in dependent variable following above equation.

Statistical tests, tables and supporting graphs are prepared with the use of various variables like Foreign Trade (FT), Operating Expenses, Total Expenses, Advances, Investments, Cost of Funds, Return on Advances, Return on Assets and IIP.

For this research study, 24 FFIs studied during the period 2003-04 to 2012-13 and related data are collected for the above variables consisting of N=24 and 28 variables x 10 years =280 observations during the observation period.

Since the term model is a very generic term, here an implied meaning of model is considered while testing these hypothesis. It means that a good model or a well acceptable model has correlation with above mentioned variables and positive outcome of tests based on these variables supports our hypothesis. Since each & every model contributes to foreign trade, while testing the above mentioned hypothesis, neither Model A/B nor Model C is considered separately but an average of data pertaining to these models is used for computing statistical tests and various tables supported with appropriate graphs.

A) Regression Analysis using Least Square Estimation: - The simplest relationship between an independent variable x and a dependent variable y is a linear relationship which is given by x and y = a + bx. To obtain some reasonably good estimate of a and b, we use the method of least squares. It may be noted that the exact relationship between x and y is not linear, we are only approximating the relationship by a line. Therefore, it is not correct to write the line equation as y=a +bx. We write it as y bar= a +bx. Where, y bar is the predicted or fitted or estimated value of y. The exact relationship between x and y can be written as y= a + bx + error. This error is the difference between the observed value and the predicted value of y. Using collected observations (x1,y1), (x2,y2)…….(xn,yn), these errors or residuals can be written as (yi-a-bx) for i=1,2,…..n. We wish to have such values of a and b for which these residuals are minimum. In least square method, we minimize the summation of squared residuals. For this we differentiate $\sum_{n=1}^{\infty}(\text{yi} - \text{a} - \text{bxi})2$ with respect to a and b separately and equate the derivatives to zero. Solving those two equations we get following estimates of a and b: - a= y bar –b*x bar

$b = \sum_{i=0}^{n}(xi - x\ bar)(yi - ybar) / \sum_{i=1}^{n}(xi - x\ bar)2$

= SSXY / SSX. The values of a and b obtained using least squares method are called as least square estimates (LSE) of a and b. Also the relation between the correlation coefficient between x and y. (r) and LSE of b is given by r =$\sqrt{\text{SSX/SSY}}$ 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 as under:-

$\boldsymbol{Tc} = \frac{\boldsymbol{bbar}}{\sqrt{\boldsymbol{SSY}/(\boldsymbol{n-2})\boldsymbol{SSX}}}$ Value of 'R', 'R square' and 'Beta' are calculated using SPSS.

Where x bar =sample mean, σ= known population standard deviation, n= sample size. Distribution of this test statistic is N (0, 1). Hence critical value for right tailed test and for 5%

level of significance is 1.645. We have computed test statistic value using above equation and compared it against critical value for testing hypothesis.

Testing of Hypothesis 1: -

2.1 H1: FFIs' models generally help in the growth of Foreign Trade of India.

2.1.1 HO: FFIs' models generally do not help in the growth of Foreign Trade of India.

Statistical Test: -This hypothesis is tested using statistical test-regression analysis and table supported with graph by comparing ,A) FFIs' Advances - Independent Variable, B) Foreign Trade (FT) - Dependent Variable, Statistical Test using Regression Analysis: - y= a + bx , x = Advances, independent variable,y = FT-Average, dependent variable,

Table 1 FFIs' Advances and India's FT: -

Year	Advances	FT	xi-x bar	yi-y bar	SSX=(xi-x bar)^2	SSY=(yi-y bar)^2	(x-x bar)*(y-y bar)
03-04	515820	6524750	-801404	-14567171	6.42248E+11	2.12202E+14	1.16742E+13
04-05	626080	8764050	-691144	-12327871	4.7768E+11	1.51976E+14	8.52033E+12
05-06	785200	1116820	-532024	-9923651	2.8305E+11	9.84788E+13	5.27962E+12
06-07	1040891	1412280	-276333	-6969071	76359926889	4.8568E+13	1.92578E+12
07-08	1365475	1668170	48251	-4410161	2328159001	1.94495E+13	-2.12795E+11
2008-09	1435312	22151910	118088	1059989	13944775744	1.12358E+12	1.25172E+11
2009-10	1426562	22092700	109338	1000779	11954798244	1.00156E+12	1.09423E+11
2010-11	1721003	28263890	403779	7171969	1.63037E+11	5.14371E+13	2.89589E+12
2011-12	1979991	38114220	662767	17022299	4.3926E+11	2.89759E+14	1.12818E+13
2012-13	2275906	43034810	958682	21942889	9.19071E+11	4.8149E+14	2.10363E+13
	X bar= 1317224	Y bar= 21091921			SSX= 21091921	SSY= 1.35549E+15	SSXY= 6.26357E+13

b=SSXY/SSX =6.26357E+13/21091921=**2969653.641** and a= y bar –b * x bar =21091921 – (2969653.641*1317224)= **-3.91172E+12** . Value b =2969653.641 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:-

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

= 2969653.641 * (21091921/ 1.35549E+15) ^0.5= **370.4381514**

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

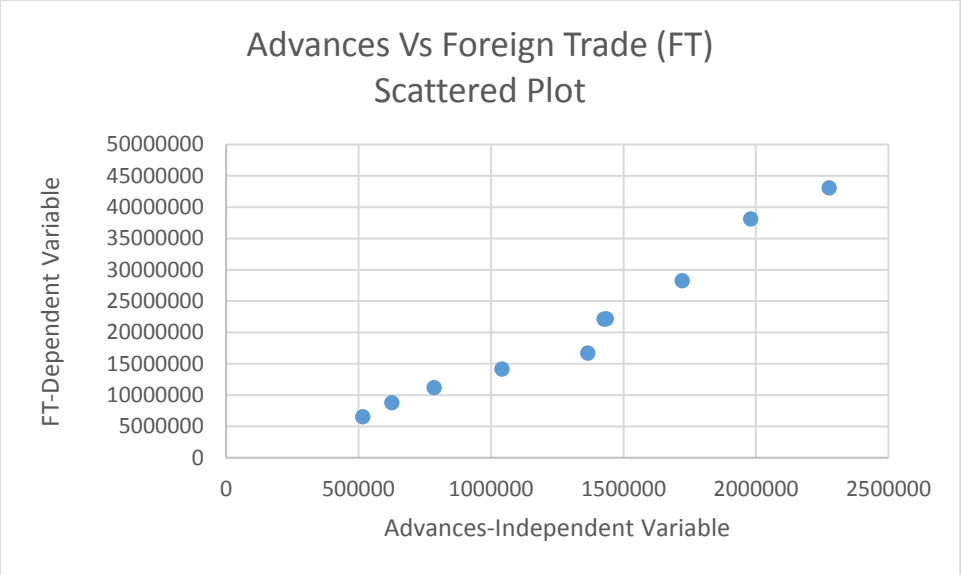
$$\boldsymbol{Tc = \frac{bbar}{\sqrt{SSY}/(n-2)SSX}}$$

= (2969653.641) / ((1.35549E+15)/((24-2)*(21091921)))^0.5

=1737.508944

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-Advances and the dependent variable-Foreign Trade (FT)

Graph 1 Advances Vs Foreign Trade (FT) –Scattered Plot



Using SPSS the calculated value of ‘R’ is 0.978 and ‘R square’ is 0.956. Also the calculated value of standardised coefficient ‘Beta’ is 0.978. Since these values are closer to 1, it is concluded that there exists linear correlation between independent variable ‘Advances’ 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 2 for Exports.

Year	Exports Advance	Foreign Trade	xi-x bar	yi-y bar	(xi-x bar)^2	(yi-y bar)^2	(x-x bar)*(y-y bar)
2003-04	97600	6524750	-218684	-14567171	47822691856	2.12202E+14	3.18561E+12
2004-05	123390	8764050	-192894	-12327871	37208095236	1.51976E+14	2.37797E+12
2005-06	173260	11168270	-143024	-9923651	20455864576	9.84788E+13	1.41932E+12
2006-07	207110	14122850	-109174	-6969071	11918962276	4.8568E+13	7.60841E+11
2007-08	289540	16681760	-26744	-4410161	715241536	1.94495E+13	1.17945E+11
2008-09	315110	22151910	-1174	1059989	1378276	1.12358E+12	-1244427086
2009-10	333960	22092700	17676	1000779	312440976	1.00156E+12	17689769604
2010-11	424870	28263890	108586	7171969	11790919396	5.14371E+13	7.78775E+11
2011-12	586000	38114220	269716	17022299	72746720656	2.89759E+14	4.59119E+12
2012-13	612000	43034810	295716	21942889	87447952656	4.8149E+14	6.48886E+12
	316284	21091921			SSX=	SSY=	SSXY=
					2.9042E+11	1.35549E+15	1.9737E+13

b=SSXY/SSX =19736957064360 /290420267440= **67.95998516** and a= y bar –b * x bar = 21091921- 67.95998516*316284= **-402734.9463** Value b = 67.95998516 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:-

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

= 67.95998516 * (2.9042E+11 /1.35549E+15)^0.5= **0.994760145**

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

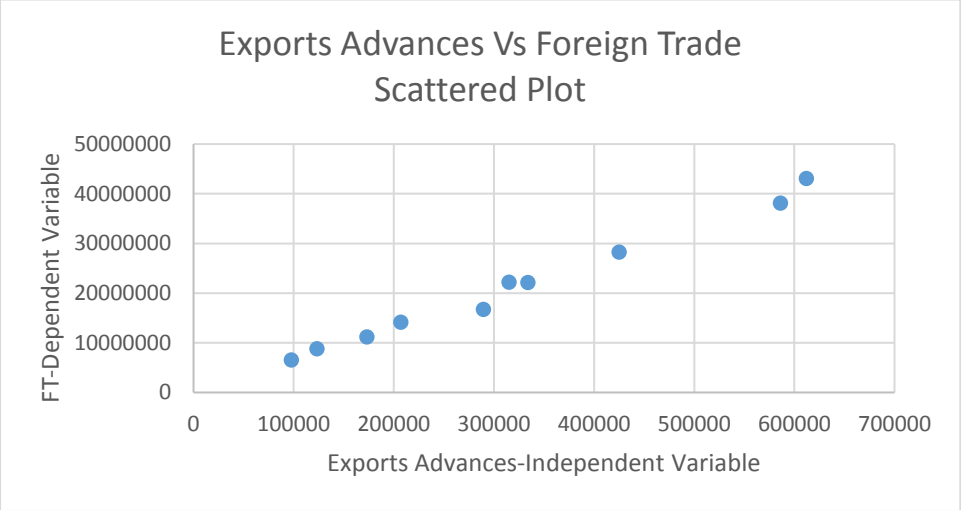
$$\boldsymbol{Tc = \frac{bbar}{\sqrt{SSY}/(n-2)SSX}}$$

= (67.95998516) / ((1.35549E+15)/((24-2)*(2.9042E+11)))^0.5

= **4.665838661**

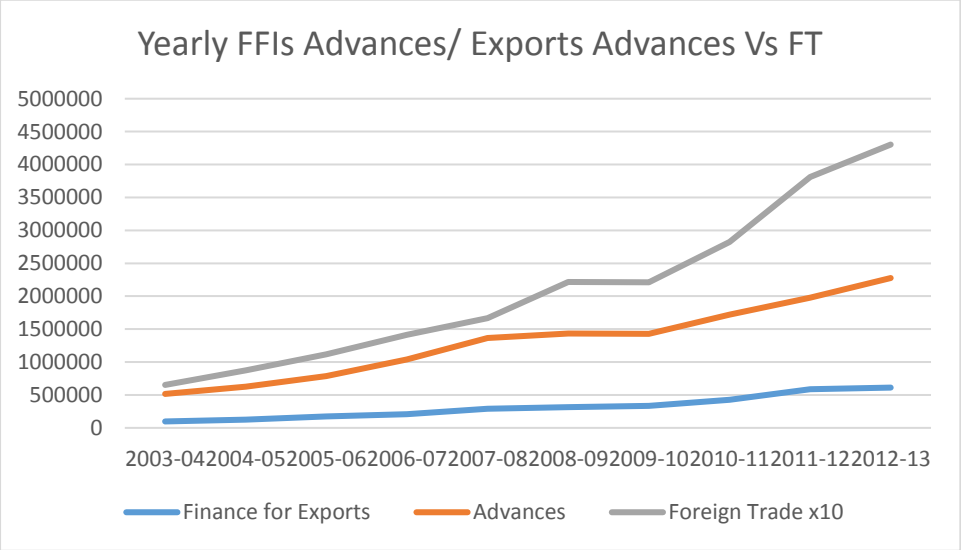
At 5% level of significance and 22 d.f., the critical value using t distribution is 2.074 which is smaller than the computed value. Therefore, at 5% level of significance we reject the null hypothesis and conclude that there is an evidence of linear relationship between the independent variable-Exports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

Graph 2 Exports Advances Vs Foreign Trade- Scattered Plot



Using SPSS the calculated value of 'R' is 0.995 and 'R square' is 0.988. Also the calculated value of standardized coefficient 'Beta' is 0.995. Since these values are closer to 1, it is concluded that there exists linear correlation between independent variable 'Export Advances' and dependent variable 'Foreign Trade'. This means that regression explains most of the variability in the dependent variable and the fitted model is good.

Graph 3 Yearly FFIs Advances/Exports Advances Vs FT



Help from FFIs model should result in growth. From tables and graphs it is observed that with an increase in advances given by FFIs there is an increase in foreign trade (FT). There is a liner relationship between the independent variable-advances and the dependent variable-foreign trade.

This follows the equation y=a +bx. The average growth of foreign trade is 23.26% during observation period. This is possible because of typical characteristics of all three models of FFIs, i.e. model-A, model-B, model-C. From above statistical tests, tables and graphs it is observed that with increase in FFIs' advances there is increase in foreign trade. Hence H1 is acceptable whereas HO is rejected and we conclude that FFIs' models generally help in the growth of Foreign Trade of India.

Testing of Hypothesis 2: -

2.2 H1: FFIs apply models have positive effect on industrialization efforts in India.

2.2.1 HO: FFIs apply models do not have positive effect on industrialization efforts in India.

This hypothesis tested using statistical test and tables supported with graphs by comparing

A) Advances- Independent Variable

B) Investments- Independent Variable

C) IIP- Dependent Variable against SBI since in India SBI is the lead financial institution for providing advances to manufacturing & trading.

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

x = Advances, independent variable

y = Index of Industrial Production (IIP)-Average, dependent variable

Table 3 FFIs' Advances and India's IIP

Year	Advances	IIP-Average	xi-x bar	yi-y bar	(xi-x bar)^2	(yi-y bar)^2	(x-x bar)*(y-y bar)
2003-04	515820	100	-801404	-63.2	6.42248E+11	3994.24	50648732.8
2004-05	626080	111	-691144	-52.2	4.7768E+11	2724.84	36077716.8
2005-06	785200	129	-532024	-34.2	2.8305E+11	1169.64	18195220.8
2006-07	1040891	158	-276333	-5.2	76359926889	27.04	1436931.6
2007-08	1365475	165	48251	1.8	2328159001	3.24	86851.8
2008-09	1435312	176	118088	12.8	13944775744	163.84	1511526.4
2009-10	1426562	195	109338	31.8	11954798244	1011.24	3476948.4
2010-11	1721003	198	403779	34.8	1.63037E+11	1211.04	14051509.2
2011-12	1979991	198	662767	34.8	4.3926E+11	1211.04	23064291.6
2012-13	2275906	202	958682	38.8	9.19071E+11	1505.44	37196861.6
	X bar= 1317224	Y bar= 163.2			SSX= 3.02893E+12	SSY= 13021.6	SSXY= 185746591

.b=SSXY/SSX =185746591/3.02893E+12=**6.13242E-05** and a= y bar –b * x bar = 163.2-6.13242E-05 * 1317224 = **82.42229198**. The value b =82.42229198 is the change in the value of Y for a unit change in the value of X. The intercept is a constant or thevalue 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:-

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

= b√((SSX)/SSY)

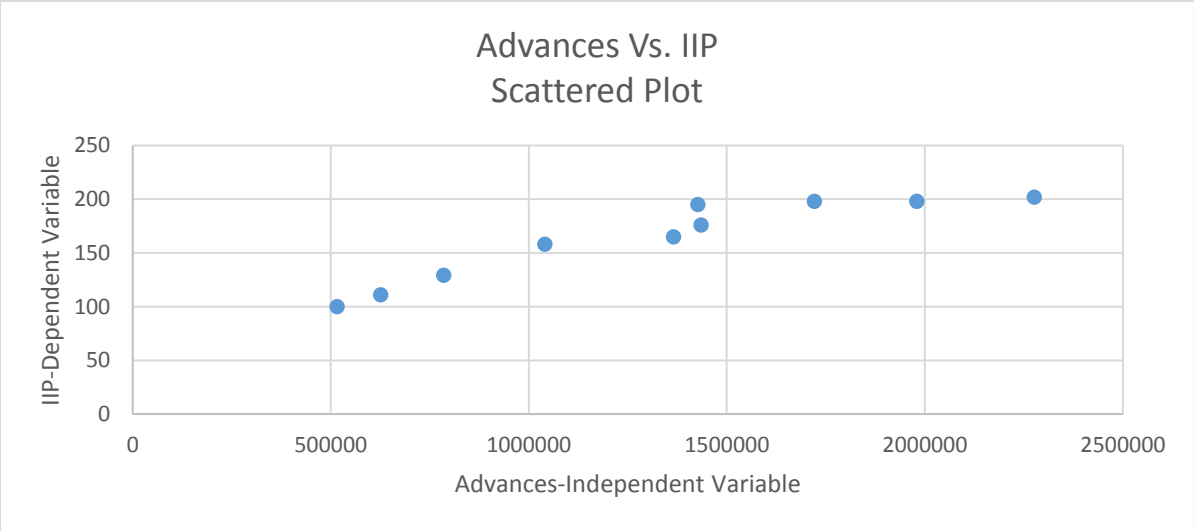
=82.42229198 * (3.02893E+12 /13021.6) ^0.5= **1257063.25**

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 $\boldsymbol{Tc} = \frac{bbar}{\sqrt{SSY}/(n-2)SSX}$ = (82.42229198) / ((13021.6)/((24-2)*(3.02893E+12)))^0.5

= **5896149.281**

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- Advances and the dependent variable-IIP

Graph 4 Advances Vs IIP- Scattered Plot



Using SPSS the calculated value of 'R' is 0.935 and 'R square' is 0.875. Also the calculated value of standardised coefficient 'Beta' is 0.935. Since these values are closer to 1, it is concluded that there exists linear correlation between independent variable 'Advances' and dependent variable 'IIP-Average'. This means that regression explains most of the variability in the dependent variable and the fitted model is good.

Table 4 FFIs' Investment and India's IIP: - -

Statistical Test using Regression Analysis: - y= a + bx x = Investments, independent variable
y = IIP-Average, dependent variable

Year	Investments (xi)	IIP-Average	xi-x bar	yi-y bar	(xi-x bar)^2	(yi-y bar)^2	(x-x bar)*(y-y bar)
2003-04	364610	100	-633691	-63.2	4.01564E+11	3994.24	40049271.2
2004-05	370980	111	-627321	-52.2	3.93532E+11	2724.84	32746156.2
2005-06	454500	129	-543801	-34.2	2.9572E+11	1169.64	18597994.2
2006-07	609524	158	-388777	-5.2	1.51148E+11	27.04	2021640.4
2007-08	810502	165	-187799	1.8	35268464401	3.24	-338038.2
2008-09	1073079	176	74778	12.8	5591749284	163.84	957158.4
2009-10	1358713	195	360412	31.8	1.29897E+11	1011.24	11461101.6
2010-11	1377481	198	379180	34.8	1.43777E+11	1211.04	13195464
2011-12	1670077	198	671776	34.8	4.51283E+11	1211.04	23377804.8
2012-13	1893544	202	895243	38.8	8.0146E+11	1505.44	34735428.4
	X bar= 998301	Y bar= 163.2			SSX= 2.80924E+12	SSY= 13021.6	SSXY= 176803981

b=SSXY/SSX =176803981/2.80924E+12= **6.29366E-05** and a= y bar –b * x bar = 163.2-6.29366E-05* 998301=**100.3703293**. The value b =6.29366E-05 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)

=6.29366E-05 * (2.80924E+12 /13021.6)^0.5= **0.924411893**

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

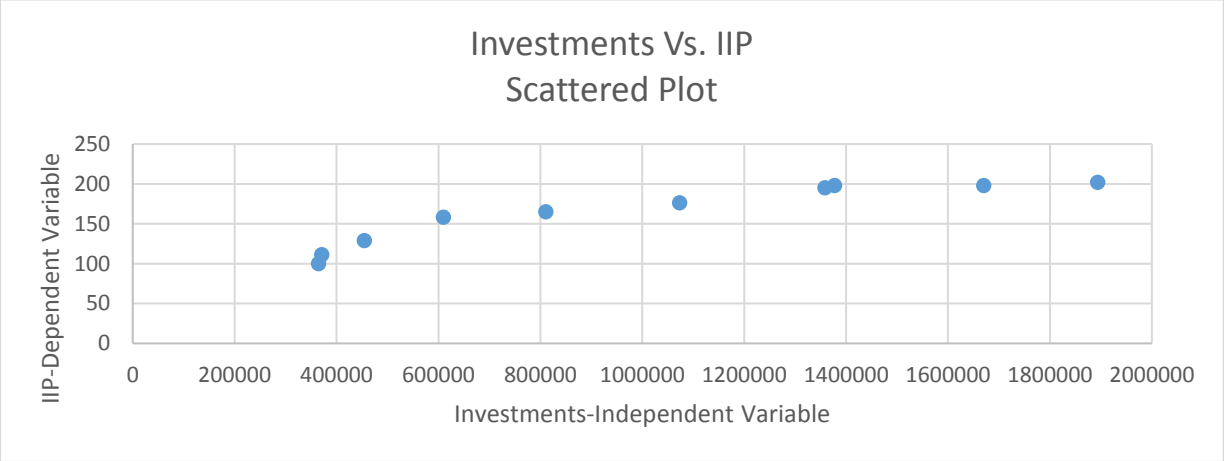
= (6.29366E-05) / ((13021.6)/((24-2)*(2.80924E+12)))^0.5

= **4.335876109**

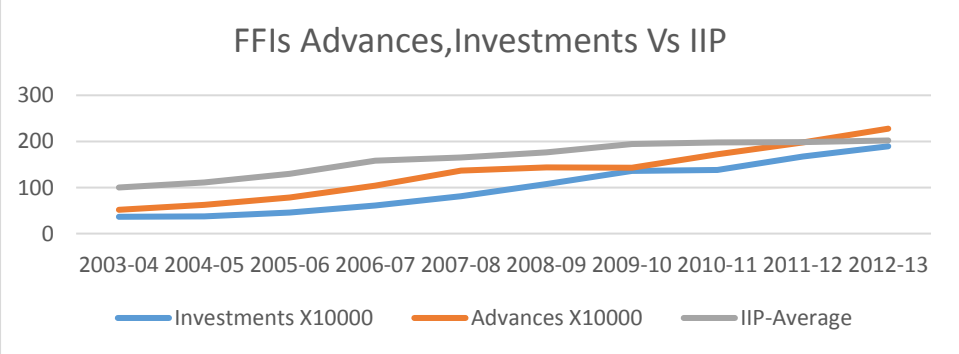
At 5% level of significance and 22 d.f., the critical value using t distribution is 2.074 which is smaller than the computed value. Therefore, at 5% level of significance we reject the null hypothesis and conclude that there is an evidence of linear relationship between the independent variable- Investments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

Using SPSS the calculated value of 'R' is 0.924 and 'R square' is 0.855. Also the calculated value of standardised coefficient 'Beta' is 0.924. Since these values are closer to 1, it is concluded that there exists linear correlation between independent variable 'Investments' and dependent variable 'IIP-Average' This means that regression explains most of the variability in the dependent variable and the fitted model is good.

Graph 5 Investments Vs IIP- Scattered Plot



Graph 6 FFIs' Advances, Investment and India's IIP



From the above statistical test, table and graph it is observed that IIP-Average increase with increase in FFIs' advances & investment. Hence H1 is acceptable whereas HO is rejected.

Based on tables, graphs and statistical tests using regression analysis it is concluded that all the four hypothesis are acceptable and factor analysis supported with cluster analysis is useful in generation of eight uncorrelated variables from 28 correlated variable using principal component analysis and create three cluster out of 24 cases related to foreign financial institutions.

3.1 Analysis and Interpretation of data for derivation of models:-

World over no FFI is confined to a specific theoretical business practices 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 FFIs operating in India, are not relying on any specific theoretical model but making use of best of all business opportunities available.

3.2 Profile of selected foreign banks for study purpose and variables

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

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

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

3.2.3 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 shows the Case wise calculations of values of 8 number factors.

3.3 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 FFIs, real imports contribution by FFIs , real gross

domestic product contribution by FFIs (CTGDP), Modified export demand (M-EXDEM) because of FFIs, 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 $exports$ (5.3.1)

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 (5.3.2)

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

Log ($imports$) = A0 +A1log (MGDP) +A2FIN (5.3.3)

Where imports, are real imports contribution by FFIs and M-GDP is the real gross domestic product contribution by FFIs. A0, A1, A2 are constants. From profile of FFIs it is observed that FFIs' 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 FFI's financing= (Total Imports/Total Exports)*(Investments by FFI)*(Advances by FFI) where, (FFI's Business) = ('No. of Employees* 'Business /Employee')

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

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

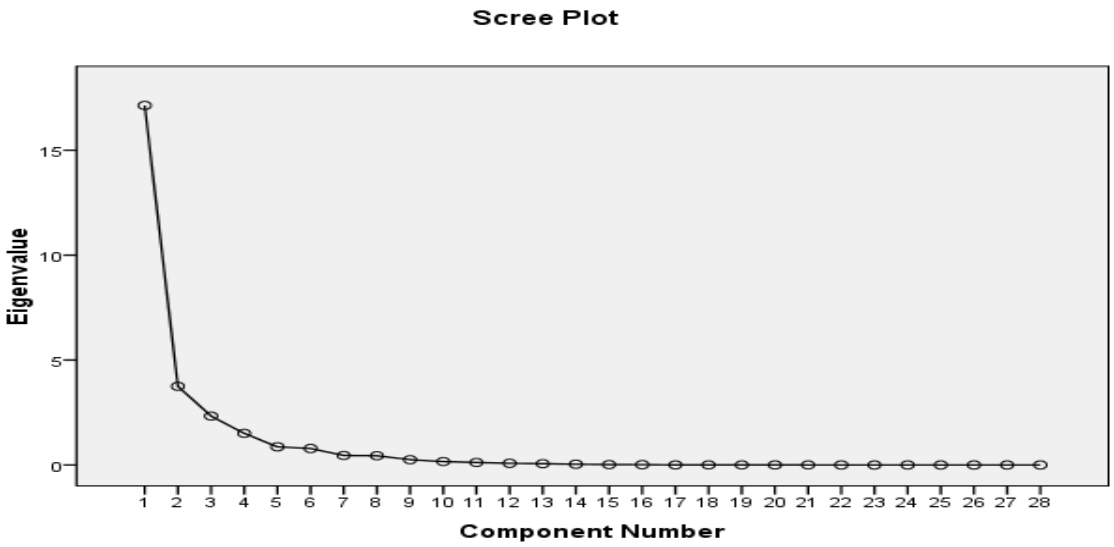
(D) Log (M-FT) =Log ((((Average FT)/ (Investments!*Advances!)))

(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.

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

Graph 3.4.1:- Scree plot graph:-



Graph 3.4.1 shows Eigen values. 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.

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

5.5.1 Case wise computation of values of 8 factors which are generated using factor analysis.

5.5.2 Case 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:-

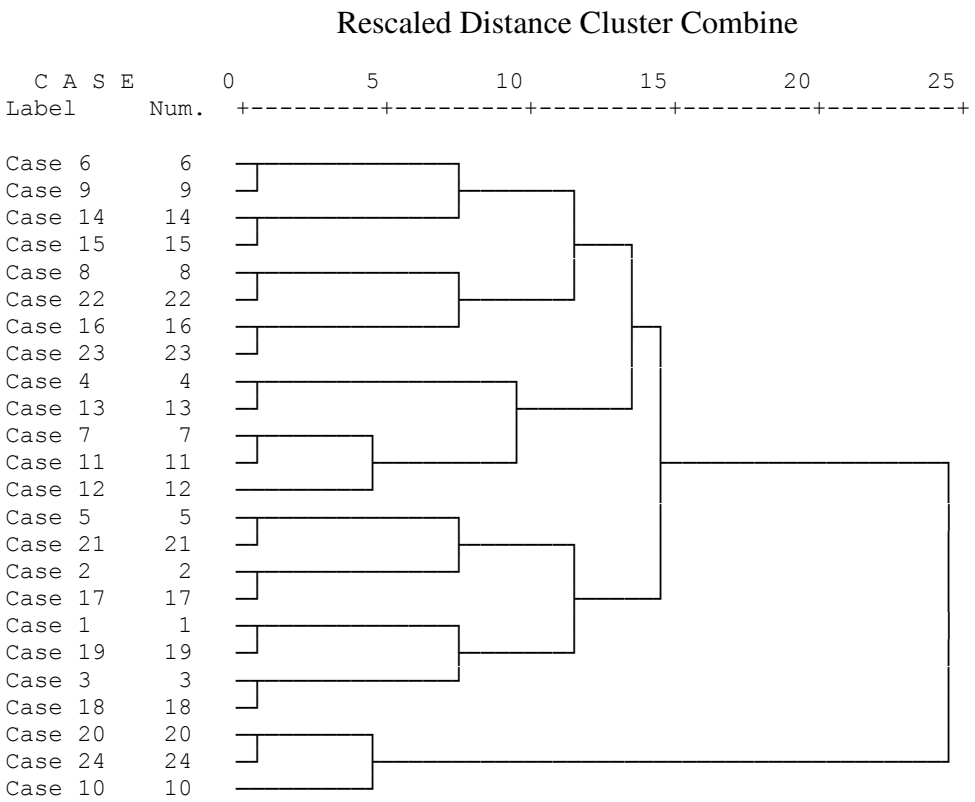
Table 3.5.2.1 Cluster Membership

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 3.5.2.1 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 3.5.1 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 3.5.1 Dendrogram using Centroid Method



3.6 Characteristics of FFIs'- 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.

3.6.1 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 FFIs.

Table 3.6.1 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

3.6.2 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 3.6.2 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

3.6.3 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 3.6.3 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

3.6.4 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 3.6.4 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

3.6.5 Model A: - This is basically cluster 1. It includes eight cases out of 24 cases. 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 FFIs, meaning FFIs covered under this model are just maintaining their existence by carrying out their operational activities while operating in India. These FFIs 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 3.6.5 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

3.6.6 Model B: - This is basically cluster 2. It includes thirteen cases out of 24 cases. 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 FFIs, meaning FFIs covered under this model are pushing their presence with initiative by carrying out their operational activities while operating in India.

Table 3.6.6 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

3.6.7 Model C: - This is basically cluster 3. It includes three cases out of 24 cases. Here, both absolute mean values and percentages mean values of eights factors are at the maximum or at

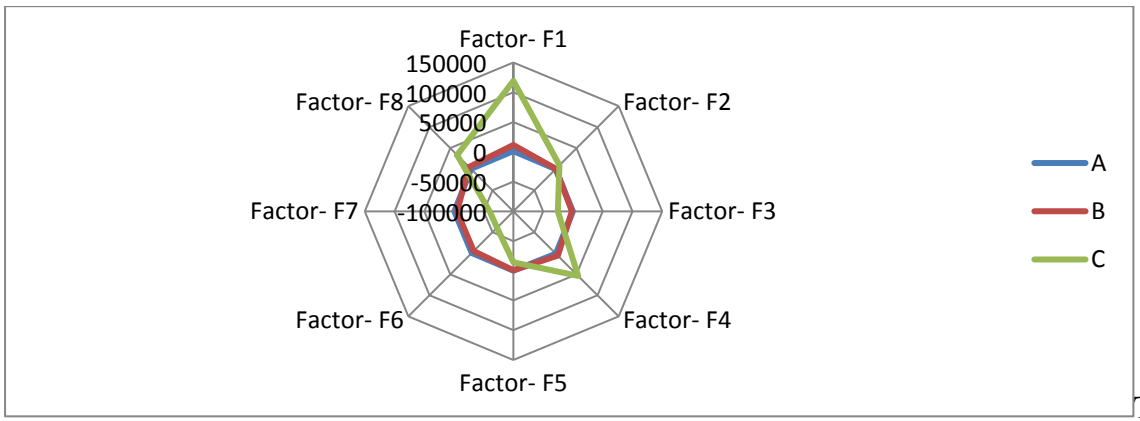
the highest level. Hence this model is termed as “High End Star model” of the FFIs, meaning FFIs covered under this model are leaving no chance for pushing their presence at the highest level by carrying out their operational activities while operating in India.

Table 3.6.7 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 3.6.7 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 3.6.7 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

3.6.7 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

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

3.8.1 Dependency: - The present study reveals that the three models of FFIs 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.

3.8.2 Enhancing probability of financing: - So to enhance the probability of the FFIs 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.

3.8.3 It is concluded that there is no authentic declaration of self – defined model by any FFIs operating in India.

3.8.4 Covering Basic Elements: - Although all 24 cases of FFIs 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 FFIs are grouped into three clusters possessing totally different values for all eight number factors as indicated by the graph.

3.8.5 Least & Medium Values:-We can very well conclude that 'Low End Also Ran 'Model-A possesses least values for eight factors indicating that these FFIs 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.

3.8.6 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.

3.8.7 Since, the contribution of FFIs 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.

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3.8.8 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 FFIs 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 FFIs maintain the proper balance in financial/foreign trade variables and able to minimize the financial burden on it, which directly enhances the profitability and FFIs' survival in stiff competition with grace. Thus, it is concluded that this research is helpful to the FFIs to become more competitive and compatible in the light of RBI's guidelines and roadmap for FFIs operating in India.

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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