

CHAPTER 4:

COST COMPONENTS AND ITS BEHAVIOURS

4.1 Introduction: The previous chapter deals with research methodology. This chapter presents the analysis of objective number one. The methodology adopted for the purpose has been described in *Chapter 3*. In order to investigate the major cost components and its behaviour over the years, we have analysed the cost structure of the industry and company, and identified the major cost components. Moreover, we have used ABJ regression model for cost behaviour observations. To assess the behaviour of cost, we have considered only main cost elements of the selected six industries. To investigate the main cost components of the selected companies and industries, we have calculated the proportion of each cost elements to total expenditure of that company. We have discussed the results in the following paragraphs.

4.2 Objective: To investigate the major cost components of the firms and its behavior over the years.

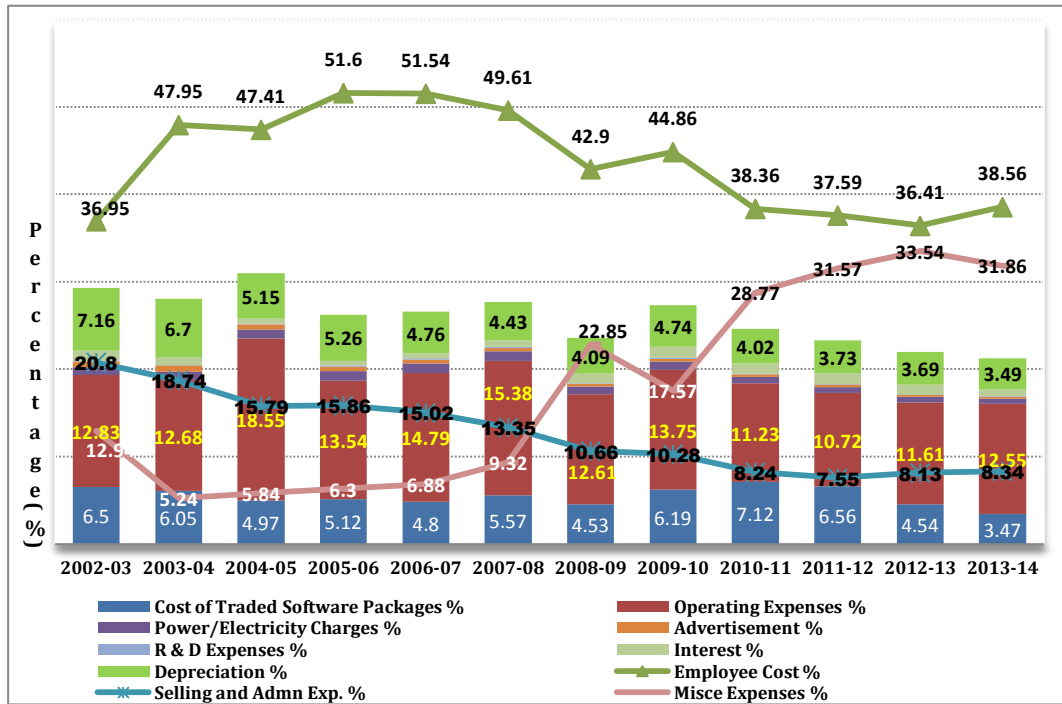
4.3 Methodology Applied: To investigate the cost components and behaviour of firms' cost over the years we have used a graphical representation of industries and company's cost structure and apply ABJ regression model for cost behaviour observations. We already discussed details about the methodology in *Chapter 3- Research Methodology*.

4.4 Analysis and Interpretation: Here, we have analysed the operational and financial cost related to six selected industries, i.e. IT-Software, Banking, Finance, Refineries, Power generation & distribution and Steel industry.

4.4.1 IT- Software Industry

Graphical representations of cost structure of IT-Software industry provides a visual display of major cost elements during the study periods starting from financial year end March 2003 to financial year end March 2014. The results are shown in *figure 4.1 and 4.2*.

FIGURE 4.1: COST STRUCTURE OF IT-SOFTWARE INDUSTRY FOR 12 YEARS.

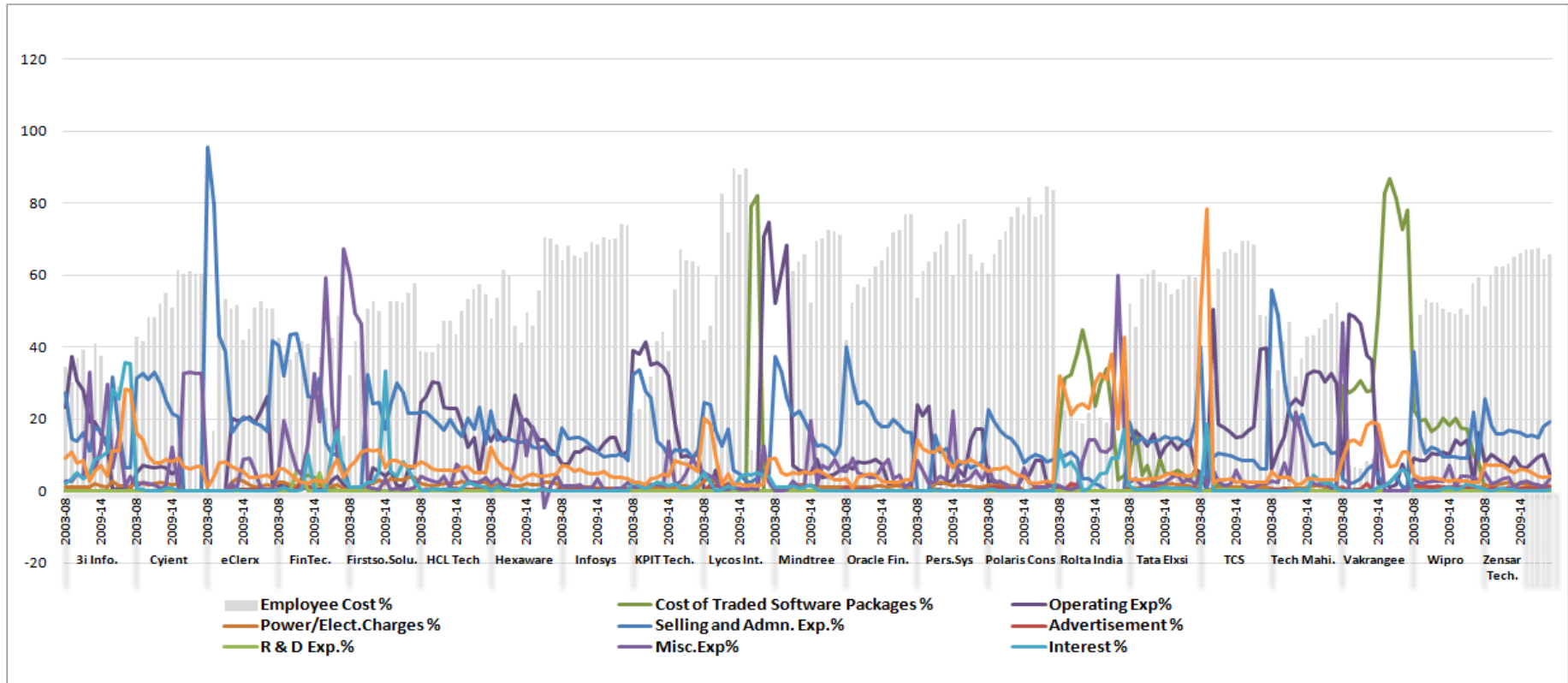


Source: Compiled and calculated by the researcher

Figure 4.1 shows overviews about the cost structure of the IT-Software industry. Employee cost (average 43% of total cost) is the main cost element of the Software industry both in pre (2003-08) and post-recession (2009-14) periods followed by Misc. expenses (avg.17%), Operating expenses (average 14%) and Selling & Administration expenses(avg.14%). On pre-recession periods, Employee cost was in increasing trend, i.e. vary from 37 % to 50% of the total cost incurred by the companies, and average spending for Employee cost more than 43.5% of the total cost. In the post-recession period all the companies in this industry have tried to control Employee Cost, Operating cost and Selling & Administration expenses. In post-recession periods Miscellaneous expenses are growing rapidly and became second major cost element after Employee cost, whereas Selling & Administrative cost are going down rapidly. In post-recession period they have also reduced R&D cost and Advertisement cost.

In figure 4.2 give us a result as per with industry outcomes, i.e. most of the selected companies' main cost element is Employee cost in pre and post-recession periods.

FIGURE 4.2: COST STRUCTURE OF SELECTED COMPANIES UNDER IT-SOFTWARE INDUSTRY, DURING PRE-RECESSION (2003-08) AND POST-RECESSION (2009-14) PERIODS



Source: Compiled and calculated by the researcher

In sample companies, Employee cost accounted as an average 65-70% of the total cost. Two companies, Vakrangee Software and Mindtree have different cost structure. In a case of Vakrangee Software, ‘Cost of traded software packages’ is the main cost element and Mindtree’s main cost element is ‘Operating expenses’ in pre-recession periods. In the post-recession period all the sample companies in this industry have tried to control major costs, i.e. Employee costs, Operating costs and Selling & administration expenses.

For applying ABJ regression model we have taken Employee cost, Operating expenses, Misc. expenses and Selling & Adm. expenses as they are the main cost elements in the IT-Software industry. *Table 4.1* below shows the result of ABJ regression model for IT-Software industry.

TABLE 4.1: RESULTS OF THE ABJ’s REGRESSION MODEL FOR VARIOUS COST CATEGORIES UNDER IT-SOFTWARE INDUSTRY

		Employee Cost	Operating Expenses	Misc. Expenses	Selling and Adm. Expenses
Coefficients Beta	β_0 (Intercept)	-0.004	-0.04	-0.059	-0.012
	β_1 (Direct Effect)	0.997 (.001)	1.323 (.011)	1.86 (.153)	.715 (.008)
	β_2 (Sticky Measure)	0	0	0	0
	Adjusted R Square	0.662	0.483	0.126	0.518
	F	20.589 (.001)	10.338 (.011)	2.437 (.153)	11.746 (.008)

Note: ‘Significant’ levels are shown in parenthesis.

Source: Compiled and calculated by the researcher

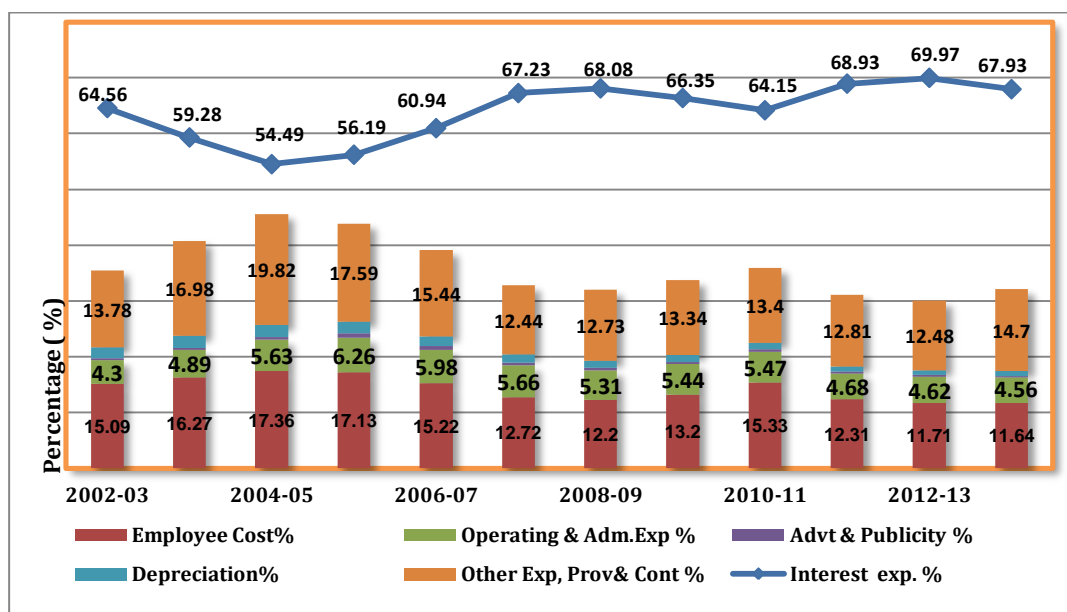
The results of the ABJ regression model with major cost components indicate that selected costs do not exhibit cost stickiness (*Table 4.1*). In the case of direct effect (β_1), the observed coefficients are the significant for all the cost components considered here except for Misc. expenses. This indicates that almost all the cost components have significant impact on the outcome variable. However, the coefficient of β_2 is found to be zero for all the cases. As per the interpretation of the ABJ regression model, we know that if the traditional fixed and variable-cost model is valid then the value of β_2 will be zero because the upward and downward changes in costs will be equal. Here, we find evidence of non-sticky cost behavior for the cost components of the Software industry. The observed R^2 value and significant F statistic advocate in favour of the appropriateness of the regression

model used in the present context for all the cases except two costs namely, Misc. expenses and Operating expenses.

4.4.2 Banking Industry

Graphical representations of the cost structure in Banking industry give us overviews of major cost elements during the study periods. The results are shown in figure 4.3 and 4.4.

FIGURE 4.3: COST STRUCTURE OF BANKING INDUSTRY FOR 12 YEARS.

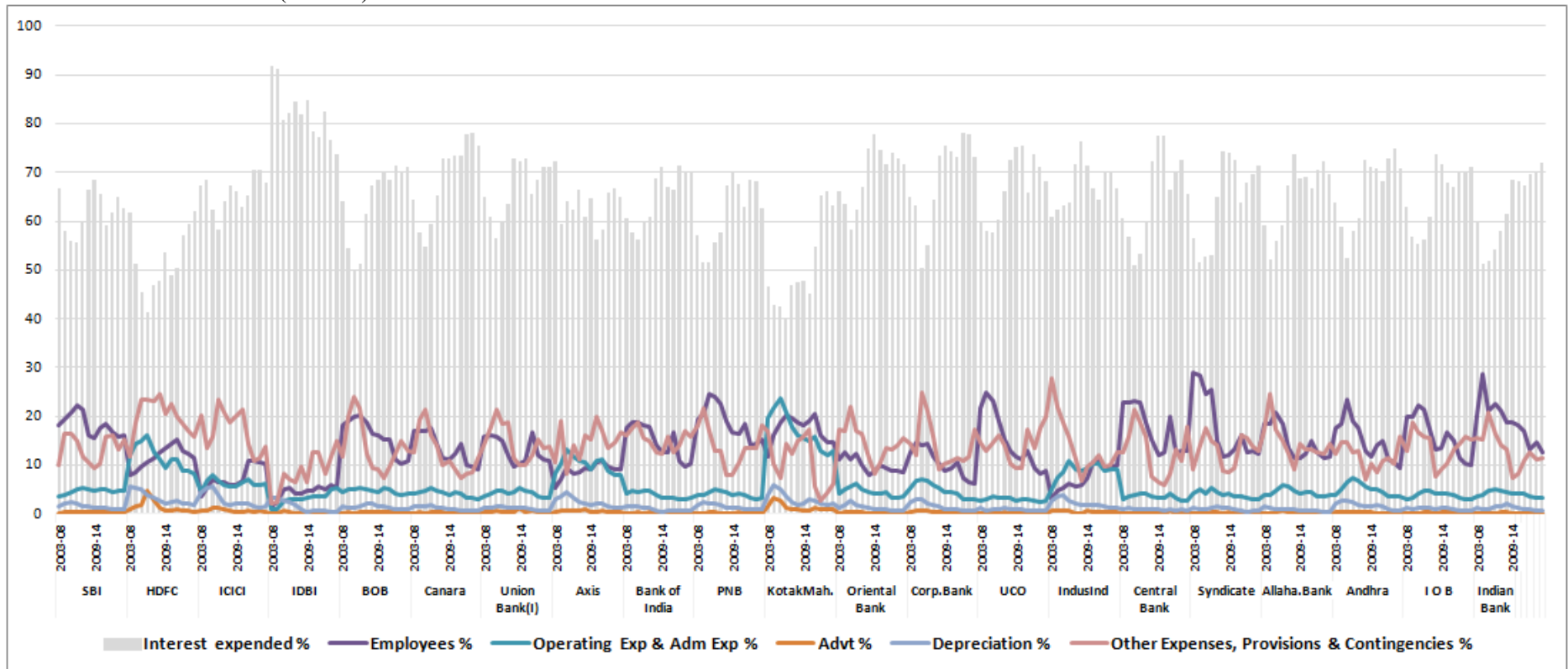


Source: Compiled and calculated by the researcher

Figure 4.3 shows overviews about the cost structure of this industry. Interest expenditure (avg. 60%) is the major cost element of the Banking industry in pre (2003-08) and post-recession (2009-14) periods followed by Other expenses and Provisions & cont.(avg.14.63%) and Employee cost (avg.14.18%) and Operating expenses (avg.5.23%). During the post-recession period all companies in banking industry able to control Operating & Admin.expenses, Other expenses and Provisions & Cont. In post-recession periods, Interest expenditure is growing rapidly. This may be due to the influence of market-related factors and cannot be controlled by a bank internally to a significant extent. Consequently, the profitability power of the banking industry is decreasing during post-recession period.

In figure 4.4 (shown below) give us overviews, i.e. most of the selected Companies' main cost element is Interest expenditure during pre and post recession.

FIGURE 4.4: COST STRUCTURE OF SELECTED COMPANIES UNDER BANKING INDUSTRY, DURING PRE-RECESSION (2003-08) AND POST-RECESSION (2009-14) PERIODS



Source: Compiled and calculated by the researcher

Among selected banks, it is evident that Interest expenditure as a major cost element, which is around 65% of the total cost. This is quite obvious for the banking industry as it arises from the core activity of deposit mobilization. It is also apparent that State Bank of India and HDFC Bank were able to manage efficiently of the major cost element. On the other hand, IDBI Bank and Canara Bank are not able to do so. Other major cost elements in this industry are Operating expenses and Provisions & contingencies. The results indicate that most of the sample companies have tried to reduce during this period except IDBI and Bank of India. In the case of State Bank of India & Punjab National Bank, ‘Employee cost’ is the second major cost element, but selected companies reduce this cost during the study periods.

As it has been observed that Interest expended, Employee cost, Other exp. Prove. Cont. expenses and Operating exp. & Adm. expenses are the main cost elements in the banking industry. *Table 4.2* below shows the result of ABJ regression model for banking industry.

TABLE 4.2: RESULTS OF THE ABJ’s REGRESSION MODEL FOR VARIOUS COST CATEGORIES UNDER BANKING INDUSTRY

		Interest Expended	Employee Cost	Other. Exp. Prov. Cont.	Operating Exp.& Adm. Exp.
Coefficients Beta	β_0 (Intercept)	-0.039	0.062	0.087	0.063
	β_1 (Direct Effect)	1.572 (.000)	-0.068 (.758)	-0.243 (.486)	.097 (.548)
	β_2 (Sticky Measure)	0	0	0	0
Adjusted R Square		0.944	0.011	0.055	0.042
F		171.148 (.001)	0.101 (.758)	0.529 (.486)	0.390 (.548)

Note: ‘Significant’ levels are shown in parenthesis.

Source: Compiled and calculated by the researcher

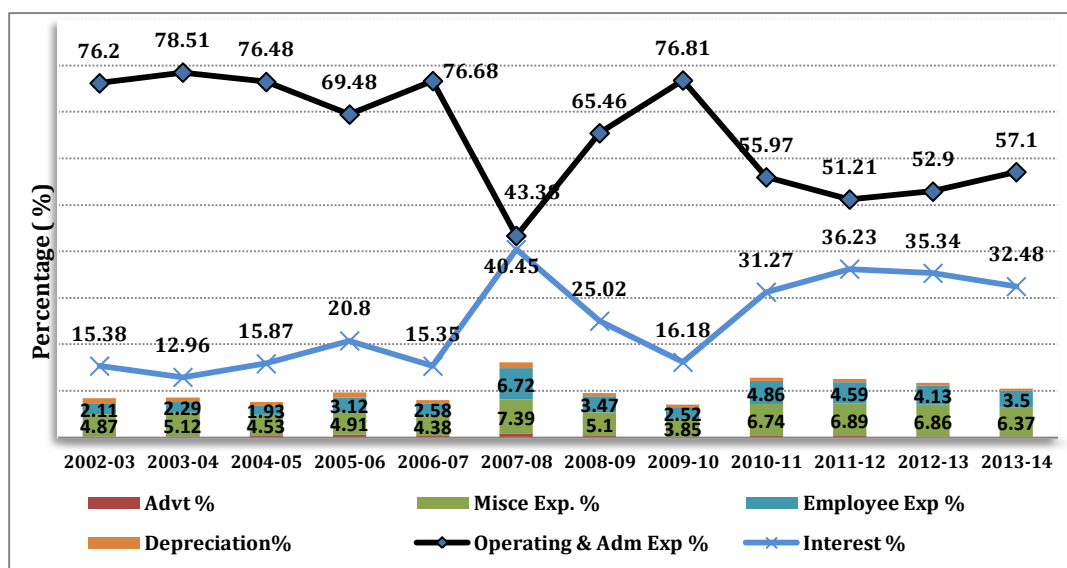
The overall result indicates that selected costs do not exhibit sticky cost behaviour. The coefficient on the sticky cost variable is equal to zero and significant only for Interest expended. The results of estimating ABJ regression of models with major costs indicate that selected costs do not exhibit stickiness and significant only for Interest Expended. The estimate for β_2 is zero, as we know that if the traditional fixed and variable-cost model is valid, then the value of β_2 will be zero because the upward and downward changes in costs will be equal. The degree of explanation of

the model is quite high since the adjusted coefficient of determination comes to 94.4% only for Interest expended.

4.4.3 Finance Industry

Graphical representation of the cost structure of Finance industry (figure 4.5) provides a visual display of major cost elements during the study periods starting from financial year end March 2003 to financial year end March 2014. The results are shown in figure 4.5 and 4.6

FIGURE 4.5: COST STRUCTURE OF FINANCE INDUSTRY FOR 12 YEARS.

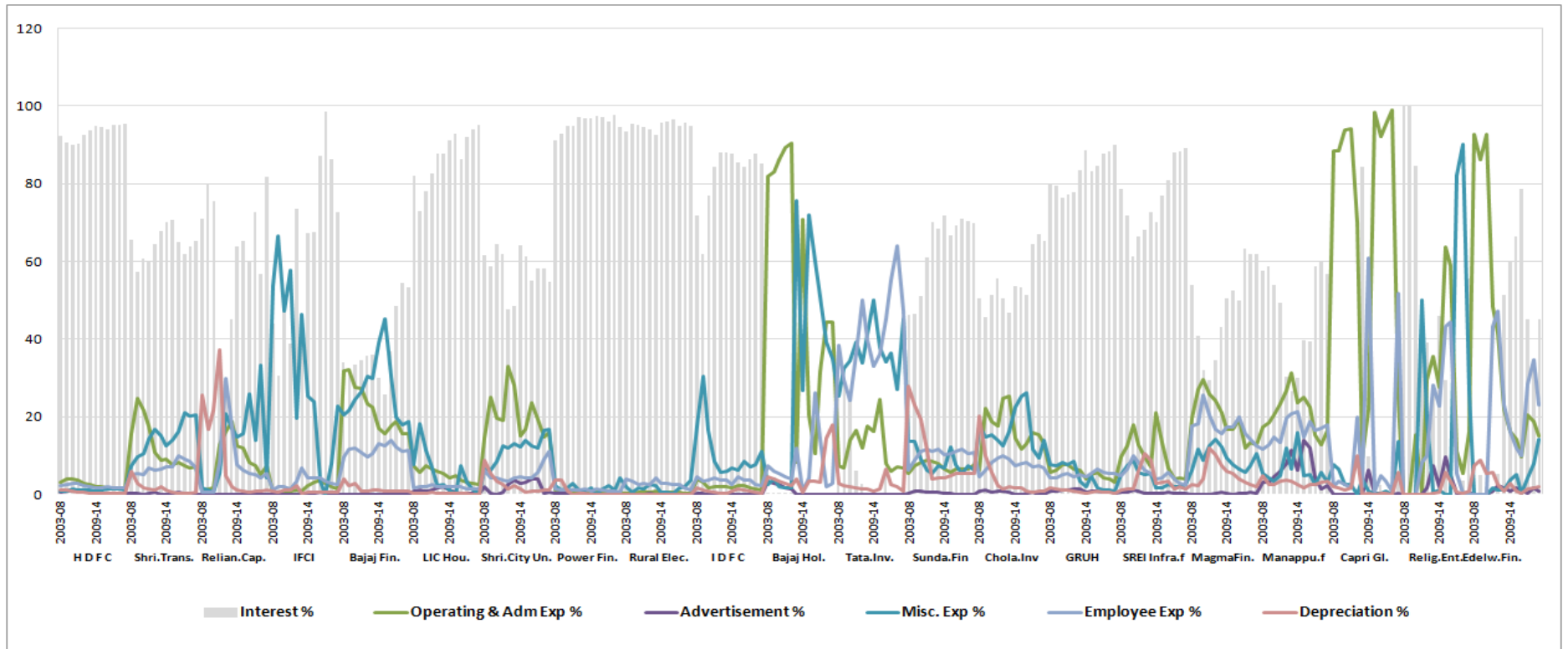


Source: Compiled and calculated by the researcher

Figure 4.5, gives us a picture about of the cost structure of the finance industry. Operating & Adm. expenses are the major cost element of the Finance industry in pre (2003-08) and post-recession (2009-14) periods, i.e. average 58% and 60% respectively, followed by Interest expenses (average 24%). Although both costs show a fluctuating trend over the years, overall a declining trend is observed for Operating & Adm. expenses. However, in a case of Interest expenses, the result shows an increasing trend on an average. It is also notable that the relation between these two major cost elements is in opposite directions, i.e. when Operating & Adm. expenses are increasing then Interest cost is going down and *vis-a-vis*. Before recession starting Operating & Adm. expenses cost was an average of 75 %, but in 2008 it falls to 43.38 %, on the other hand, interest expenses which were an average of 15% during 2003-07 increasing rapidly to 40.45 % in 2008. During the post-recession period, all companies in Finance industry were slightly able to control Employee cost. Interest expenditure and Operating & Adm. expenses of the sample companies are the major cost elements.

In below *figure 4.6* give an overview, i.e. most of the selected companies' main cost element is Interest expenditure during pre and post recession, except two companies i.e. IFCI and Bajaj Finance.

FIGURE 4.6: COST STRUCTURE OF SELECTED COMPANIES UNDER FINANCE INDUSTRY, DURING PRE-RECESSION (2003-08) AND POST-RECESSION (2009-14) PERIODS



Source: Compiled and calculated by the researcher

In the previous *figure 4.6*, we have seen that Interest expenditure is the major cost elements and accounted as an average more than 80% of total expenditure for HDFC, LIC Housing Fin, Power Finance Corp., Rural Elec.Corp. and IDFC. Miscellaneous expenses of IFCI, IDFC, Bajaj Fin and Shriram Trans. are very high during this period, they able to reduce it proportionately in post-recession periods, except for Shriram Trans. A major cost element of the industry ‘Operating & Admn. exp’ is in decreasing trend. Among the selected companies Shri.City Union., Bajaj Fin. and Shriram Trans. are spending more on ‘Operating & Admn. exp’.

Table 4.3 below shows the result of ABJ regression model for Finance industry, with major cost elements viz., Operating & Admin. expenses, Misc. expenses, Interest expenses and Employee expenses.

TABLE 4.3: RESULTS OF THE ABJ’s REGRESSION MODEL FOR VARIOUS COST CATEGORIES UNDER FINANCE INDUSTRY

		Operating and Admin. Expenses	Misc. Expenses	Interest Expenses	Employee Expenses
Coefficients Beta	β_0 (Intercept)	-0.028	-0.023	-0.005	-0.011
	β_1 (Direct Effect)	1.676 (.000)	0.838 (.011)	0.507 (.069)	.485 (.170)
	β_2 (Sticky Measure)	0.443 (.386)	-0.804 (.180)	-1.174 (.055)	-1.120 (.145)
Adjusted R Square		0.965	0.626	0.239	0.061
F		138.344 (.001)	9.381 (.008)	2.573 (.137)	1.326 (.318)

Note: ‘Significant’ levels are shown in parenthesis.

Source: Compiled and calculated by the researcher

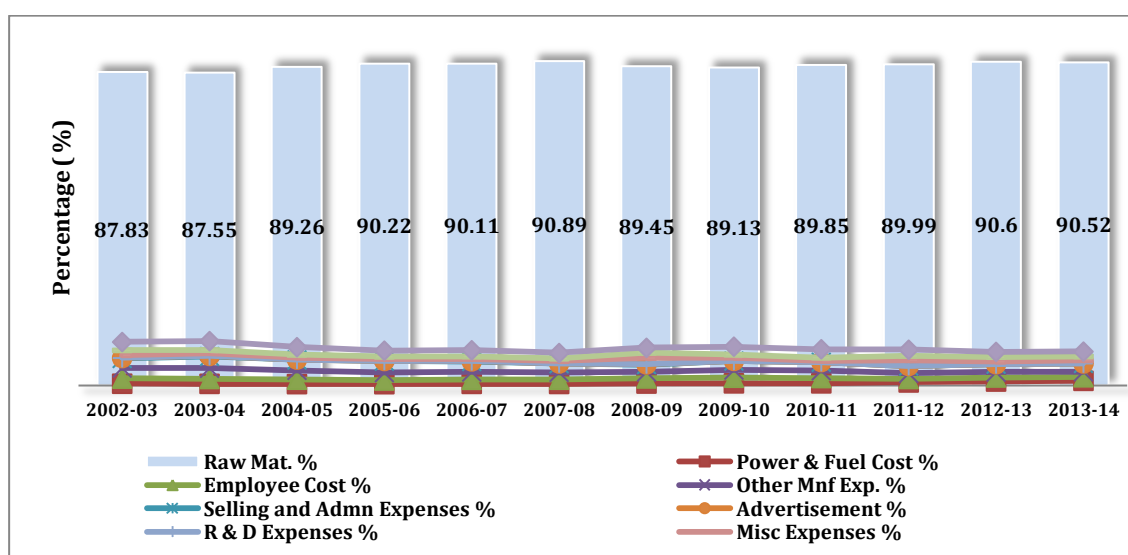
From *Table 4.3*, we have seen, β_1 for major cost elements are Operating & admin. expenses (1.676), Misc. expenses (0.838), Interest expenses (0.507) and Employee expenses (0.485). Here, we get an evidence of sticky cost behavior with an estimate of β_2 of Misc. expenses, Interest expenses, and Employee expenses are respectively, -0.804, -1.174 and -1.120; whereas anti-sticky (0.433) for Operating & Admin. expenses. The Coefficient of Determination, in Misc. expenses (Adjusted $R^2=0.626$) and Operating & admin. expenses (Adjusted $R^2=0.965$) indicating the fact that, regression models are well fitted which is confirmed by the statistically significant F values.

However, the results of ABJ regression for Misc. expenses, Interest expenses and Employee expenses indicate cost stickiness. β_2 of Misc. expenses is -0.804 (but insignificant), Interest expenses is -1.174 (significant) and for Employee expenses is -1.120 (insignificant). The observed values of Adj. R^2 is 0.239 and F-statistic is 2.573 for Interest expenses, thus, sufficient to speak that it not fit with the regression model.

4.4.4 Refineries Industry

Graphical representations of the cost structure of Refineries industry provides us a visual display of major cost elements during the study periods. The results are shown in figure 4.7 and 4.8

FIGURE 4.7: COST STRUCTURE OF REFINERIES INDUSTRY FOR 12 YEARS.

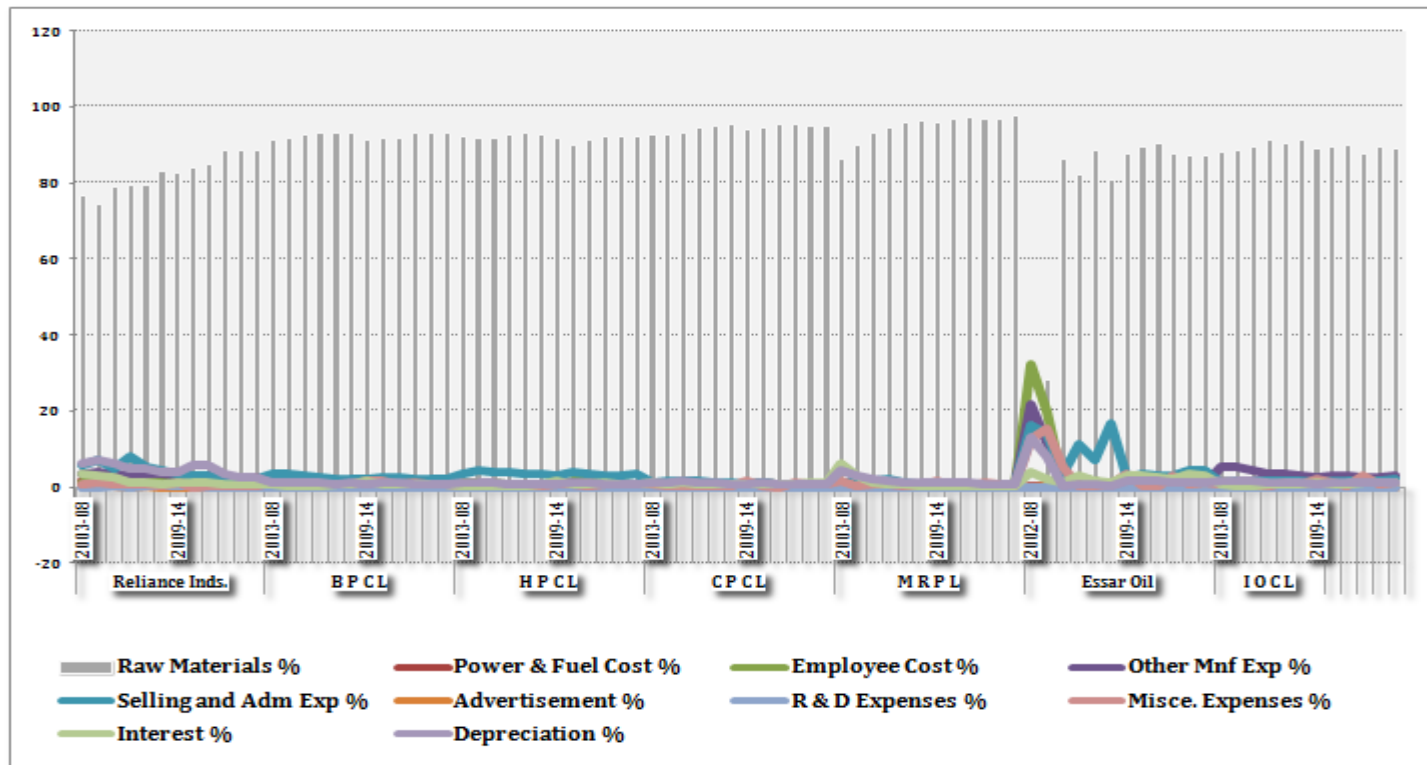


Source: Compiled and calculated by the researcher

Figure 4.7 shows overviews about the cost structure of the Refineries industry. Raw Material cost is the main cost element of the Refineries industry in pre (2003-08) and post-recession (2009-14) periods. The average Raw materials cost is in increasing trend, i.e. varies from 87.83 % to 90.89% of the total cost incurred by the companies and average spending for Raw materials cost is higher in post-recession periods. Other cost elements likes- Depreciation, Employee cost, Misc expenses, Selling & administration expenses and Employee cost accounted only 10 % of the total cost.

Figure 4.8 give us a result as per with industry' outcomes, i.e. most of the selected Co's main cost elements is Raw materials in pre and post-recession.

FIGURE 4.8: COST STRUCTURE OF SELECTED COMPANIES UNDER REFINERIES INDUSTRY, DURING PRE-RECESSION (2003-08) AND POST-RECESSION (2009-14) PERIODS



Source: Compiled and calculated by the researcher

In sample companies, Raw materials cost was accounted as an average 85-90% of the total cost and it slightly increases during post-recession periods. Essar oil has a different cost structure, ‘Employee cost’ and Other manufacturing expenses are the major cost element in early pre-recession periods. In the post-recession period all the sample companies in this industry try to control major costs, i.e. Employee costs, Operating costs and Selling & administration expenses.

For applying ABJ regression model we have taken Raw materials, Other Manuf. expenses and Selling & Admn. expenses as they are the main cost elements in refineries industry. *Table 4.4* below shows the results of ABJ regression model for Refineries Industry.

TABLE 4.4: RESULTS OF THE ABJ’s REGRESSION MODEL FOR VARIOUS COST CATEGORIES UNDER REFINERIES INDUSTRY

		Raw Materials Expenses	Other. Manuf. Expenses	Selling & Admn. Expenses
Coefficients Beta	β_0 (Intercept)	0.004	-0.014	0.035
	β_1 (Direct Effect)	1.001 (.000)	0.908 (.001)	0.689 (.004)
	β_2 (Sticky Measure)	-0.016 (.869)	0.094 (.815)	0.853 (.005)
Adjusted R Square		0.99	0.839	0.863
F		511.74 (.001)	27.078 (.001)	32.402 (.001)

Note: ‘Significant’ levels are shown in parenthesis.

Source: Compiled and calculated by the researcher

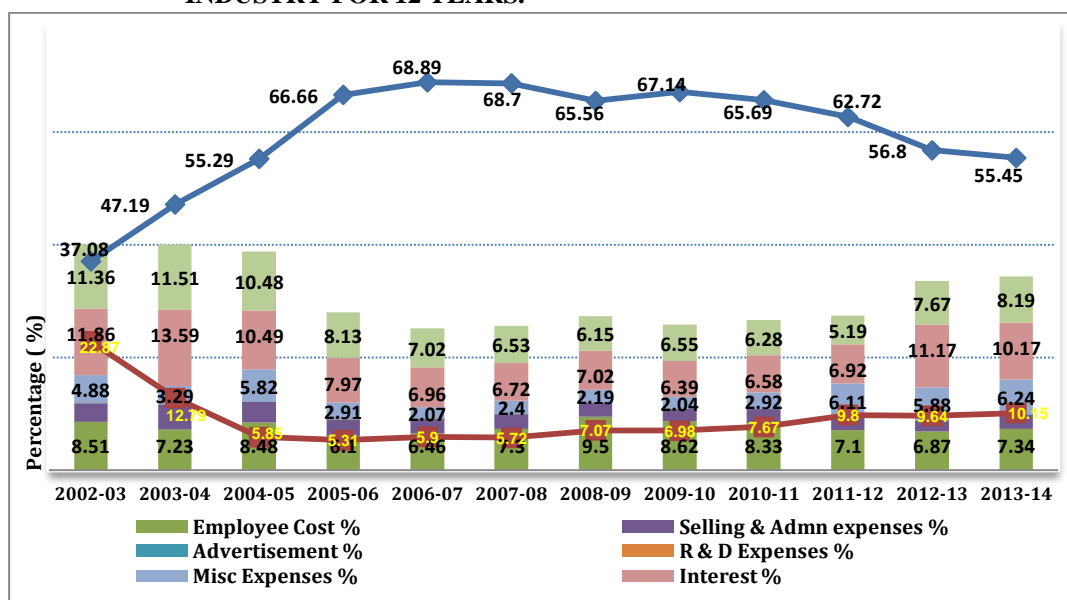
Although we find difference estimate for β_1 in the full sample for major cost elements, i.e. Raw materials (1.001), Other Manuf. Expenses (0.908) and Selling & Admn. expenses (0.689) respectively. However, the coefficient of β_2 for Raw Materials (-.016), Other Manuf. expenses (0.094) and Selling & Admn. expenses (0.853) are not only positive but also relatively large. As per the interpretation of the ABJ regression model, the Raw materials cost follow costs stickiness, but ‘Other Manuf. Expenses’ and Selling & Admn. expenses follow anti-sticky behaviour. Here, only Selling & Admn. expenses are significant (.005), $\beta_2=0.853$, i.e. $\beta_1 + \beta_2 = 1.542$ (0.689 + 0.853). Result indicates that Selling & Admn. expenses increase by 0.689% for 1% increase in revenue and, decreases 1.542 % when revenue decline 1%. The observed R^2 value and significant F statistic advocate in

favour of the appropriateness of the regression model used in the present context for all the cost components.

4.4.5 Power Generation & Distribution Industry

Graphical representations of the cost structure of Power Generation & distribution industry give us an overview of major cost elements during the study periods starting from financial year end March 2003 to financial year end March 2014. In *figure 4.9* we have seen that Electricity & Fuel expenses are the major cost element of Power generation & distribution industry during pre and post-recession periods.

FIGURE 4.9: COST STRUCTURE OF POWER GENERATION & DISTRIBUTION INDUSTRY FOR 12 YEARS.

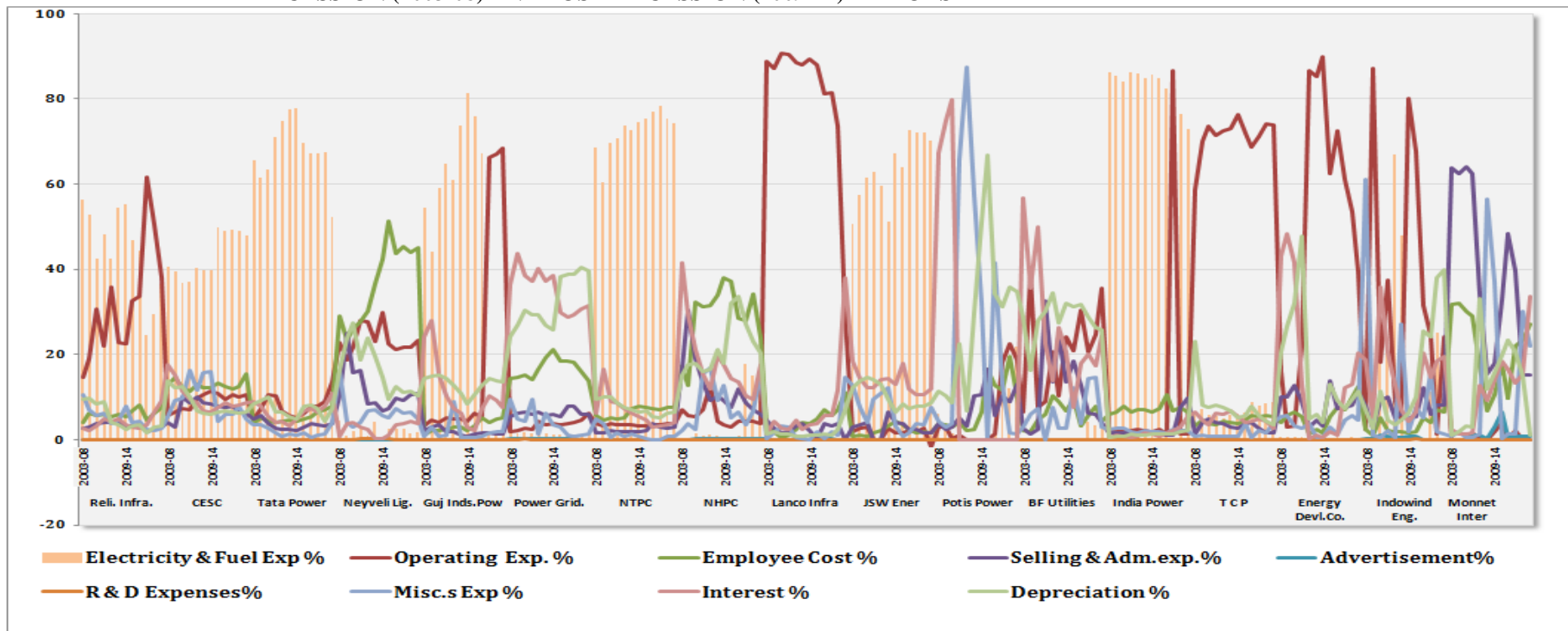


Source: Compiled and calculated by the researcher

Graphical representations of Electricity & Fuel expenses give us an overview that in pre-recession periods, it was on an increasing trend (37% to 68.7%), but decreasing in post-recession periods (67 % to 55%).As the major cost element of the industry is decreasing; simultaneously, others cost elements likes - Interest expenses, Operating expenses, and Misc. expenses are increasing slightly during post-recession periods. Employee cost was 9.5% in FY 2009; it decreases to 7.34 % in FY 2014. Before recession starting, an Electricity & Fuel expense was an average 55 %, but in the post-recession period it was an average 60 % of the total cost.

In figure 4.10, only seven companies' cost structure are as per with industry' cost structure, i.e. their main cost element is Electricity & Fuel exp. On the contrary, most of the companies have spent more in Operating expenses, Employee cost and Interest along with Power & Fuel expenditure.

FIGURE 4.10: COST STRUCTURE OF SELECTED COMPANIES UNDER POWER GENERATION & DISTRIBUTION INDUSTRY, DURING PRE-RECESSION (2003-08) AND POST-RECESSION (2009-14) PERIODS



Source: Compiled and calculated by the researcher

Figure 4.10 shows overviews about the cost structure of the Power generation & distribution industry. Electricity & Fuel expenditure is the major cost element among most of the selected companies, again, Operating expenses, Employee cost, and Interest expenses are also major cost elements for some companies as per their business structure. Power & Fuel expenditure accounted on an average more than 75% for NTPC and - 70% for JSW Energy, 68% for Tata Power Co, 48 % for CESC and 45 % for Reliance Infra. During post-recession period, Electricity & Fuel expenditure of Guj.Inds. Power decreasing rusticity, but, Operating cost increasing more than that during the study periods. Neyveli Lignite and NHPC spend more in Employee expenditure, i.e. 45% & 24% respectively; it is a major cost element for those companies.

For applying ABJ regression model we have taken Electricity & Fuel Charge, Operating expenses, Interest expenses and Employee cost as they are the main cost elements in the Power Generation & distribution industry. Table 4.5 below shows the result of ABJ regression model for Power generation & distribution industry.

TABLE 4.5: RESULTS OF THE ABJ's REGRESSION MODEL FOR VARIOUS COST CATEGORIES UNDER POWER GENERATION & DISTRIBUTION INDUSTRY

		Electricity & Fuel Charge	Operating Expenses	Interest Expenses	Employee Cost
Coefficients Beta	β_0 (Intercept)	0.061	-0.078	0.152	0.046
	β_1 (Direct Effect)	0.568 (.284)	1.594 (.303)	-0.832 (.340)	.405 (.571)
	β_2 (Sticky Measure)	1.459 (.185)	-1.143 (.708)	3.982 (.044)	1.128 (.442)
Adjusted R ²		0.682	0.035	0.434	0.459
F		11.731 (.004)	1.181 (.355)	4.835 (.042)	3.397 (.086)

Note: 'Significant' levels are shown in parenthesis.

Source: Compiled and calculated by the researcher

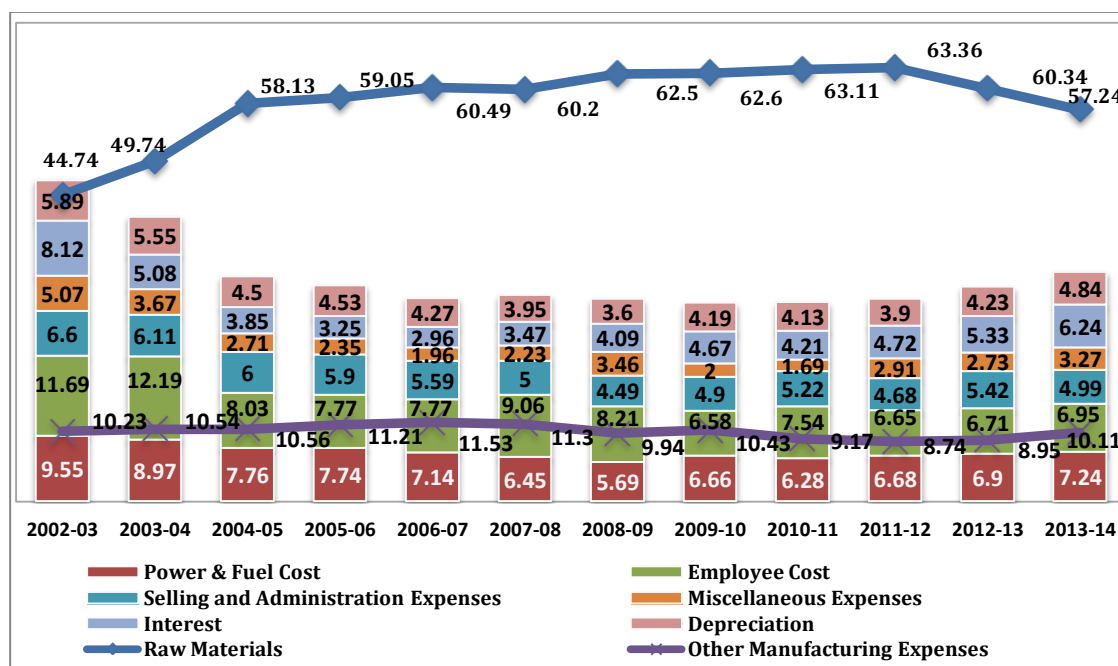
The results of estimating the regression of models with Operating expenses indicate that selected cost exhibit stickiness. The Beta coefficient of Operating expenses is -1.143 but insignificant (.708). Although we find difference estimate for β_1 in the full sample for major cost elements, i.e. Electricity & Fuel Charge, Operating expenses, Interest expenses and Employee cost are 0.568, 1.594, -0.832 and 0.405 respectively.

However, the coefficient of β_2 is found for Electricity & Fuel Charge ($\beta_2 = 1.459$), Interest expenses ($\beta_2 = 3.982$) and Employee Cost (1.128) is positive and large but not match with all those criteria. The results of ABJ regression of models with Interest expenses ($\beta_2 = 3.982$) exhibit anti-stickiness and significant (0.434), but observed R^2 value and F statistic advocate not favour of the appropriateness of the regression model used in the present context.

4.4.6 Steel Industry

Graphical representations of cost structure of Steel industry provides a visual display of major cost elements during the study periods starting from financial year end March 2003 to financial year end March 2014. The results are shown in figure 4.11 and 4.12.

FIGURE 4.11: COST STRUCTURE OF STEEL INDUSTRY FOR 12 YEARS.

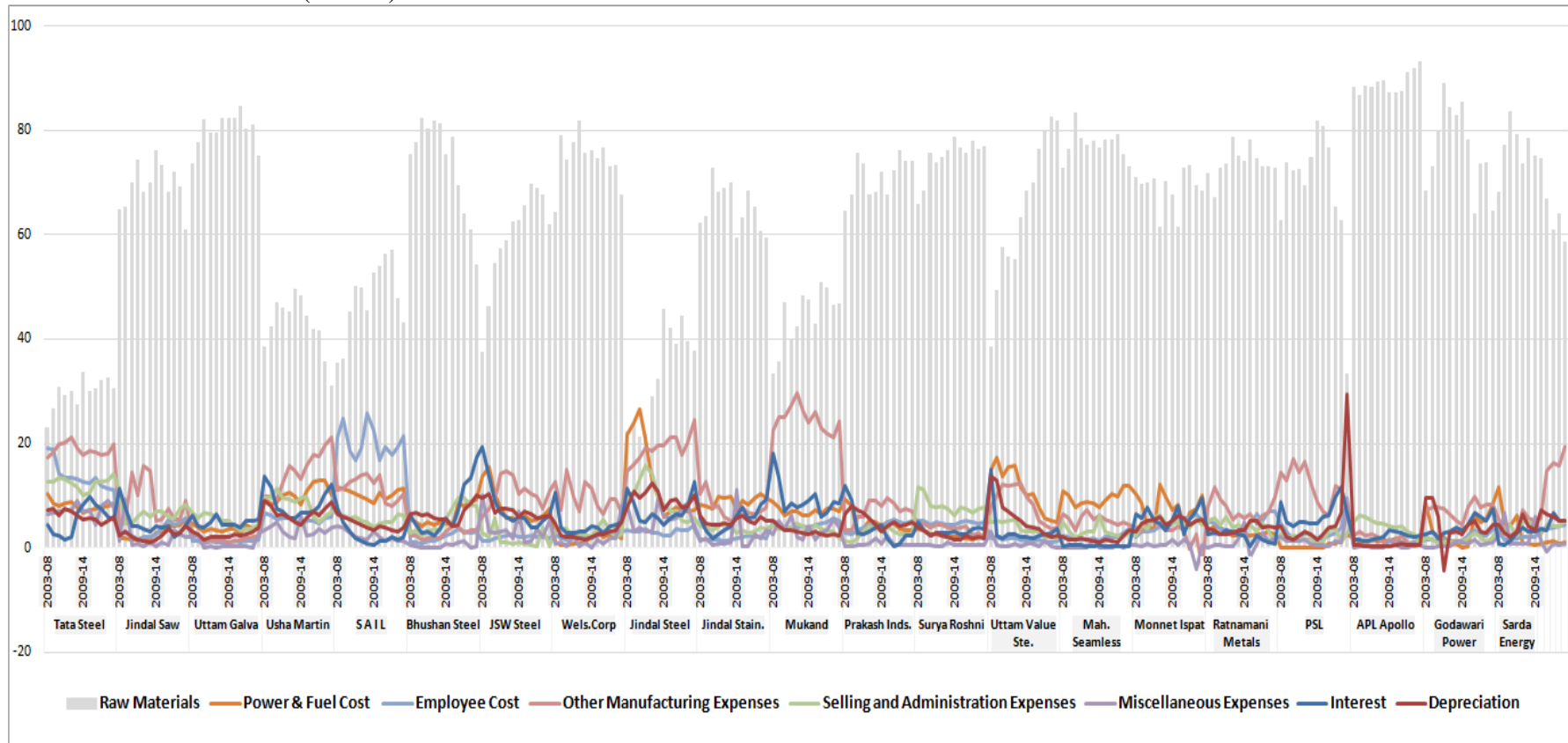


Source: Compiled and calculated by the researcher

Figure 4.11, shows the movement of different cost components of the Steel industry. Raw materials is the major cost element (average 51%) of the Steel industry during pre (2003-08) and post-recession (2009-14) periods, followed by Employee Cost (avg.10%) in pre-recession periods and Other Manufacturing expenses (avg.10%) in post-recession periods. In recession periods there are increasing trend in Raw materials cost and Employee Cost is in reverse trends, i.e. decreasing rapidly during the study periods. During the post-recession period, all companies in the Steel industry were able to control Employee cost.

Figure 4.12 give us a result as per with industry outcomes, i.e. most of the selected companies' main cost element is Employee cost in pre and post-recession periods.

FIGURE 4.12: COST STRUCTURE OF SELECTED COMPANIES UNDER STEEL INDUSTRY, DURING PRE-RECESSION (2003-08) AND POST-RECESSION (2009-14) PERIODS



Source: Compiled and calculated by the researcher

Figure 4.12 shows, Raw materials cost is the major cost elements and accounted as an average more than 70% of total expenditure for Jindal Saw, Uttam Galva, Bhushan Steel and Welspun Corp. Other Manufacturing expenses of Tata Steel, Usha Martin and Jindal Steel are high during this period and they reduce it proportionately in post-recession periods except Jindal Steel. The major cost element of the selected companies is increasing trend in post-recession periods. Finally, we observe that four major cost elements are viz. Raw materials, Other Manufacturing expenses, Power & Fuel cost and Selling and Administrative expenses.

For applying ABJ regression model we have taken Raw materials, Other Manufacturing expenses, Power & Fuel cost and Selling & Administrative expenses as they are the main cost elements in the Steel industry. Table 4.6 below shows the result of ABJ regression model.

TABLE 4.6: RESULTS OF THE ABJ’s REGRESSION MODEL FOR VARIOUS COST CATEGORIES UNDER STEEL INDUSTRY

		Raw Materials Cost	Power & Fuel Cost	Other Manuf. Expenses	Selling and Administration Expenses
Coefficients Beta	β_0 (Intercept)	-0.006	0.033	0.039	0.028
	β_1 (Direct Effect)	1.183 (.001)	.304 (.093)	.319 (.090)	.409 (.087)
	β_2 (Sticky Measure)	0	0	0	0
Adjusted R Square		0.876	0.201	0.208	0.213
F		71.87 (.001)	3.518 (.093)	3.619 (.090)	3.699 (.087)

Note: ‘Significant’ levels are shown in parenthesis.

Source: Compiled and calculated by the researcher

Here, β_1 in the full sample for major cost elements like; Raw Materials (1.183), Power & Fuel Cost (0.304), Other Manufacturing expenses (0.319) and Selling and Administrative expenses (0.409), respectively. The results of the regression model with major cost components indicate that selected costs do not exhibit cost stickiness (Table 4.6). As per the interpretation of the ABJ regression model, we know that if the traditional fixed and variable-cost model is valid then the value of β_2 will be zero because the upward and downward changes in costs will be equal.

Here, we find evidence of non-sticky cost behavior for the Raw materials . The observed R^2 value and significant F statistic advocate in favour of the appropriateness of the regression model used in the present context only for Raw Materials.

4.5 Summary: In this chapter, we got an idea of the major cost components of selected six industries, during the study periods from 2002-03 to 2013-14. Cost behavior analysis of the major cost components gives us an idea about the behaviours of the cost components, i.e. sticky, anti-sticky and non-stickiness of selected major cost variables. In the next, *Chapter 5*, we have analyzed the impact of the cost components.