CHAPTER VI

Summary and Conclusions
6.1 SUMMARY

The Cement industry occupies a predominant position both in building the industrial base of a country and in providing infrastructure for the development of the national economy. The cement industry has been playing a vital and significant role in the development and progress of human civilization. It is the most important item used in the construction of buildings, houses, dams, roads, offices and bridges, towering skyscrapers to dainty gardens, walks, shimmering fountains etc. It is considered as one of the basic infrastructure industries for development and it occupies an important place in the world. It is both a basic and a consumer industry. In the global context, India is the second largest producer of cement in the world after China, but she is ahead of the United States and Japan in this respect. At the national level, it is one of the major industries in the core sector. From an economic point of view, cement ranks next only to iron and steel industry in India.

Indian cement industry is globally competitive because the industry has witnessed healthy trends such as cost control and continuous technology upgradation. In the year 2009, the GDP growth slowed down to 6.7 per cent compared to the 9 per cent growth reported in the year 2008. However, cement consumption growth in the year 2009, at 8.4 per cent, has been able to maintain its multiplier factor with GDP growth at 1.25 times.

Because of the growing importance and need for cement, an attempt has been made to study the selected Indian cement companies with the following objectives. The specific objectives of the study are:

- To examine the growth and performance of the selected Indian cement companies;
- to analyse the productivity trends using partial and total factor productivity indices; and
- to study the relationship between capital intensity and labour productivity.
6.2 CONCLUSIONS

Growth and Structure

The growth rates of value of output have increased for all companies and are significant at 1 per cent level for eleven companies. It is observed that the total assets and gross fixed assets of eleven companies out of twelve have registered positive growth rates and only one company (Kalyanpur Cements Ltd.) has registered negative growth rate. In the case of net fixed assets, it is observed that out of twelve companies eight companies have registered positive growth rates and the remaining four have registered negative growth rates. It is also observed that only three companies posted positive growth regarding the number of employees, while the other nine companies have registered negative growth. Salaries & wages and cost of production have registered positive growth for eleven companies. Only one (Cement Corporation India Ltd.) company has registered negative growth rate.

From the analysis, it is observed that the total Income and Net income of twelve companies registered positive growth rates and are significant at 1 per cent level. Further, it is concluded that the raw material expenses and power & fuel consumption of twelve companies have registered positive growth and the growth rates are significant at 1% and 5% respectively. It is also observed that the growth rate of interest on payments for the ten companies out of twelve selected companies have registered positive growth rates and the other two registered negative growth rates.

Production function

The production function is a highly abstract concept that has been developed to deal with the technological aspect of the theory of production. The most widely used production function for empirical estimation purpose, the Cobb-Douglas production function has been used to measure the influence of the independent variables on the depend variable. It is observed from the analysis that the coefficient of capital of nine companies registered positive growth and the other three companies have registered negative growth during the study period.

It is concluded from the analysis that the coefficient of labour of five selected companies has registered positive growth whereas in the case of the remaining seven companies it registered negative growth. Similarly, it is observed from the sum of the elasticity of parameters, that only one company is under increasing return to scale,
fivermpanies are under constant returns to scale and that six companies are under diminishing return to scale among the selected companies of the study.

The Marginal Productivity of Capital (MPK) registered positive growth for ten companies out of twelve and it indicates that an increase of one unit of additional capital will increase the overall output. The remaining two companies are registered negative growth and this indicates that an increase of one unit of capital will decrease the overall output. It is also observed that the marginal productivity of labour (MP_L) registered positive growth for only five companies out of twelve companies, and it implies that an increase of one unit of additional labour will increase the overall output. The remaining seven companies registered negative growth implying that an increase of one unit of additional labour will decrease the overall output.

**Capital Productivity, Labour Productivity and Capital Intensity Trends**

Labour and capital productivity indices have been computed to assess the efficiency of individual factor inputs. Besides the partial productivity indices of labour and capital inputs, the capital-labour ratio, popularly known as capital intensity, has also been computed for each cement company. This ratio is not only of intrinsic interest as a measure of capital deepening but is also a determinant of labour productivity. For analytical purpose the data related to 12 cement companies in India during 1999-2009 have been selected.

The labour productivity, capital productivity and capital intensity for the selected Indian cement companies have been measured by using appropriate technique. It is concluded from the analysis that the productivity indices of all the selected companies have registered positive growth and are statistically significant at 5 per cent level implying that the labour input has a positive influence on the production of all companies. It is observed that the capital productivity indices of nine companies have registered positive growth and it indicates that there is a positive influence of capital productivity on production. The other three companies have registered negative growth implying that the capital productivity has a negative influence on the overall production.
Relationship of Labour Productivity with Capital Intensity

An analysis has been made to explain the functional relationship between labour productivity and capital intensity for the selected Indian cement companies during the period 1999-00 to 2008-09.

It is clear from the analysis that there is a significant relationship between capital intensity and labour productivity in A C C Ltd, Birla Corporation Ltd, Cement Corporation of India Ltd, Chettinad Cement Corporation Ltd, Grasim Industries Ltd, Gujarat Sidhee Cement Ltd, Heidelberg Cement India Ltd, India Cements Ltd, Kalyanpur Cements Ltd, Madras Cements Ltd and Shree Cement Ltd. In the case of Mangalam Cement Ltd., there is an insignificant association between capital intensity and labour productivity. The effect of technical change on labour productivity has been estimated by using the second equation. It is clear that there is a significant effect of technical change on labour productivity in Birla Corporation Ltd, Cement Corporation of India Ltd, Chettinad Cement Corporation Ltd, Gujarat Sidhee Cement Ltd, Heidelberg Cement India Ltd and Madras Cements Ltd. This indicates that technical change has influenced labour productivity favorably in these companies.

Total Factor Productivity (TFP)

Our empirical results have shown divergent trends in partial factor productivity ratios. So it is not possible to infer about the overall efficiency of the selected cement companies in India. Under the circumstances we have to take recourse to total factor productivity approach. The productivity trends are investigated for each company by computing Total Factor Productivity indices based on the following methodology, suggested for estimation of TFP. Here we considered three methods for measuring TFP, namely, Solow, Kendrick and Divisia index, which differ from one another with regard to weighting scheme.

To measure the total factor productivity the Kendrick, Solow and Translog indices have been calculated. Our empirical estimates clearly highlighted the TFP growth performance of selected 12 cement companies in India, during the period 1999-2009. We observed that there is a marked fall in the growth rate of TFP. Regarding the comparability of the trends of three measures of TFP, the value of the Solow and Divisia were almost similar in most of the cases, but the values of Kendrick indices were somewhat different.
The TFP indices of Kendrick index registered positive growth for the Cement Corporation of India Ltd, Chettinad Cement Corporation Ltd, Heidelberg Cement India Ltd, Kalyanpur Cements Ltd and Shree Cement Ltd. Grasim Industries Ltd recorded a negative growth and it is significant at 1 per cent level. ACC Ltd, Gujarat Sidhee Cement Ltd and Madras Cements Ltd., registered positive growth and are significant at 5 per cent level. Birla Corporation Ltd, India Cements Ltd and Mangalam Cement Ltd., registered positive growth but they are not statistically significant.

From the analysis we concluded that the growth of TFP indices of Solow index for ACC Ltd, Birla Corporation Ltd, Chettinad Cement Corporation Ltd, Grasim Industries Ltd, Heidelberg Cement India Ltd, Madras Cements Ltd and Mangalam Cement Ltd., shows a declining trend during the study period, but the growth of TFP of Cement Corporation of India Ltd, Gujarat Sidhee Cement Ltd, India Cements Ltd, Kalyanpur Cements Ltd and Shree Cement Ltd., indicates a positive but insignificant trend.

It is observed that the growth of TFP indices of Divisia index, for the Cement Corporation of India Ltd, Chettinad Cement Corporation Ltd, India Cements Ltd, Kalyanpur Cements Ltd and Shree Cement Ltd., is positive but insignificant during the study period. The growth of TFP indices is negative and is insignificant for the ACC Ltd, Birla Corporation Ltd, Grasim Industries Ltd, Gujarat Sidhee Cement Ltd, Heidelberg Cement India Ltd, Madras Cements Ltd and Mangalam Cement Ltd.