SUMMARY, CONCLUSIONS & SUGGESTIONS
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The study relating to cost of generation, transmission and distribution and financial analysis presented in the foregoing chapters are now summerised. The objective of the study was somewhat restrictive in the sense that the focus of the study has been on the cost aspects of M.S.E.B. regarding, generation, transmission and distribution. Statistical cost analysis with the help of multi-regression cost functions, and analysis of financial data with the help of common-size statement and accounting ratios.

An attempt was made in chapter '2' to examine cost trends, of generation and transmission and distribution. To segregate the impact of inflationary factors the actual cost has been compared with the deflated cost. During the period of study the actual cost of generation has increased at the rate of 22.36 per cent every year. The absolute increase in the cost might have caused due to the augmentation of activities of M.S.E.B. Therefore the cost of generation has been expressed in terms of per unit cost. And it is found that the per unit cost has increased from
9.5 paise to 26.5 paise. Therefore it is clear that there has been increase in cost of generation at both the levels, namely, total cost as well as per unit cost.

It is necessary to segregate the inflationary factor in understanding the changes in cost of generation. Therefore by using deflation technique the total cost of generation and the per unit cost of generation have been restated as deflated total cost and deflated per unit cost. The analysis also reveals that over a period of 1975-76 to 1984-85 the total deflated cost has increased significantly. The Per Unit deflated cost of generation has increased from 4.31 paise to 5.31 paise. When the per unit deflated cost compared with per unit actual cost it is noticed that the trend of increase or decrease is gradual as compared to actual cost. Therefore it can be concluded that the cost of generation is more influenced by the price factors and the non price factors have very little influence.

The analysis of cost of transmission & distribution reveals that the cost have been continuously increasing over a period. The per unit actual cost of transmission & distribution is
also increasing. And it is almost 169 per cent (from 5.5 to 9.32 paise). Whereas the deflated cost has increased at much lower rate. And moreover the per unit deflated cost of transmission and distribution has actually declined from 2.5 paise per unit in 1975-76 to 1.08 paise per unit in 1984-85. The increase in total deflated cost clearly indicates that the increase in total cost has been caused mainly on account of increase in the total power required to be transmitted. The declining deflated per unit cost of transmission and distribution shows the efficient use of transmission and distribution infrastructure. The total energy sold by M.S.E.B. during the period of study has increased from 6995.2 MKWH to 17182.9 MKWH. This increase in the energy sold clearly indicates that the economies of scale have been generated and it has favourable influence on cost of transmission & distribution.

The statistical analysis of cost of generation and cost of transmission and distribution has been attempted in Chapter No. '2'. A multi-regression log linear equation technique have been used to analyse the total cost of generation. Basically it was assumed to be a Cobb-douglas production
function. To have more meaningful results 7 equations representing different combinations of independent variables have been discussed. The statistical exercise reveals that the power generation cost function is a mongrel cost function and the factors like installed capacity, maximum demand on system, coal consumed and time trend fails to explain the behaviour of cost. The higher installed capacity appears to be significant explanatory variable and leads us to conclude that the total cost of generation is higher when the power generation stations have higher installed capacity. The time factor showed have been no significance because the earlier discussion reveals that the price factor is significant in increasing the total cost of generation and per unit cost of generation.

The statistical analysis of transmission and distribution reveals that the efficient utilisation of the facilities created for transmission and distribution reduces the cost of transmission and distribution. This supports the results obtained earlier by using deflation cost technique. The transmission and distribution losses appear to be very significant. Therefore, any efforts in
minimising the losses of transmission and distribution would help to reduce the cost of distribution. The Time trend is not significant in all equations.

This also supports earlier argument that the price factors have very little impact on cost of transmission and distribution.

The net sale of electricity by M.S.E.B. have continuously be increased over the period under study. The cost of electricity sold to net sales reveals that it is the most significant factor and consumes 68.00 to 96.4 per cent earnings.

Therefore any economy in this component would definitely increase the surplus of M.S.E.B. The operational expenses are increasing at a rate of 23.89 per cent. This increase is caused by cost of generation and cost of power purchased. Moreover there has been continuous increase in cost of coal required to be used at thermal power station. Though the cost of hydraulic power generation has reduced during the period, the increase in the cost of steam power generation, power purchased, cost of transmission and distribution has upset the benefit.
The percentage of increase in gross revenue is more than the percentage of increase in the cost of electricity sold. Therefore the gross revenue of M.S.E.B. has been increasing when compared to previous years. But the gross earnings are reduced, because the cost of electricity sold has been consuming major share of this revenue. The non-operating income is greatly influenced by the subsidy receipts from State Government for Rural Electrification losses and Rural Electrification Schemes.

The financial structure of M.S.E.B. is such that it does not have its own equity capital. And therefore it has to mainly rely on loans from State Government and bonds for capital investments. The non-operating expenses ranged between 27 to 33 percent of its total income during the period. The subsidy is the major source of revenue to M.S.E.B. According to provisions in Electricity Supply Ammendment Act 1978, the Board is required to adjust its tariff in such a way that it would to ensure that from its total tariff it would meet all the expenses as specified in modified section '67' of the Act. The financial statement of the Board shows that the Board could not earn any net
surplus and could not pay all the interest liabilities. Moreover since 1979-80 the Board has not provided for development Fund and Investment Allowance Reserve. The Board because of paucity of funds to be generated through revenue surplus could not pay interest on Government loans and require to carry it forward as contingent liability.

Over the last '10' years the cost of generation has went up significantly but there is no parallel increase in the electricity tariff. This factor has caused larger deficits in financial position.

The working capital position of the M.S.E.B. as indicated by its current assets and current liabilities appears to be satisfactory over a period of time. The ratio of current assets to current liabilities ranges between 1.25 to 2.21 times. It means a significant portion of the current assets have been financed from long term financial resources. The growth of current assets and current liabilities over the period of 10 years has also maintained perfect parity and the higher co-efficient of correlation shows that changes in current liabilities are perfectly reflected in the changes in current assets. On the whole the
working capital of M.S.E.B. appears to be satisfactory.

In India all the S.E.B.s. have an unique system of financing their activities. The S.E.B.s. do not have their own equity capital and the assets have been created through loans from State Government and other financial institutions. The ratio of total assets to total debts varies from 78.1 to 84.22. It means 21.90 to 15.78 of the total debts have been used for financing current assets. The ratio of total fixed assets to total debts when compared with the current ratio reveals the complete story. The trend of both the assets is completely complimentary to each other which shows that whenever there is decline in current ratio. It means increase in the total debts is not used for the creation of fixed assets. But are used in financing the working capital requirement. The coefficient of variation appears to be more in total fixed assets. Because all the debts are not created only to finance fixed assets. The margin of safety express in terms of the percentage difference of total fixed assets and total debts comes to 18.51 percent. In other words for every Rupee liability the assets of the M.S.E.B. are
valued at Rupee 1.185. It shows the ability of the M.S.E.B. to repay their loans even if the value of assets is eroded by 18.51 percent. Though this margin appears to be thin by the financial standards to be applied for any commercial firm. But it is satisfactory taking in to account the Government support that M.S.E.B. enjoys.

The interest coverage ratio for M.S.E.B is very low. On an average out of its earnings of 1.32; one Rupee is required to be paid by M.S.E.B. on its borrowings by way of interest. And therefore a very little surplus is left for repayment of loans and provision for developmental activities.

The operating efficiency of the M.S.E.B. can be judged by analysing return on capital employed. Over a period of 10 years M.S.E.B. has earned 5 % net surplus on its capital employed which is not satisfactory by any standards. The low rate of return on capital employed has been caused by deployment of capital on developmental work which would generate income after a considerable time lag. The table shows that the capital employed has been continuously increasing. And when it compared with the work-in-progress in every year it clearly
indicates that a major portion of capital employed is locked up in work-in-progress which can not generate any income unless it is completed.

The capital turnover ratio is calculated to measure the operational efficiency of M.S.E.B. The ratio has not shown much a significant changes over a period of time. It means the M.S.E.B. is working more or less at the same operational efficiency. This finding has again be strengthened by fixed assets turn over ratio. This ratio has also not shown any significant changes.

The ability of the M.S.E.B. to collect debts from its debtors is indicated by debtor's turnover ratio. Particularly in the last phase of the decade it appears that the efficiency in debt collections has gone down very significantly. This has greater effect on its working capital management and the same thing has been reflected on its working capital position.

The inventory turnover ratio has increased significantly over a period of time. The inventory of M.S.E.B. is mainly in the form of spares and material because there is no question of storage of finished or semifinished inventory.
1) The repairs and maintenance expenses are not showing any uniform trend but are showing wide fluctuations. It is mainly because of two reasons.

The repairs and maintenance cost has been expressed as a percentage of net sales. And the sales of the electricity are continuously increasing. If we take the total expenditure on repair and maintenance it is continuously increasing because the total assets are also increasing.

2) Secondly the developmental activities of the M.S.E.B. are on increasing scale and every year assets are added. Therefore the new assets usually requires less repairs and maintenance cost.

The unsatisfactory position of the working of the Board needs some remedial measures for improving the overall efficiency by minimising the revenue. Both these objectives can be achieved by the operation of a budgetary control popularly known as "Performance Budgeting and cost control" a technique used to facilitate cost control and performance evaluation by centres of responsibility.

To improve the financial performance, the Board has
to put greater emphasis on cost control, and efforts should be made to reduce the cost. Costs must be known before they can be controlled and should also be highlighted in a manner that indicates who should investigate what. This requires good management accounting system. There are certain broad areas and approaches for cost reduction that require consideration.

a) **Plant Utilisation:**

i) An integrated system of electricity supply over a large area.

ii) Efforts to flatten the load curve.

iii) Regular preventive maintenance.

iv) Reduction in plant downtime.

v) Control of transmission and line losses, norms for acceptable level of technical losses like pilferage, unauthorised connections, and mistakes in billing need to be controlled.

b) **Fuel Management:**

i) Improve fuel efficiency, establish norms for each generating stations.

ii) Control fuel loss in transit.

iii) Proper boiler maintenance to improve fuel efficiency.
iv) Install weighing bridge at generating station to record accurately the use of fuel.

c) Establishment:
   i) Rationalise staffing pattern.
   ii) Develop organisational norms for staffing.
   iii) Streamline procedures for staff review and evaluation.
   iv) Streamline payroll accounting with personnel department record, to avoid bogus payments.

d) Materials Management:
   i) Accounting unit for stores should be at substation level and centralised control at head office level.
   ii) Monthly reconciliation on value basis of individual stores' records. Weighted average method for valuation and perpetual inventory method for inventory accounting to be followed.
   iii) Periodic physical verification.
   iv) Control of wastage and appropriate precautions against leakage.
   v) Separation of purchase organisation from storekeeping.
   vi) Clearcut separation of construction stores and operation and maintenance stores.

e) Accounts Receivables:
f) Loans and Advances.
g) Suspense Account.
h) Cash Management.

Performance budgeting and cost control system should be introduced in the SEBs in order to control the cost at various levels of generation and transmission and distribution. For that purpose few suggestions are given as under:

1) Control over the gestation period for each of the various capital projects of the Boards inventory heavy investment should be fixed by the control co-ordinating Authority of the Boards, namely, Central Water and Power Commission Power wing at the time of giving clearance for such projects, and the Boards should make every effort to complete the same according to the time schedule fixed by introducing techniques available in this regard such as PERT CPM etc.

2) Control Over Inventories:
The Board should make an all out effort to minimise the inventories so as to avoid unnecessary blocking up of capital by the application of the technique of ABC analysis.
3) Control over generation, operation and maintenance expenditure. Suitable norms in respect of auxiliary consumption, Transmission and Distribution losses as well as the over all cost of Generation, Operation and Maintenance should be fixed and the actuals controlled against the same by introducing, if necessary, suitable incentive plans in this regard.

4) Speeding up of the realisation of Revenue. The Board should introduce an effective and a vigorous drive for the early realisation of the revenue so as to avoid the unnecessary blocking up of the capital in this regard.

5) Statutory maintenance of Cost Records and Cost Audit under Section 233B of the Companies Act, 1956. The Government of India should take immediate action for ordering the statutory maintenance of cost records by the Boards and Cost Audit under Section 233 B of the companies Act, 1956. Pilferage and theft constitute a major part of leakage and results in substantial loss to the State Electricity Board. By fixing norms for standard losses, accountability could be fixed on the staff of Board and the loop-holes plugged.
The study also indicates that the cost of electricity sold consumes major part of the revenue by electricity sold. Therefore, it is suggested that the cost of electricity sold should be reduced at various cost centres. As the Board is not having its own share capital, it has to be dependent on borrowed funds which results in heavy interest burden. This causes in increasing the non-operating expenses. Therefore, the Boards should have their own equity capital in order to reduce the interest liability.

The rate of return on capital employed should be increased by way of commensurate increase in the tariff and proper utilisation of borrowed funds. Debtor turnover ratio shows inefficiency of the Board in collecting the dues from the customers in the last phase of the study. Debtor’s turnover should be increased by way of charging interest at the prevailing rate for delay in payment.