A B S T R A C T

A STUDY OF THE CAPITAL BUDGETING PROCESS IN THE

INDIAN RAILWAYS

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The Indian Railways is the nation's largest public sector undertaking. The Railways are a capital intensive industry and their economic viability depends to a large extent on the productivity of its capital inputs. Since 1950-51 the rate of return obtained by the Railways on the capital contributed by the Central Government has been well below the required rate of return which is 6.75%.

The objective of the present study is to understand the different elements of the capital budgeting process in the Indian Railways, to identify the weaknesses, if any, in the process, and to suggest improvements. Considering the geographical spread of the Indian Railway Network, the magnitude of capital investments, and the diverse nature of capital investments in the Railways, it is scarcely conceivable that a single research study can adequately cover the entire gamut of activities comprising the capital budgeting process of the Railways. The present study is therefore confined to the two most important types of capital investments in the Railways- new lines and gauge conversions.

The thesis has been organised into two parts. Part I contains a brief introduction (Chapter 1), a review of the capital budgeting literature (Chapter 2), and a review of the capital budgeting process in the Indian Railways (Chapter 3) and forms the background for analysing the capital budgeting process in the right perspective in order to isolate those aspects of the process in which a detailed enquiry need be conducted.

Part II contains a Chapter on the use of discriminant analysis in the search process (Chapter 4), In Chapter 5 and 6 (Part II) the critical parameters of the evaluation stage are identified using the techniques of analysis of variance (Chapter 5) and sensitivity analysis (Chapter 6). The effects on project viability of time overruns is studied in Chapter 7 (Part II) Appendix A demonstrates the use of a multiobjective technique, Electre IV, in modelling the project selection process in the Indian Railways.

Capital budgeting literature suggests, and the capital planning process in the Indian Railways confirms, the importance of the search process. The search process is one of the most important, yet most neglected, aspects of capital budgeting. In the first Chapter of Part II the technique of discriminant analysis is suggested as an aid for the search process. The results are encouraging and the use of the classification functions derived in Chapter 4 indicate zero misclassifications.

Literature on capital budgeting, in general, and on investment planning in the Railways, in particular, has been characterised by the totally disproportionate effort on developing techniques for evaluating investment projects. From a managerial viewpoint, an enquiry into systematic errors in actual forecasting practices would have a far higher value. Chapters 5 and 6 are steps in this direction. Critical factors at the macro-level, which could be causing systematic errors in the forecasting procedure, have been identified through the use of the statistical technique of analysis of variance in Chapter 5. In Chapter 6 sensitivity analysis is used to isolate critical parameters at the individual project evaluation stage.

Project cost and time overruns are a recurring feature on the Indian Railways. Though there are elaborate systems for cost control, no importance is placed on controlling time overruns. In Chapter 7 the effects of irrelevant factors have been eliminated

to arrive at a true picture of the effect of cost
and time overruns. The results are interesting
and indicate that time overruns have a larger im-
pact than cost overruns on project viability.

Literature on transport investment planning
suggests the existence of multiple, conflicting
objectives in transport investments. The results
of Chapters 4 and 5 confirm the existence of mul-
tiple, conflicting objectives in Indian Railways.
In Appendix A the multi-objective technique,
Electre IV, is used to model the project selection
process in the Indian Railways. The results are
encouraging and exhibit a remarkable degree of
consistency with the decisions actually arrived
at by the Railways.