

CAPITAL EXPENDITURE DECISION IN PRIVATE AND
PUBLIC SECTOR ENTERPRISES IN INDIA
A COMPARATIVE EVALUATION

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*Under the faculty of
Social Sciences*


By

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20 December 1996

CERTIFICATE

CERTIFIED THAT THIS THESIS " CAPITAL
EXPENDITURE DECISION IN PRIVATE AND PUBLIC
SECTOR ENTERPRISES IN INDIA - A COMPARATIVE
EVALUATION " IS THE BONAFIDE RECORD OF
RESEARCH CARRIED OUT BY SRI.E.C.JOSE UNDER
MY SUPERVISION. THE THESIS IS WORTH
SUBMITTING FOR THE DEGREE OF DOCTOR OF
PHILOSOPHY UNDER THE FACULTY OF SOCIAL
SCIENCES.


Dr.K.C.Sankaranarayanan



DECLARATION

I, E.C. JOSE, HEREBY DECLARE THAT THIS THESIS ENTITLED "CAPITAL EXPENDITURE DECISION IN PRIVATE AND PUBLIC SECTOR ENTERPRISES IN INDIA - A COMPARATIVE EVALUATION" IS THE RECORD OF THE BONAFIDE RESEARCH WORK CARRIED OUT BY ME UNDER THE SUPERVISION OF DR. K. C. SANKARANARAYANAN, DIRECTOR, SCHOOL OF SOCIAL SCIENCES AND PROFESSOR & HEAD OF THE DEPARTMENT OF APPLIED ECONOMICS, COCHIN UNIVERSITY OF SCIENCE AND TECHNOLOGY, COCHIN - 22

I FURTHER DECLARE THAT THIS RESEARCH WORK HAS NOT PREVIOUSLY FORMED THE BASIS FOR THE AWARD OF ANY DEGREE, DIPLOMA, ASSOCIATESHIP, FELLOWSHIP OR OTHER SIMILAR TITLE FOR RECOGNITION.

E. C. Jose
E.C. JOSE

South Kalamassary
20 December 1996

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LIST OF ABBREVIATIONS

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<u>S.No.</u>	<u>Abbreviation</u>	<u>Description</u>
1	ONGC	Oil And Natural Gas Commission
2	IFC	Industrial Finance Corporation
3	IMF	International Monetary Fund
4	PSU	Public Sector Unit
5	SAIL	Steel Authority of India
6	BHEL	Bharat Heavy Electricals Limited
7	PIB	Public Investment Board
8	SCOPE	Standing Committee on Public Sector Enterprises
9	BPE	Bureau of Public Enterprises
10	GNP	Gross National Product
11	GDP	Gross Domestic Product
12	CMIE	Centre for Monitoring Indian Economy
13	SEB	State Electricity Board
14	IDBI	Industrial Development Bank of India
15	BIFR	Board of Industrial and Financial Reconstruction
16	SICA	Sick Industrial Companies Act
17	MAPI	Machinery and Allied Products Institute
18	MAPIR	MAPI Rate
19	NAA	National Association of Accountant
20	DCF	Discounted Cash Flow

21	MRF	Madras Rubber Factory
22	ITC	Indian Tobacco Company
23	CAG	Comptroller and Auditor General
24	CPU	Committee on Public Undertaking
25	NITIE	National Institute on Training in Industrial Engineering
26	ICSSR	Indian Council for Social Science Research
27	FOB	Free On Board
28	ARR	Accounting Rate of Return
29	NPV	Net Present Value
30	ICICI	Industrial Credit and Investment Corporation of India
31	RFA	Request for Financial Approval
32	Viz,	"Videlicit"; namely
33	e.g,	"Exempli gratia"; for example
34	ibid	"ibidem"; in the same place
35	i.e,	"id est"; that is
36	op cit	"opere citato"; in the work cited
37	p., pp.	page, pages
38	Vs	"versus"; against

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CHAPTER - I

C H A P T E R - I

THE PROLOGUE

1.1 RELEVANCE OF THE STUDY

Patel and Nigam while writing about Pandit Jawaharlal Nehru's dream of creating a socialistic pattern of society through the public sector, very candidly admit that the performance of our public sector undertakings over the years has not been satisfactory. The country has got disillusioned by the poor return on the vast investment made in the public sector which amounts to a staggering figure of Rs.62,000 crores. The public sector in India did not lack talent, men of wisdom and drive. Possessing ripened, experienced technocrats and administrators of the highest order, if they could not show their best, as some of their counterparts abroad did, Swaminathan, ex-CMD of Minerals and Metal Trading Corporation while writing a foreword to the book WE AND THE PUBLIC SECTOR NEHRU'S GIFT TO THE NATION comments to the authors about an introspective question "To be or not to be"⁽¹⁾ regarding privatisation of public sector enterprises.

(1) S.M.Patel and Raj K.Nigam; We and the public sector - Nehru's gift to the Nation; Prentice Hall Publication, New Delhi. 1984.

In another situation, Norman R. Augustine, Chairman and Chief Executive Officer of Martin Maritta Corporation, wrote about his project experience of a new plant⁽²⁾ as

The new plant has had a 100% cost overrun and an eight month completion and now, six months after start up, it runs at less than half the capacity planned in the original design. The workforce is disgruntled after a series of production crises, the customers are increasingly impatient, the original project manager has been fixed and the plant manager is feeling shaky.

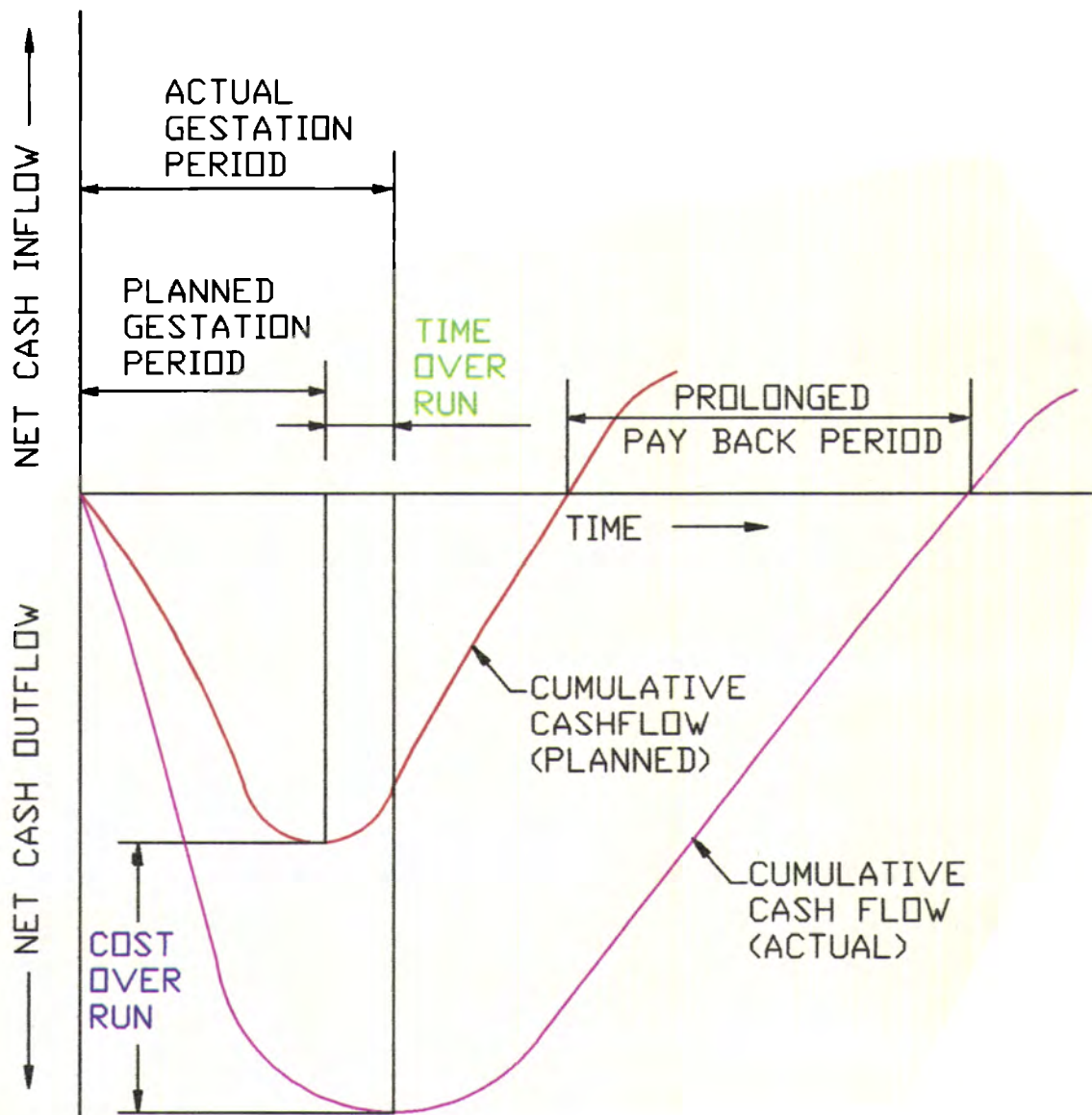
The time cost profile of a capital expenditure project is shown in Exhibit 1.1. It shows that when the planned gestation period gets extended by X units due to time overrun, the cost overrun is Y and the pay back period is prolonged or extended by Z.

Such situations, unfortunately, describe the fate of many new projects on capital expenditure whether it is in India or abroad. Capital expenditure overruns, delays and poor performance are symptoms of our widespread disease affecting many of the industries. Reports on new projects and capital expenditure support the general impression that estimate of their performance, time tables and costs are extraordinarily accident prone, particularly when they involve new technology. "In Britain, the disease has a name, the CONCORDE SYNDROME honouring supersonic air plane project that had overrun its estimated budget by several thousand percent" The name may differ, but the phenomenon

(2) Norman R Augustine; Managing Projects & Programmes
Harvard Business School Press. 1989. p.223.

EXHIBIT - 1.1

TIME COST PROFILE OF A CAPITAL EXPENDITURE PROJECT



is the same everywhere. Norman R Augustine continues to say⁽³⁾ "Attempts to save time and money on initial planning and definition, because of haste or lack of an adequately sized design department, or insufficient funds are always leading to disastrous ending"

The Exhibit 1.2 shows the variation in cost in relation to the variation in time of a typical capital expenditure project⁽⁴⁾

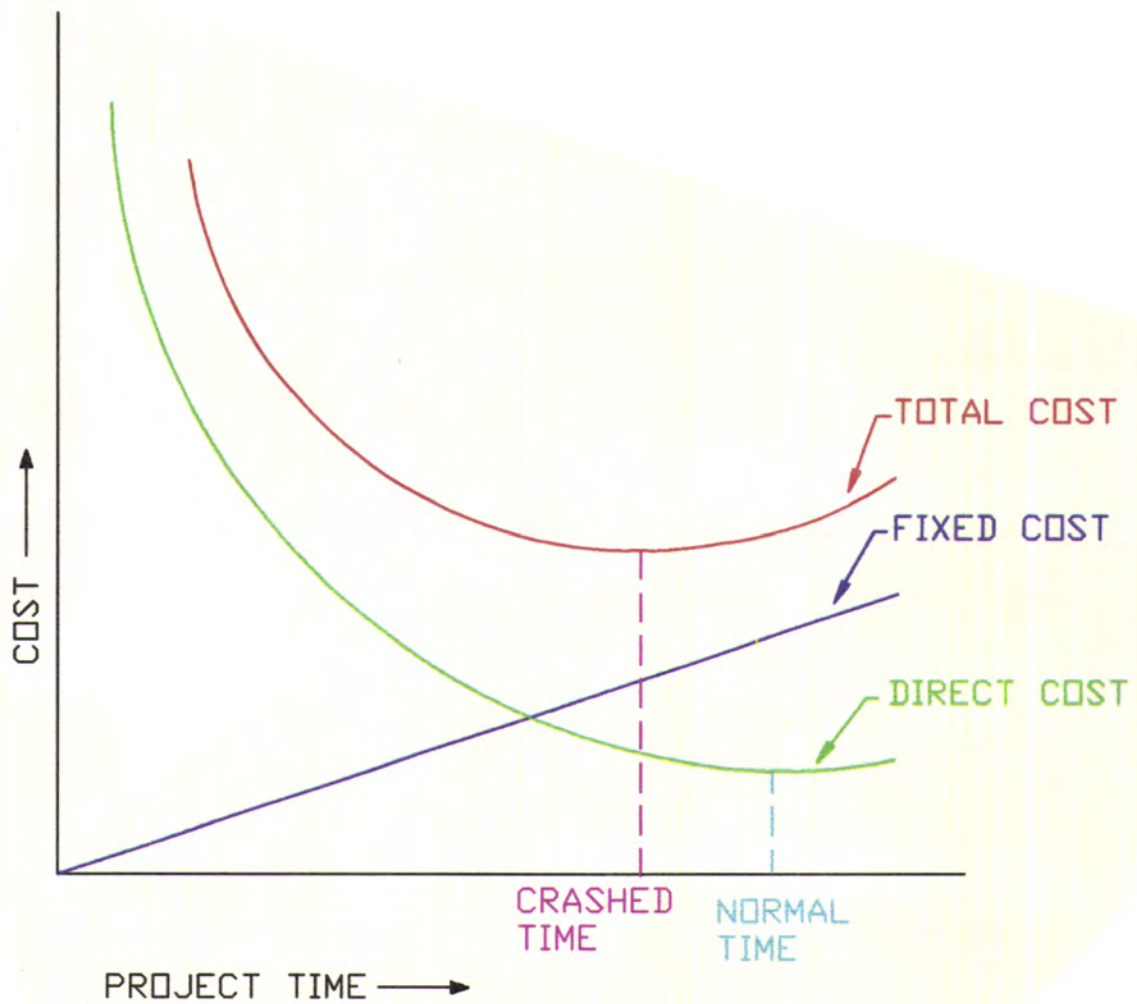
Any capital expenditure project has two cost components viz; fixed cost and direct cost or variable cost. Fixed costs are establishment charges, salaries of executives etc. Direct costs are the direct labour and material cost for the project. A particular time is required to get a job done by the available workforce. The optimum time for getting the materials and the job done is the normal time. This normal time can be crashed by allocating overtime for the workforce or getting additional workforce by paying more and also by procuring the necessary materials quickly by paying premium price. In other words, if we reduce the time from normal to crashed time, direct cost or variable cost will go up as shown in the exhibit. Similarly, if the project time is delayed beyond the normal time, the direct cost (called as variable cost also) will be minimum at the normal time and the direct cost will go up if the time is delayed beyond the normal time. But the fixed cost is directly

(3) *ibid.* p.224

(4) *ibid.* p.253

EXHIBIT - 1.2

COST VARIATION OF A TYPICAL
CAPITAL EXPENDITURE PROJECT



proportional to the time of the project. Longer the project time, more will be the cost. The time leading to the minimum cost is the optimum time of the project.

This shows that the cost and time of a project, whether it is a green field project or a capital expenditure project are closely inter-related. Any increase in time for completion invariably leads to an increase in cost and hence, the viability of the expenditure is questioned.

Analysing the economic situation, it was cited in news paper⁽⁵⁾ that cost overrun of major infrastructural projects slipped during 1990-91 was Rs.15,812 crores. Out of the 92 major projects in the pipeline, as many as 48 are slipping. The status report of these projects indicate that slippages range between few months to 72 months. Slippages are massive in fertilizer and power sector. Table 1.1 shows the cost and time overrun of projects. From the table it is found that the estimate of cost escalation is 32.6%.

It is reported in the Annual Report of the Department of Public Enterprises placed in Parliament on 5 August 1991 that the Central Public Sector Enterprises registered a marked decline in profit earnings in 1990-91. The report⁽⁶⁾ says that the 189 enterprises, earned only a net profit of Rs.2230.27 crores during 1990-91 against a net profit of

(5) The Indian Express

20 May 1991.

(6) The Indian Express

7 August 1991.

TABLE 1.1COST AND TIME OVERRUN OF THE PROJECTS

Sector	No. of Projects	Latest approved Cost	Proj.with cost overrun			Proj. with time over- run
			No.	Anticipa- ted cost	% Increase	
		(Rs.Crores)	(Rs.Crores)			
Atomic Energy	06	1716.4	4	2253.8	31.3	02
Civil Aviation	03	2197.1	2	2514.3	14.4	0
Coal	71	6184.7	44	8807.1	42.4	42
Fertiliser	07	1175.9	7	1917.1	63.0	07
Mines	03	3024.7	3	3156.8	4.4	01
Steel & Iron Ore	11	13899.2	10	15400.3	10.8	07
Chem.& Petro- chem	06	109.2	02	161.2	47.6	04
Petro & Natural Gas	27	1303.5	05	1564.9	20.1	21
Power	48	11186.9	29	17398.1	55.5	31
Paper, Cement & Auto	12	753.5	06	1013.6	34.5	06
Railways	89	4706.0	53	7197.1	52.9	16
Surface Transport	31	979.5	17	1262.0	28.8	19
Telecommuni- cation	<u>17</u>	<u>239.0</u>	<u>02</u>	<u>286.9</u>	<u>20.1</u>	<u>07</u>
TOTAL	331	47475.6	184	62933.1	32.6	163
	===	=====	=====	=====	=====	=====

SOURCE CMIE

Rs.3,248 crores earned by them during 1989-90. This shows a decline of Rs.1017 73 crores (37.28 percent) Out of the total 233 enterprises, 12 enterprises have shown an increase in profitability or decrease in losses by Rs.20 crores or more during 1990-91 compared to the previous year. They are:-

- 1) Indian Railway Finance Corporation
- 2) National Thermal Power Corporation
- 3) South Eastern Coalfields Limited
- 4) Engineering Projects India Limited
- 5) Indian Oil Corporation
- 6) Power Finance Corporation
- 7) Kundremukh Iron Ore Company Limited
- 8) Pawan Hans Limited
- 9) Cement Corporation of India Limited
- 10) Rural Electrification Limited
- 11) Minerals and Metals Trading Corporation, and
- 12) Northern Coalfields Limited

On the other hand, 15 enterprises have shown deterioration in their profitability or increase in losses by more than Rs.20 crores. They are:-

- 1) O N G C
- 2) Bharat Coking Coal Limited
- 3) Eastern Coalfields Limited
- 4) National Aluminium Company Limited
- 5) Hindustan Petroleum Corporation
- 6) Hindustan Fertilizer Corporation
- 7) Hindustan Engineering Corporation
- 8) Bharat Heavy Electricals Limited
- 9) Oil India Limited

- 10) Indian Petrochemical Corporation
- 11) Videsh Sanchar Nigam Limited
- 12) Coal India Limited
- 13) Mining and Allied Machinery Corporation
- 14) Steel Authority of India Limited
- 15) Indian Airlines

A sector-wise analysis indicates that the Petroleum Sector leads among the profit making sectors, with a net profit of Rs.2,275 crores earned during 1990-91 compared with Rs.2,896 crores earned during the previous year. It is followed by Power Rs.666.01 crores, Financial Service Rs.281.14 crores, Minerals and Metals Rs.196.98 crores, Telecommunication Services Rs.179.43 crores and Trading and Marketing Rs.164.55 crores. Among the loss making sectors, the Fertilizer sector continues to head the list with Rs.355.94 crores followed by Consumer goods Rs.211.74 crores, Textiles Rs.193 crores and Contracts and Construction Rs.116.12 crores.

Krishnamurthy, former Chief Executive of BHEL, Maruti Udyog and SAIL has expressed the view ⁽⁷⁾ that generally the image of public sector is not good. There is a feeling that the public sector can contribute a lot more than it has. Also, the benefits from these enterprises have not been commensurate with the investments made in terms of both financial and human resources.

(7) The Sunday Times Of India

11 August 1991.

The number of sick units in the country has gone up seven times since 1980, blocking capital worth of Rs.30,000 crores and endangering two million jobs, cited Khandwala, Professor of Organisational Behaviour of the Indian Institute of Management, Ahmedabad⁽⁸⁾ He, while speaking on the "Dynamics of Corporate Regeneration", revealed that over 40 percent of Central Government Enterprises were making losses. He also pointed out that the incidence of sickness in the public sector has doubled, going up to Rs.38,400 crores in 1987 from Rs. 18,200 crores in 1979. According to him, no amount of financial aid or government action could help unless the management of sick units had been improved.

Jhaveri, former Deputy Managing Director of ICICI in an article entitled "Privatisation - Nuts & Bolts Issue"⁽⁹⁾ showed that Public Sector Enterprises' return on capital employed is very low. As a percentage of capital employed, net profits declined from 4.62 in 1989-90 to 2.66 in 1990-91. In comparison with this, an ICICI sample of 417 private sector companies shows a profit after tax of 10.6 percent.

The growth achieved by Indian Private Sector Companies was substantially in excess of the overall economic growth. The assets of Indian companies grew at an average rate of

(8) The Indian Express
15 September 1991.

(9) The Economic Times
24 September 1991.

22.1 percent and sales by 18.3 percent, well above the inflation rate of 7.9% during the period 1980-88 as published by IFC. This was revealed in a study conducted by the IFC on 50 large (in terms of assets) manufacturing companies listed on the stock market in India and seven other countries. However, in view of different accounting conventions, comparisons of corporate profitability were difficult among the eight countries covered by the study. But, the study reveals that Indian and Korean firms were the most intensive users of long term debts.

The following is the list of chronically sick public sector companies presented to Rajya Sabha⁽¹⁰⁾ on 28 November 1991:-

STEEL

Indian Iron and Steel Company Limited

MINERALS & METALS

Bharat Gold Mines Limited

FERTILIZER

- 1) Fertilizer Corporation of India Limited
- 2) Hindustan Fertiliser Corporation Limited

CHEMICALS & PHARAMACEUTICALS

- 1) Bengal Chemicals and Pharamaceuticals Ltd,
- 2) Bengal Immunity Limited
- 3) Hindustan Fluorocarbons Limited
- 4) Indian Drugs and Pharamaceuticals Limited
- 5) Maharashtra Antibiotics and Pharmaceuticals Ltd,

(10) The Economic Times

2 December 1991.

- 6) Orissa Drugs and Pharmaceuticals Limited
- 7) Smith Stanistreet and Pharmaceuticals Limited
- 8) Southern Pesticides Corporation Limited

HEAVY ENGINEERING

- 1) Bharat Process and Mechanical Engineers Limited
- 2) Braithwaite and Co. Limited
- 3) Burn Standard Company Limited
- 4) Mining and Allied Machinery Corporation Limited
- 5) Triveni Structural Limited
- 6) Weighbird (India) Limited

MEDIUM & LIGHT ENGINEERING

- 1) Bharat Brakes and Valves Limited
- 2) Bharat Pumps and Compressors Limited
- 3) Biecco Lawrie Limited
- 4) National Instruments Limited
- 5) Richardson and Cruddas (1972) Limited
- 6) Vignyan Industries Limited

TRANSPORTATION EQUIPMENTS

- 1) Cochin Shipyard Limited
- 2) Cycle Corporation of India
- 3) Hindustan Shipyard Limited
- 4) Hoogly Dock and Port Engineers Limited
- 5) National Bicycle Corporation of India
- 6) Scooter India Limited

CONSUMER GOODS

- 1) Bharat Ophthalmic Glass Limited
- 2) Birds, Jute and Exports Limited
- 3) Hoogly Printing Company Limited
- 4) Mandya National Paper Mills Limited
- 5) Nagaland Pulp and Paper Mills Limited
- 6) National Jute Manufactures Corporation Limited

- 7) Rehabilitation Industries Corporation Limited
- 8) Tannery and Footware Corporation of India Limited
- 9) Tyre Corporation of India Limited

TEXTILES

- 1) British India Corporation Limited
- 2) Cawnpore Textiles Limited
- 3) Elain Mills Company Limited

Unless we start thinking very seriously and act quickly, no World Bank or IMF loan can prevent the above list from getting lengthened and lengthened.

In comparison to this, it is reported⁽¹¹⁾ that 300 giant private sector companies recorded an increase of 15.2 percent of gross sales (16.3 percent in net sales) and 25.8 percent in gross profit. Also, an expansion of 18.9 percent was evident in the total capital employed, the net worth of the companies has increased by 26.7 percent during 1990-91.

It is also pointed out⁽¹²⁾ that 96 railway projects have registered steep cost and time overruns in 1992. Out of these about 10 doubling and new line projects have registered a cost over run of nearly 54 percent. Twentytwo projects have reported time delays ranging from 1 to 21 months in the first six months of the 1991-92 financial

(11) The Economic Times

5 December 1991.

(12) The Economic Times

14 March 1992.

year. Thirty seven projects registered delay ranging from 3 months to 60 months. The original cost estimates of the 96 projects were Rs.9850.7 crores, the revised costs till September 1991 were Rs.11,899.5 crores showing an increase of 24.2 percent over the original estimates. Sneh Lata Bhatia reported that the major reasons for the delay in the execution of projects are fund constraints, indiscriminate approval to new line projects under political pressure, land acquisition and failure to update technology. The induction of modern technology for coach manufacturing at Kapurthala has been delayed by four years. The factory which began operations in 1988 manufactures coaches based on the design of 1960's and above all there is no priority fixation for projects.

With reference to private sector it is reported⁽¹³⁾ that Tisco's net profit is up at Rs.214 crores. The directors have proposed to step up the equity dividend to 35 percent from 31 percent paid for the previous year. The company's sales and other income increased by 24 percent to Rs.2,895 crores. The capital expenditure during 1991-92 was a record of Rs.1,330 crores. The company's multithousand crore modernisation programme phase - III and certain important supporting facilities under the rolling programme are in an advanced stage of implementation. While the new 500 tonnes per day Oxygen Plant was commissioned in March 1992, certain major facilities such as one million tonne Blast Furnace, the rebuilt Coke Oven Battery No.6 and the

(13) The Economic Times

29 May 1992.

one MPTA Hot Strip Mill are scheduled for commissioning during 1992-93 apart from the new Cement Project with 1.73 MTPA capacity and the expansion project at the Bearing Plant, Kharagpur to 10 million numbers per annum.

K.Gupta, a Bombay based consultant, commented⁽¹⁴⁾ that from Rs.55 crores in the First Plan to Rs.40,000 crores in the seventh plan expenditure for the development of the core industries in the public sector has seen phenomenal growth. Since the number of new companies in the public sector stable has not shown a commensurate jump, it can be assumed that much of this investment has been used for modernisation and expansion. And as is so often the case, many projects of public sector undertakings swallow much larger funds than they were budgeted to. The logical solution would be to delink from investment in the public sector to profitability. If PSU's cannot generate capital for future growth on their own, they should be left to stagnate. If the Government has extra funds in its kitty, it can always invest in a new company which will definitely lead to some additional production and employment rather than modernisation of existing units which has no guarantee of additional production and hence increased return.

John Kenneth Galbraith, Emerites Professor of Economics at Harvard University wrote⁽¹⁵⁾ that the code word in much

(14) Business World

June 8 21, 1992.

(15) Business India

May 13 26, 1991.

intense discussion was nationalisation or socialisation. Large powerful and often monopolistic enterprises were prominent on the industrial scene. Any discussion today about takeover or nationalisation would have been a marked flavour of antiquity, the economic and political equivalent, more or less, of the resurrection of the titanic or the recreation in New York's central park of the caves and paintings of Lascaux. All mention is now of privatisation in Central Europe, Soviet Union, Latin America and to say all English speaking countries. Table 1.2 shows the number of privatised firms around the world.

Pranab Mukherjee, the then Deputy Chairman of the Planning Commission and External Affairs Minister, wrote⁽¹⁶⁾ that the public sector undertakings should maximise their efficiency, taking a lesson from their inefficiency. He is of the opinion that the growth of stock exchange transactions from a mere Rs.20 crores in early fifties to the projected figure of Rs.27,000 crores at the the 8th plan is an indication of the growth of the private sector. He holds the view that disinvestments of public sectors are to be done very carefully. More autonomy is to be given to the public sector in its day-to-day working. That is the only way to streamline and strengthen the public sector.

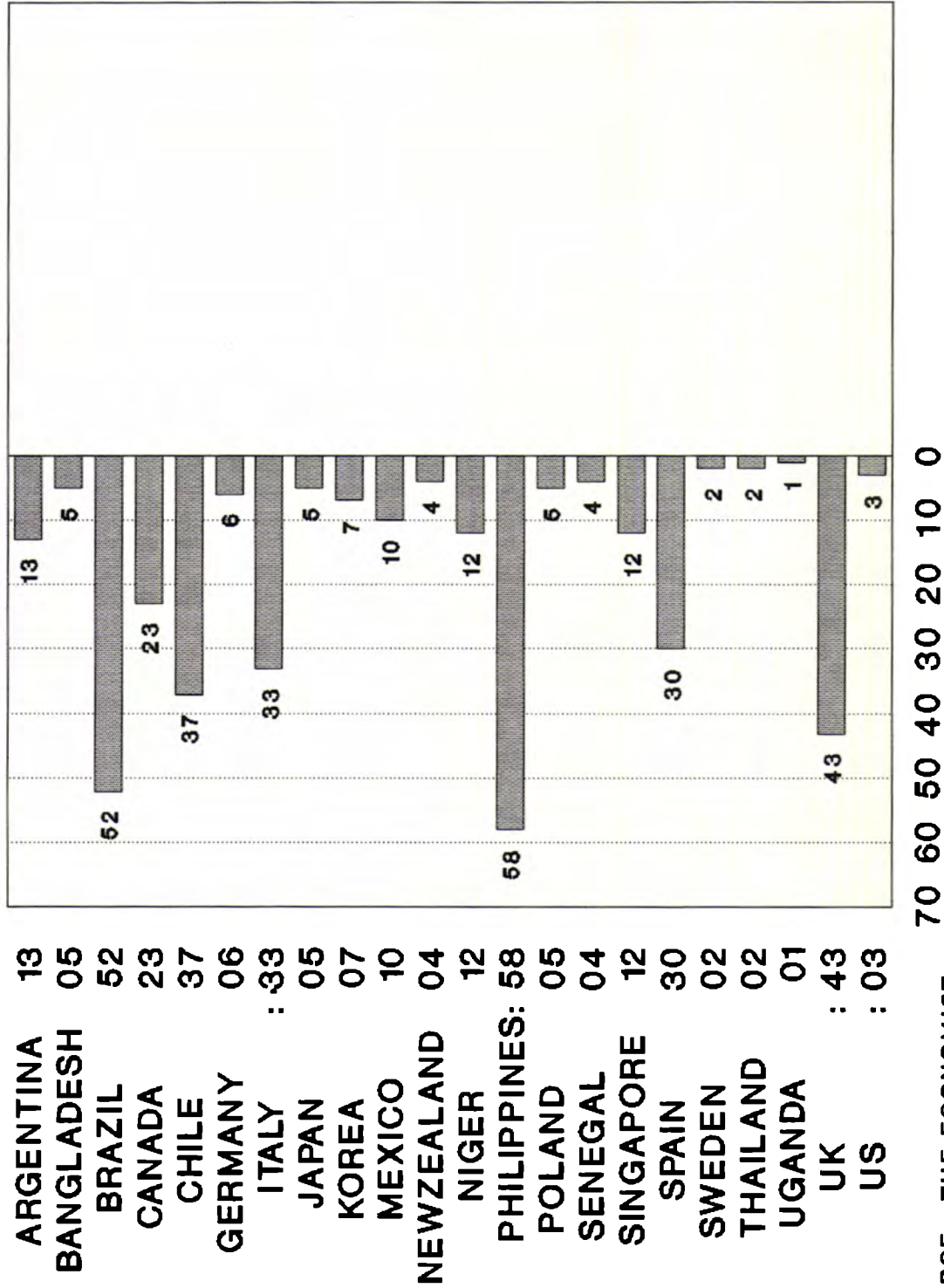
Ashok Upadhyay and Anjan Ray wrote⁽¹⁷⁾ that with

(16) Business India

May 6 - 19, 1996. p.59

(17) ibid. p.63

TABLE - 1.2
NUMBER OF PRIVATISED FIRMS AROUND THE WORLD



SOURCE THE ECONOMIST

liberalisation the private sector has been freed from the rigours of the licence permit raj, the public sector (central) still continues in the grip of what could be described as an approval raj exercised by the parent ministry and other government agencies. Boards of public sector units have limited powers to approve capital expenditures even when the capital expenditure is funded through internal sources. Currently the limit is Rs.50 crores which is rather small for an organisation like SAIL or BHEL. Administrative Ministries in core sector such as steel, coal and power can approve capital investment upto Rs.100 crores. Capital investment beyond this limit has to go through a two stage approval process. In the first instance, the project is given an "in principle" approval from a committee of the public sector board. In the second stage, a detailed project report has to be prepared and approved by the PSU's Board of Directors and then sent to various Government departments including the planning commission, the Finance Ministry and other departments such as power and coal, if they are also involved. Finally the project proposal is again cleared by the PIB and then passed on to the Cabinet Committee of economic affairs for final approval. Even after this important contracts are reviewed by the parent ministry.

Hakeem, Secretary General, Standing Committee on Public Sector Enterprises (SCOPE) has suggested to reduce the umbilical link with Parliament as a means of giving more operational freedom for successful PSUs.

The Economic Survey of 1995-96 presented in Parliament on 19 July 1996 shows that overall economic growth for 1995-96 has come to a level of 7.0 against the estimate of 6.2 percent. Industrial growth came to a level of 12%. But India still continues to be the second largest recipient of loans from World Bank and International Development Agencies. India has received a total of US \$ 2.0777 billion during the financial year 1996 ending June 30.

Details of countries who have taken loans from World Bank are shown⁽¹⁸⁾ in Table 1.3.

I.M.D.Little and J.A.Mirrlees of Oxford University had written⁽¹⁹⁾ that:-

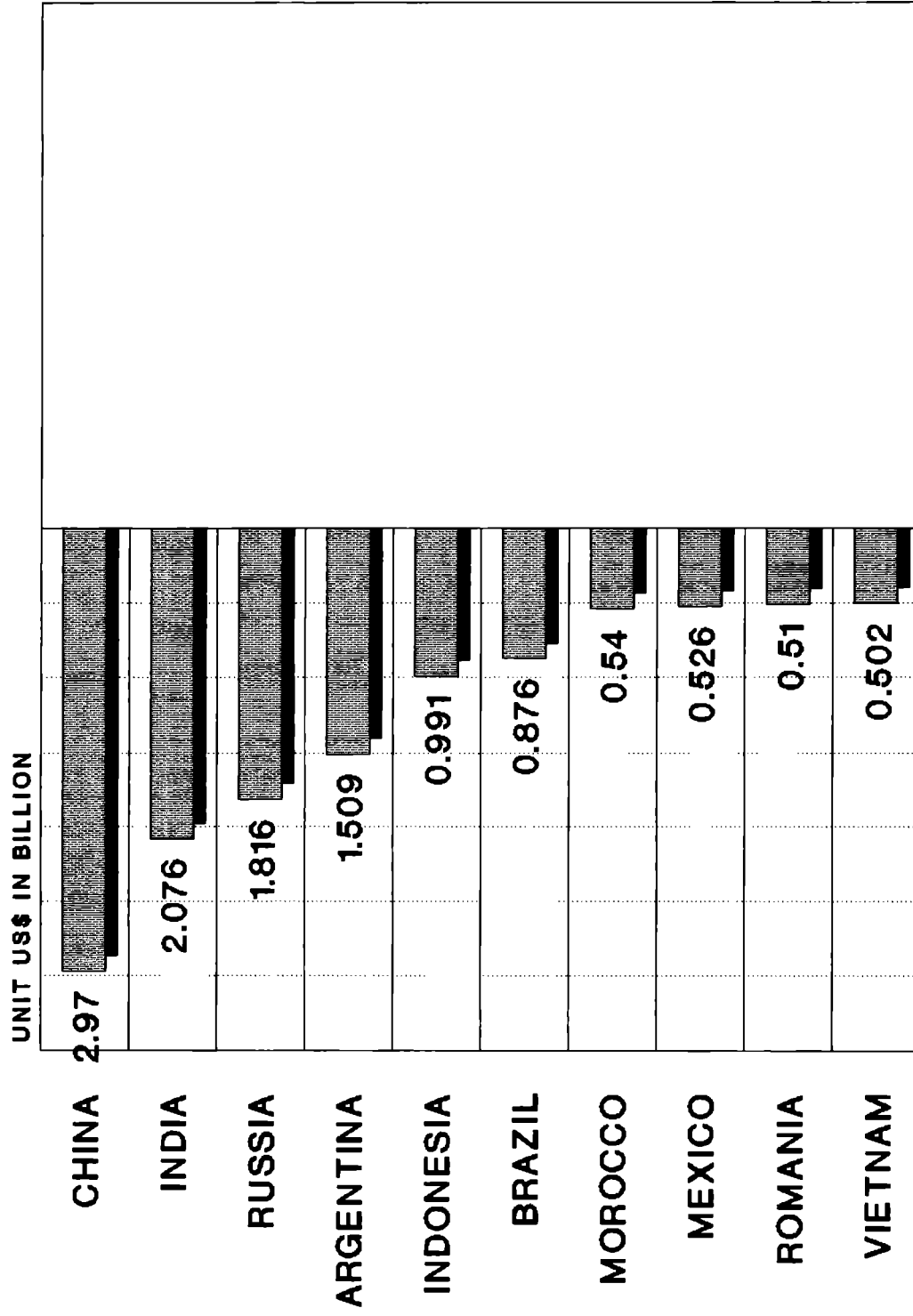
- 1) We have not discovered any rational approach to project selection in public sector in India.
- 2) There seems to be quite insufficient cost consciousness. This goes for the choice of the projects, the design of projects and also the running of the projects.
- 3) Insufficient thought seems to have been given to management problems.
- 4) Heavy damage is caused to the economy by delays in construction and changes in design. This is far greater than the mere increase in capital cost.

(18) The Economic Times

8 August 1996.

(19) Little I.M.D. and Mirrlees J.A.; Project appraisal and Planning for Developing Countries; Oxford & IBA Publishing Company; New Delhi. 1977. p.81

TABLE - 1-3
**WORLD BANK LOAN TO DEVELOPING COUNTRIES
 FOR THE FISCAL YEAR 1996 (ENDING BY 30 JUNE '96)**



SOURCE : WORLD BANK REPORTS
 TOTAL WORLD BANK LOAN DURING THIS FISCAL YEAR 1996 - US\$ 21.4B

Besant C. Raj writes that (20) "In laying down realistic targets and time schedules for completion of construction, commencement of production; delays in both of which have damaged the image of the public sector undertakings unnecessarily" Even though two companies are producing the same product and the quantity of sales is the same, profit varies mainly by engineering the finance functions. But he holds the view⁽²¹⁾ that "None of the finance managers have an understanding of the recent developments in capital budgeting techniques" He also points out that clearly defined organisational set ups are not available at plant level for capital budgeting decisions.

In the ultimate analysis, all decisions with regard to the public enterprises, particularly major investment decisions, need the approval of Parliament. After a proposal has been approved by the administrative ministry and also has the concurrence of the Finance Ministry, the proposal is included in the budget demand of the administrative ministry concerned and submitted to Parliament for approval. The prevailing practice is to give details regarding the capital outlay, objects and achievements of the enterprise in the publication entitled "**Notes on Important Schemes**" appended to each volume of the demands of grants. In the case of new undertakings to be

(20) Besant C.Raj; Public Enterprise Investment Decisions In India; Macmillan Company of India ltd.,; New Delhi. 1977 p.62

(21) *ibid.* p.66

floated by administrative ministries, these details are given along with their supplementary demands or grants. Parliament usually spends very little time on discussion on demands of grants of individual ministries. Table 1.4 gives an indication of the time allotted to Finance Business, particularly with regard to budget grants by the Parliament (22)

It can be seen from the table that Parliament spends less than 10 hours on the demands made by any one ministry. Each ministry consists of numerous departments and each department looks after a series of affairs. In view of very limited time available to Parliament for examining the budgets of each ministry, it seems probable that the new projects are approved without much scrutiny. A proposal once approved by Parliament and once construction has commenced, will be continued irrespective of total final cost.

Table 1.5 shows the original cost indicated in the original proposals submitted to Parliament and the actual cost incurred.

It will be noticed that increase in project cost has ranged a very wide margin in some cases by as much as 80 percent of the original estimates. For getting a proposal approved, the promoters of the project have to overcome many obstacles. In spite of such scrutinies, checks and counter checks, the project costs have not only varied by a

(22) *ibid.* p.102

TABLE 1.4**ALLOCATION OF PARLIAMENT TIME TO FINANCIAL BUSINESS**

	<u>HOURS SPENT</u>
Demand for budget grants in respect of Ministry of :-	
1) Commerce and Industry	7
2) Community Development and Cooperation	8
3) Defence	6
4) Education	5
5) External Affairs	6
6) Finance (including Planning)	8
7) Food and Agriculture	8
8) Health	5
9) Home Affairs	8
10) Information & Broadcasting	4
11) Irrigation and Power	6
12) Labour and Employment	6
13) Law	5
14) Rehabilitation	4
15) Scientific Research and Cultural Affairs	3
16) Steel, Mines and Fuel	8
17) Transport and Communication	8
18) Works, Housing and Supply	4
19) Department of Atomic Energy	1

SOURCE: Wattal, P.K., Parliamentary Financial Control in India, Bombay and Simla, Minerva Book Shop, 1962, P.323

TABLE 1.5
ESTIMATED AND ACTUAL COSTS OF PROJECTS

<u>Sl. No.</u>	<u>Name of the Undertakings</u>	<u>Original estimate</u> (Rs.Crores)	<u>Actual</u> (Rs.crores)	<u>Percentage increase</u>
1)	Durgapur Steel Plant	115.00	205.25	78
2)	Rourkela Steel Plant	128.00	230.48	80
3)	Bhilai Steel Plant	110.00	202.34	83
4)	Hindustan Teleprinters	1.5	1.65	10
5)	Gauhati Refinery	13.06	14.51	11
6)	Hindustan Antibiotics:-			
	a) Pimpri Unit	1.15	1.59	38
	b) Streptomycin Unit	1.73	2.08	20
7)	Hindustan Photo Films Mfg.Co. Limited	7.38	8.53	15.5
8)	National & Mineral Development Corpn.Ltd., (Kiriburu Iron Ore Proj)	9.06	11.22	24
9)	Hindustan Machine Tools Ltd. (Watch Factory)	2.50	3.68	47
10)	Fertilizer Corporation of India Ltd:-			
	a) Trombay Unit	24.34	33.40	37
	b) Nangal Unit	20.90	31.20	49
11)	Heavy Electricals Ltd., Bhopal	35.25	49.3	39
12)	Heavy Engineering Corporation Limited.	125.97	206.5	64

SOURCE: Committee on Public Undertakings (Third Lok Sabha), Thirteenth Report - Management and Administration of Public Undertakings (Planning of Projects), New Delhi, 1963, P.55

wide margin, but also the performance of the undertakings when on stream have been found to be very unsatisfactory and very much below the anticipated projections made in the project reports. This shows that while the administrators and policy makers have evolved procedures and methods for examining and scrutinising proposals, their evaluations have been ineffective. Having accepted a project and having committed themselves to huge expenditures, the authorities who scrutinised project proposals have no way of saying "No" to the project authorities regarding further expenditures. In other words, the project evaluators who appear to be powerful, are in fact, at the mercy of the promoters of the public enterprises. When the project authorities request for further allotment of funds to complete the project, the alternative available to the finance ministry is to sanction further funds to complete the project or to abandon the project on which crores of public money has already been spent. Invariably the ministry will have to make more and more funds available till such time as the project is completed. In the meanwhile, various explanations and rationalisations will be made to cover up the acts of omissions and commissions in the decision making process. As numerous agencies and persons are involved and some of the persons who took decisions have already been transferred to elsewhere, it is not possible under the present system to ascertain individual responsibilities or to isolate any one agency. While everybody has powers in the decision making, no one can be held responsible for the decision made. The present organisation for capital expenditure, decision making and the time consuming, cumbersome, expensive procedures laid

out for the preparation of the feasibility studies, licensing, foreign investment approval, import regulation and preparation & approval of detailed project report are all mostly futile.

Baveja, the then Secretary, Ministry of Finance, Department of Expenditure, writes in his foreward to "Project Management - in Public Enterprises" - Proceedings of National Workshop, organised by Bureau of Public Enterprises (BPE) and Standing Conference of Public Enterprises (SCOPE) in 1983 that nearly Rs.22,000 crores had been invested in more than 200 public sector enterprises under the Central Government. The Sixth Plan envisages a public sector outlay of Rs.97,500 crores at 1979-80 prices. He writes that this massive and progressively increasing investment in the public sector enterprises as well as the size and complexity of their project have necessitated the imperative need of devising system and procedures for project selection, project appraisal and approval of investment proposals. Absence of these systems has been the major factor contributing to serious cost and time over runs for the projects under construction. Such cost and time over runs not only affect the performance of the enterprises concerned, but also lead to delays in delivering the goods to the nation, both in terms of production as well as in terms of financial return.

The investments undertaken in Public Enterprises can be classified into six categories on the basis of essentiality and usefulness to various segments of the society⁽²³⁾ Those investments considered essential to the nation as a whole, should yield the social discount rate. Those projects which are desirable (though not essential) should yield the social opportunity cost of capital and those for pleasure and enjoyment and those which would be consumed basically by the wealthier classes of the society should yield the market rate of return in the private industry. Table 1.6 indicates the returns required based on the six - fold classifications⁽²⁴⁾

Using the framework for investment analysis, it is possible to analyse a project from the point of view of the enterprise as well as from the point of view of the economy. But to our dismay, it can be noted that none of the public sector industrial investment proposals are evaluated based on the above principles.

Table 1.7 shows⁽²⁵⁾ the investments in public sector and private sector planned during our five year plans. If the investments made in the public sector are not yielding a reasonable return the country will continue to get more

(23) *ibid.* p.211

(24) *ibid.* p.212

(25) A.N.Agrawal, H.O.Varma and B.C.Gupta; India - Economic Year Book - 1995; National Publishing House, New Delhi. 1995. p.319

TABLE 1.6REQUIRED RATE OF RETURN FOR PUBLIC INDUSTRIAL INVESTMENT

<u>Sl. No.</u>	<u>Industry Group</u>	<u>Basic Objective</u>	<u>Required Return</u>
1)	Basic consumption products.	Increase per capita consumption.	Social discount rate or less.
2)	Social Overhead	Increase quality and longevity of life.	Social discount rate.
3)	Defence	Protection of national sovereignty and way of life.	-do-
4)	Light and Medium Industries.	Increase consumption and improve standards of living.	Opportunity Cost of capital to the economy.
5)	Basic and Heavy Industries	Promote further industrialisation.	-do-
6)	Luxury goods	Pleasure, enjoyment status symbol.	Market rate of return on investment.

SOURCE: Besant C.Raj, Public Enterprise Investment Decisions in India,
Macmillan Company of India Limited, New Delhi, 1977, P.62

TABLE 1.7
INVESTMENT - PUBLIC AND PRIVATE SECTOR

PLAN	INVESTMENT (RS.CRORES)			INV. % DISTRIBUTION	
	PUBLIC	PRIVATE	TOTAL	PUBLIC	PRIVATE
First Plan (1951-56)	1,560	1,800	3,360	46.4	53.6
Second Plan (1956-61)	3,731	3,100	6,831	54.6	45.4
Third Plan (1961-66)	6,300	4,100	10,400	60.6	39.4
Annual Plans (1966-69)	-	-	-	-	-
Fourth Plan (1969-74)	13,655	8,980	22,635	60.3	39.7
Fifth Plan (1974-79)	36,703	27,048	63,751	43.3	56.7
Sixth Plan (1980-85)	84,000	74,710	158,710	47.8	52.2
Seventh Plan (1985-90)	154,218	168,548	322,766	45.7	54.3
Eighth Plan (1992-97)	361,000	437,000	798,000	45.2	54.8

SOURCE: Plan Documents

NOTE: Figures for the Eighth Plan relate to plan provisions.

loans from World Bank and International Development Agencies, and one day India will be a prey to the "death trap"

Table 1.8 gives⁽²⁶⁾ information regarding the number of employees working in public sector organisations. This shows that the success of public sector is the success of 1,92,94,000 employees and hence the success of Indian population. If it is a failure, it can be easily understood how severely it will hit back our Indian Economy and hence our whole country.

The gross national product (GNP) shown in Table 1.9 presents⁽²⁷⁾ a comparison of India and other developing countries. It is clear from the table that the development already achieved by India is meagre and India has to go a long way to become a developed nation. Our neighbouring countries like Pakistan, Indonesia etc., are also having higher GNP compared to India. Only two countries, Bangladesh and Nigeria are lower in GNP compared to India.

(26) *ibid.* p.103

(27) P.K.Joy; Total Project Management - The Indian Context; MacMillan India Limited, New Delhi.
1993. p.2

TABLE 1.8**EMPLOYMENT IN PUBLIC SECTOR**

<u>YEAR</u>	<u>CENTRAL GOVERNMENT</u>	<u>STATE GOVERNMENT</u>	<u>QUASI GOVT.</u>	<u>LOCAL BODIES</u>	<u>('000) TOTAL</u>
1961	2,163	3,057	860	1,240	7,320
1966	2,676	3,741	1,374	1,751	9,542
1971	2,836	4,217	2,137	1,908	11,098
1976	3,047	4,897	3,392	1,985	13,322
1981	3,195	5,676	4,576	2,037	15,484
1984	3,311	6,154	5,274	2,130	16,869
1985	3,329	6,280	5,496	2,164	17,219
1986	3,346	6,473	5,674	2,190	17,683
1987	3,350	6,666	5,795	2,214	18,025
1988	3,381	6,781	5,948	2,211	18,320
1989	3,395	6,829	5,999	2,238	18,444
1990	3,397	6,979	6,173	2,223	18,722
1991	3,410	7,112	6,222	2,313	19,057
1992	3,456	7,119	6,269	2,366	19,210
1993	3,508	7,136	6,290	2,392	19,326
1994	3,554	7,158	6,342	2,391	19,445
1995	3,463	7,134	6,305	2,392	19,294

SOURCE: Government of India, Economic Survey : 1993-94 and Ministry of Labour

TABLE 1.9INDIA'S PER CAPITA GNP ALONG WITH OTHER COUNTRIES AS OF 1990

<u>COUNTRY</u>	<u>GNP IN US\$</u>
India	350
Australia	17,080
Canada	20,450
Japan	25,430
Switzerland	32,790
United States	21,700
Bangladesh	200
Indonesia	560
Rep.of Korea	5,400
Nigeria	270
Pakistan	380
Philippines	730

SOURCE: The World Bank Atlas 1991

Table 1.10 shows⁽²⁸⁾ the growth rate of Gross Domestic Product (GDP) of various developing countries. During the period 1965-80, countries like China, Bangladesh were having lesser growth rate of GDP than India. During the period 1980-90, Mexico and Brazil were also having lesser growth rate than India. Sri Lanka maintains the same growth rate of 4%. But it is clear that countries like China and Korea are far ahead of India.

The Centre for monitoring the Indian Economy (CMIE) has been making comparison of the financial performance of public sector enterprises with private sector companies, similar in nature. Covering the period from 1980-81 to 1989-90 and using the conventional concept of gross profit to capital employed, their analysis shows that inspite of the improvement in the ratio of gross profit to capital employed in the public sector in the second half of the 1980's compared to the first half, profitability remained much lower in the public sector than in the private sector. Table 1.11 shows⁽²⁹⁾ the comparison between public sector and private sector.

By all accounts, the financial performance of the state public sector undertakings was much worse than that of the central public sector enterprises. The heavy loss incurred by most (about 18) of the state electricity boards alone is

(28) Robert Cassen and Vijay Joshi; India - The Future of Economic Reforms; Oxford University Press, New Delhi. 1995. p.237

(29) *ibid.* p.242

TABLE 1.10GROWTH RATE OF GDP
(PER CENT PER ANNUM)

<u>COUNTRY</u>	<u>1965-80</u>	<u>1980-90</u>
Bangladesh	1.7	4.3
India	3.6	5.3
China	6.8	9.5
Pakistan	5.2	6.3
Sri Lanka	4.0	4.0
Indonesia	7.0	5.5
Thailand	7.3	5.6
Turkey	6.2	5.1
Chile	1.9	3.2
Mexico	6.5	1.0
Brazil	9.0	2.7
Korea	9.9	9.7

SOURCE: World Development Report - 1992

TABLE 1.11**COMPARISON OF PROFITABILITY : PUBLIC & PRIVATE
SECTOR ENTERPRISES**

	<u>GROSS PROFIT TO CAPITAL EMPLOYED</u>	
	<u>PRIVATE</u>	<u>PUBLIC</u>
1980-81	12.3	4.3
1981-82	11.2	6.5
1982-83	9.8	6.9
1983-84	9.4	6.0
1984-85	9.6	6.6
1985-86	9.5	6.6
1986-87	8.2	6.6
1987-88	8.1	6.2
1988-89	9.4	6.5
1989-90	11.3	6.5
1980-81 to 1984-85	10.5	6.1
1985-86 to 1989-90	9.3	6.5
1980-81 to 1989-90	9.9	8.3

SOURCE: Centre for Monitoring Indian Economy

estimated to be of the order of Rs.45.3 billion in 1991-92 which amount to 14.1% of the total anticipated Annual Plan Outlay of all states and Union territories. The state electricity boards have all along failed to realise the 3% statutory rate of return on their assets. This has serious consequences because the resource generation capacity of SEB's has a direct bearing on their capacity to invest and contribute to the crucial infrastructure needs of the economy. Since a good part of the financial loss may be attributed to government controls of one kind or another, it was important to go beyond the financial performance in search of an indicator of the efficiency of investment.

Liberalisation, its ardent advocates argue, is the panacea for all ills of the public sector. Some of the public sector units may beg to differ. Mainak De writes⁽³⁰⁾ that, sure, there are several public sector companies like the Steel Authority of India Ltd., (SAIL), Mahanagar Telephone Nigam Ltd., Indian Airlines and the oil majors which are embracing liberalisation and battering down the hatches to fight competition. But there are many of their brothers in the country who still want the protective umbrella of the government and are not willing to venture out. For them, the dawn of liberalisation is more like a nightmare since they are just not equipped to deal with competition. The combined net profit of the profit making public sector enterprises has increased by 35% from Rs.3,271 crores in 1993-94 to Rs.4,425 crores in 1994-95,

(30) Business World

26 June 9 July 1996

while 130 of 246 public sector enterprises in the country are today making profit. Remaining 116 are today facing an uncertain future.

According to a study done by the Industrial Development Bank of India (IDBI) on 550 assisted companies net sales grew to Rs.1,52,174 crores during the year 1995-96 as against Rs.1,20,509 crores in the previous year⁽³¹⁾ The increase in sales has resulted in a higher net profit which stood at Rs.13,759 crores during the year over Rs.10,422 crores in 1994-95. The study says that the private sector displayed an impressive performance during 1995-96 with the overall sales rising by 26% and net profit by 32%.

Table 1.12 shows the list of top 10 profit earning private sector enterprises for the year 1995.

The economic survey 1992-93 says⁽³²⁾ that the financial performance of public enterprises has been a matter of wide interest and concern. The public sector enterprises earned a rate of return of 2.23% on capital employed in 1990-91 which declined upto 2.09% in 1991-92. The profitability of public sector enterprises in terms of gross profits is also found to be low and also lower than private sector. The Board of Industrial and Financial Reconstruction (BIFR), set up in January 1987 under the Sick Industrial

(31) The Economic Times

8 August 1996

(32) Government of India: Economic Survey : 1992 - 93;

pp.141-142

TABLE 1.12**TOP TEN PROFIT EARNERS - 1995**
(PRIVATE SECTOR)

<u>COMPANY</u>	<u>OWNER</u>	<u>NET PROFIT</u> (Rs.Crore)	<u>TURNOVER</u> (Rs.Crore)
Reliance Industries	Ambani	1064.9	5757.8
Essar Gujarat	Ruias	397.5	969.0
Telco	Tata	319.0	5683.1
Bajaj Auto	R.Bajaj	309.6	1908.1
Grasim Industries	Birlas	308.6	2149.6
Hindalco	Birlas	292.0	1074.8
Tata Chemicals	Tatas	286.7	924.4
L & T	-	277.4	3137.0
TISCO	Tatas	264.2	4258.1
ITC	BAT Inc.	257.6	2534.7

SOURCE: Companies' Balance Sheet

Companies (Special Provisions) Act, 1985 (SICA) to revive potentially viable sick industrial companies or recommend the closure of totally non-viable companies had received 1772 references since its inception upto the end of December 1992. It is found that the ratio of companies on the revival path to those on the road to liquidation works out to 2:1.

Russi Modi, Chairman of Indian Airlines and Air India, addressing a select audience organised by Public Sector Relations Forum in Madras expressed the view that "Public Sectors are gold mines. We are yet to know how to extract the gold from it"⁽³³⁾ Modi further stated that to make the running of public sector units smooth and efficient, accountability coupled with system of reward and punishment is important.

India, which ranks 7th in terms of area and 2nd in terms of population in the world, ranks 147 in GNP per capita. With reference to production, India ranks first in sugar, 4th in nitrogenous fertilizer, 5th in cement and 13th in crude steel. As far as the minerals are concerned, our bauxite deposits are 5th largest in the world, coal is 6th and iron ore is the 7th. Still India's rank in the world in terms of GNP per capita is only 147⁽³⁴⁾ The only

(33) The Economic Times

8 August 1996

(34) A.N.Agrawal, H.O.Varma and B.C.Gupta; India - Economic Information Year Book : 1995. op cit. p.18.

solution to this situation is rapid industrialisation. In this respect, opening up our economy is the right step, provided both public and private sectors improve efficiencies and produce 'reserves' for further investment.

We often talk about lack of fund for our projects. But it is reported⁽³⁵⁾ that during the discussion with our Finance Minister Mr.P.Chidambaram in Washington, World Bank President James D Wolfensohn commented about our slow process of project implementation. As on date the undisbursed world bank loan to India is US\$ 9.4 billion. India has to pay fee, though nominal, for non-utilisation of the sanctioned loans. According to one report, it comes to about Rs.50 crores a year.

Situation in neighbouring countries is also not different. In a conference on Management of Public Undertakings organised at New Delhi (April 17 - 20, 1995) by National Productivity Council with participants from Bangladesh, China, Hong Kong, Indonesia, Iran, Korea, Malaysia, Mongolia, Nepal, Pakistan, Philippines, Sri Lanka and India, M.C.Gupta, Secretary, Department of Industrial Development, Ministry of Industry and the Chairman of National Productivity Council agreed to the view⁽³⁶⁾ emerged from the conference that;

(35) The Times of India

2 October 1996

(36) Productivity News Vol.33, No.4,

Sept - Oct 1995. pp.11-12

Unfortunately many of the public sector enterprises are incurring huge losses year after year inspite of various efforts at improving their performance by further investment for their diversification, rehabilitation or modernisation. While there may be many reasons for the continued poor performance of the public enterprises, the time has come when we must confront the situation squarely and face the issues on productivity, cost reduction, waste elimination and profitability as important indicators of efficiency, even though the existence of public sector is based on two dimensions, the first being the public dimension which refers to the public purposes such as the generation of employment or the promotion of certain social goals; the second being the enterprise dimension which refers to its commercial function.

Before concluding, the latest information published in newspapers regarding a project - Cochin International Airport - is worth mentioning. It is reported that⁽³⁷⁾ the project cost initially pegged to Rs.300 crores is now found to go to a level of Rs.400 crores. This revision of the project cost will be discussed and finalised in the next board meeting. The schedule for completing the project by end 1997 holds good now.

The above factors lead to the question of very existence of public sector industries. On the one hand private sector is flourishing and on the other hand public sector is coming down heavily and moving towards the sick list. The talk of the day is to convert public sector to private sector. This type of change, in a country like India, will take a long time. Therefore, it is essential,

(37) The Economic Times

3 October 1996.

for accelerating the pace of industrial growth, to improve the standard of performance of the public sector enterprises. Even though the reasons for the unsatisfactory performance of the public sector industries are discussed in so many circles, the salient point is the poor capital expenditure decisions and implementation. Therefore an attempt is made to find out the impact of capital expenditure decisions and their implementation in the success stories of private sector compared with public sector companies. Based on the study, recommendations are made to adopt the good points being practised in the private sector capital expenditure decisions to the public sector for their betterment.

1.2 STATEMENT OF THE PROBLEM

It has been brought out in the above pages that the performance of public sector companies are comparatively poor in relation to the private sector companies and one of the main reasons for the the poor performance is the poor management of capital expenditure projects in public sector companies. Therefore, an attempt is made here to make a comparative evaluation of capital expenditure decision in private and public sector companies in India.

1.3 OBJECTIVE OF THE STUDY

The major reason for the poor performance of the public sector enterprises in India is always attributed to the poor quality of capital expenditure decision. Identification of capital expenditure, study of alternatives, fixation of priorities, method of evaluation, method of implementation etc., all are under severe criticism. The time delay in the implementation of the projects along with cost overruns will adversely lead to huge variation in investment cost, which an organisation can never cover up in its life time. Also, the capital expenditure decisions coming up during the life of the plant will be continuously having the same problem. The actual return on investment can never be compared with the feasibility report figure.

In comparison to this, capital expenditure decision in private sector industries are made after very thorough analysis. Generally, emphasis is laid down on the return on investment. Decisions are fast and unbiased, but based on detailed financial analysis. The control points made by the private sector management in the implementation of capital expenditure decisions are also noteworthy. Projects are completed within the specified time. Cost overrun is negligible in many of the private sector enterprises.

The objective of this study is to systematically analyse the factors which are affecting the dynamics of the capital expenditure decisions in the initial stage and during the life of the organisation, both in public sector

and private sector enterprises, compare the findings and recommend the possible improvements, so that public sector will also flourish like the private sector industries.

1.4 HYPOTHESES

The hypotheses of this study are :-

1. Performance of public sector enterprises is poor compared with private sector enterprises.
2. Performance of public sector enterprises can be improved by improving capital expenditure decision.

1.5 METHODOLOGY

Both primary and secondary data were collected for the study. Primary data were collected through a structured questionnaire and a schedule, the format of which are shown in Appendix IA and IB respectively. Secondary data were collected from various books, published articles and periodicals.

The questionnaire was prepared and sent to various companies on 9 June 1993. Fortysix public sector and 55 private sector companies in Kerala along with 28 public sector, 34 private sector and 27 chronically sick public

sector companies totalling to 190 were contacted initially for getting the questionnaire filled up. Nobody responded and hence reminder letters were sent to the same organisations repeatedly, first on 10 November 1993, second on 31 January 1994 and the third on 3 September 1994. By the end of 1994, replies were recieved from 23 companies but none of them returned the filled up questionnaire. The replies can be classified as follows:-

<u>Reply</u>	<u>No. of companies</u>
1. Requested to come for discussion	3
2. It is not possible to furnish the details	2
3. Requested to contact corporate office	2
4. Can not entertain the request for filling up the questionnaire	3
5. Will not be able to part with the information called for	2
6. No capital expenditure in the organisation (sick industry)	1
7. Can not divulge the information	4
8. Due to administrative difficulties it is not possible to comply with the request	1
9. Executives are concentrating to meet production targets and hence not in a position to reply	2
10. Management is not accepting the study	3
	23
	====

From early 1995 onwards, attempts were made to get the questionnaire filled through friends working in various companies. Whenever an opportunity is available to meet senior executives of various companies either in conferences or seminars or in training programmes, it is used to seek their help for getting the questionnaire filled and also for getting their views regarding various aspects of capital expenditure prevailing in their companies. Many of them responded favourably and hence could get back 54 filled up questionnaire along with other relevant details of capital expenditure.

Twentytwo companies gave opportunity to visit their company and discuss with their executives in detail regarding the questionnaire and also could discuss problems faced in planning, executing and implementing capital expenditure. In all these 22 cases, it was possible to meet the chief finance officer and also chief engineer of the company. A schedule was prepared and used to collect data during the visit to various companies and also to collect data during the discussions with senior executives of various companies, whenever opportunities were obtained to meet them. With this, data for research could be collected from the following group of companies.

I KERALA

a) Public sector..	6
b) Private sector.....	5
	—
Total.	11

II ORISSA

a) Public sector 8

b) Private sector..... 8

—
Total.. 16

III Companies from other

states in India 27

(major and private)

GRAND TOTAL 54

Twentytwo Companies out of 54 companies were visited during the course of this study are 4 public sector and 5 private sector companies in Kerala, 5 public sector and 5 private sector companies in Orissa and 3 companies from other states.

The types of industries covered by the study are given below:-

<u>Type</u>	<u>No</u>
1. Chemicals	9
2. Steel	7
3. Engineering	7
4. Aluminium	5
5. Automobile	4
6. Agricultural products	2
7. Paper and pulp	2
8. Textile	2

9. Plastic	2
10. Ferrochrome	2
11. Shipping	1
12. Cable	1
13. Tyre	1
14. Refinery	1
15. Fertilizer	1
16. Machinery	1
17. Refractories	1
18. Power	1
19. Cement	1
20. Electronic	1
21. Tobacco	1
	===
Total	54
	===

Attempt was to collect data for five years. But number of years for which data could be collected varies from 2 to 6 years. Details are as follows:-

1 year data could be collected from	0	company
2 year data could be collected from	8	
3 year	"11
4 year	"11
5 year	"20
6 year		4
		—
Total		54

1.6 SCOPE AND LIMITATIONS OF THE STUDY

This study is focussed on public and private sector companies in India. The study is confined to industrial undertakings only. Public sector and private sector companies in the states of Kerala and Orissa along with private sector companies in other states were studied. Even though the original plan of 190 companies as the sample size could not be accomplished, as the responses were very poor, but data could be collected from 6 public and 5 private sector companies in Kerala, 8 public and 8 private sector companies in Orissa along with 27 private sector companies in other states totalling to 54 companies. The number of years of data collected varies from 2 years to 6 years.

Factors which are affecting capital expenditures and hence leading to the performance of private sector compared to public sector companies are studied. After the study and analysis, comparisons are made between public sector and private sector, and suitable recommendations are made so that public sector industries can also perform equally well as the private sector industries in India.

The limitations of the study are the following:-

1. Number of companies covered in Kerala is low
2. Data could not be collected from sick companies
(Private Sector or Public Sector)

3. Response from public sector other than those in Kerala and Orissa was very poor
4. Few responses were qualitative rather than quantitative
5. Companies studied are generally not willing to disclose their identity and hence the name of the companies studied could not be specified in this thesis.
6. Conclusions are derived based on the information furnished by the respondents.

1.7 SCHEME OF STUDY

This thesis is organised under eight chapters.

The first chapter gives an introduction to the topic. It covers the relevance of the study, relative performance of private sector companies and public sector companies, statement of the problem, objective of the study, hypotheses, methodology adopted in the study, scope and limitations and scheme of the study.

The second chapter reviews the literature available in the area of study. Literature available in libraries of most of the premier educational institutions of the country like, Indian Institute of Management, Bangalore, Indian Institute of Management, Calcutta, Indian Institute of

Science Bangalore, Xavier Institute of Management Bhubaneswar, National Institute for Training in Industrial Engineering, Mumbai, Tata Management Training Centre Pune, Sambalpur University, Sambalpur, etc., in addition to School of Management Library, Cochin University of Science and Technology, Cochin were covered.

The third chapter is concerned with the theoretical concept related to capital expenditure in companies; why capital expenditure is needed in industries, what are the available methods of capital expenditure evaluation, how sensitivity analysis, risk analysis and post audit are used in capital expenditure analysis etc., are explained.

The fourth chapter explains the evolution of public sector in India and its present condition. The fifth chapter describes the private sector.

The sixth chapter covers the details of analysis done with the data collected.

The seventh chapter presents the conclusions. In the eighth chapter the suggested recommendations for improvement are given.

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CHAPTER - II

C H A P T E R - II

REVIEW OF LITERATURE

The previous chapter gives an overview of the relevance of the study and problem statement. It also explains the objective, hypotheses, methodology, scope & limitations and scheme of the study. In this chapter, literature available in the field are reviewed.

Attempts to study capital expenditure systematically were far and few in India. But in the United States of America, it was started immediately after second world war. Joel Dean's⁽¹⁾ comprehensive study of capital budgeting which was published in 1951 was considered to be the first of its kind. Later the Machinery and Allied Products Institute study in 1956 has revealed that 2 out of 133 companies studied, had started using discounted rate of return for capital budgeting. Another study was conducted by M A P I under the leadership of George Terborgh⁽²⁾ and

(1) Joel Dean; Capital Budgeting; Columbia University Press, New York. 1951.

(2) George Terborgh; Business Investment Management; Machinery and Allied Products Institute, Washington D.C, 1967

published in 1967 It was further analysed by Richard MacNabb in 1972, mainly to find out which type of investment analysis technique is in use. A study in 1959, "The return on capital as a guide to Managerial Decisions" by the National Association of Accountant (NAA) showed that out of 44 large companies, 42 used the rate of income on investment as a capital budgeting criterion. Miller in 1960 in a study on practice in calculating and using return on investment reported that 34 out of 127 well managed firms used discounted cash flow in making investment decisions. Solomon (Zn) Soldfosky and Amling Frederick separately made studies in the year 1963 to find out how few different techniques are used in capital budgeting by various companies.

In the year 1966, Christy in his study on **Capital Budgeting - current practices and their efficiency** and George Terborgh in 1967 came to the conclusion that the spill over from theory to practice has been slow. Klammer in his study in 1973 was of the view that more adoption of various analytical tools is not suffiicient to bring about superior performance.

A brief account of the above studies shows that in the U.S.A. - a highly developed country - the use of sophisticated technique has only gradually increased. There is a great variation in the use of DCF methrhods in large and small companies. In the forties, practically no firm in the U.S.A. was using discounting techniques for making capital expenditure decisions. The firms primarily depended upon payback or accounting rate of return method. In

seventies, however, most of the large corporations seem to be having "great awareness and desire to use sophisticated techniques" It thus took about three decades in the U.S.A., to switch over to the theoretically correct technique. In India, not much study has gone in this field. A few studies conducted in the field of capital expenditure are discussed below;-

Managing productivity of capital is one of the most challenging tasks of corporate management. The first step towards this is to find out how much productive work does the capital employed do? How does it get a return on contribution? Throwing light on these aspects while delivering a lecture on "Managing productivity of Corporate Capital A new approach to its measurement", S.C.Kuchhal of Indian Institute Management, Ahmedabad has said that profitability of capital is an important parameter of corporate behaviour. Arranging for measuring the profitability of the proposed investments and also for the involments in progress are equally important compared to the returns from the existing capital.

Kuchhal has suggested a set of ratios for measuring capital productivity. He could resolve these parameters after several brainstorming sessions with company executives, academicians, bankers, industrialists and other professionals. Corporate index for measuring capital productivity with assigned weights are shown in Table 2.1.

(Source: Formulated by S.C.Kuchhal)

Table 2.1
Corporate Index for Measuring Capital Productivity

	<u>Weights</u>					
<u>Liquidity</u>	5	4	3	2	1	0
1. Current asset to current liability	<u>1.5</u> 1.8	<u>1.3</u> 2.0	<u>1.1</u> 2.2	<u>1.0</u> 2.4	<u>0.9</u> 0.9	<u>0.8</u> 2.6
<u>Operational efficiency</u>						
2. Gross sales to capital employed	above 3	2.5to 3.0	2.0to 2.4	1.5to 1.9	1.0to 1.4	< 1.0
3. Contributions to gross sales	above 30	25to 30	20to 25	15to 20	10to 15	< 10
<u>Profitability of Capital Employed</u>						
4. Operating profit to capital employed	above 30	25to 30	20to 25	15to 20	10to 15	10& less
5. op. av. contribution to operating profit	1.5to less	1.5to 2.4	2.5to 3.4	3.5to 4.4	4.5to 5.4	5.5 above
<u>Profitability of Capital Owned</u>						
6. Net profit to net worth	25& above	20to 25	15to 20	10to 15	5to 10	5& less
7. Financial leverage saving before inter- est & tax to profit	1.5to less	1.5to 1.9	2.0to 2.4	2.5to 2.9	3.0to 3.4	3.5 & above
<u>Management of Earnings</u>						
8. Dividends to share capital(%)	50& above	40to 50	30to 40	20to 30	10to 20	10& less
9. Retained earnings to profit after tax(%)	80& above	65to 79	50to 64	35to 49	20to 34	20& less
<u>Market Appraisal</u>						
10. Price to EPS ratio	17& above	14to 17	11to 14	8to 11	5to 8	5& less

To test the methodology, the annual reports of 48 largest private sector companies (based on gross sales from 1 July 1986 to 30 June 1987) were analysed. Companies scoring 60 and above on the composite index got the following ranking:-

Hindustan Lever	80
Bajaj Auto	80
Brooke Bond	78
Ceat Tyres	76
Lipton	70
M R F	70
Dunlop	62
I T C	62
Rallis	62
Zuari Agro	62
Mukund Iron	60

The advantages of this type of composite index⁽³⁾ are the following:-

1. Helpful for corporate planning and control
2. For identifying and quantifying the business and financial risks associated with productivity of capital employed especially for credit rating agencies

(3) Business India

18 April-1 May 1988

3. An effective insight is made available into the corporate financial behaviour
4. Lending and financial institutions and commercial development banks can use this approach to maintain a good track of the companies assisted
5. Policy makers in government can use this approach to develop a deeper insight into corporate financial health.

Even though this approach is a very useful one for assessing the overall performance of the corporate sector, it does not emphasise the importance of capital expenditure incurred in each year, progress of capital expenditure programmes, return for capital expenditure programmes etc.,

Addressing the executives of public sector enterprises at a seminar on "Project Implementation" at Delhi in 1988, the then Union Planning and Programme Implementation Minister Madhav Singh Solanki underlined the need for public sector enterprises to adopt a project recovery strategy for projects which have suffered slippages. Since independence, the Estimates Committee, Public Accounts Committee, Committee on public undertakings and Comptroller and Auditor General of India have been underlining these slippages with reference to various projects indicating also the reasons that contributed to these and pinpointing various issues in this context. Unfortunately, most projects appear half baked and ill-conceived.

If one was to assign reasons for the delay in project implementation, it could assign 30% to ill-conceived project formation, 40% to cost escalation and that could not be anticipated at the time of project formulation, 20% to inadequate fund flow with the projects - inadequate with reference to both quantum of funds and timing - and the balance 10% to so-called mismanagement.

P.Chathopadhyay wrote⁽⁴⁾ that with the specific issue of project recovery the government should do the following:-

1. Appoint a cell either in the cabinet secretariat or Prime Minister's secretariat or in the Bureau of public enterprises for splitting and judging the nature of failure pointed out by the CAG(Comptroller and Auditor General) and the CPU(Committee on Public Undertaking) so that remedial measures could be taken effectively before it is too late.
2. Appoint a professional committee to assess the capital requirements of the public enterprises.

P.L.Joshi, Assistant Professor of Financial Management, NITIE, Bombay, wrote⁽⁵⁾ that companies in the corporate sector are going for massive expansion of their business in

(4) The Economic Times

30 July 1988

(5) Purchase

January 1988

order to gain long term profitability This involves huge capital expenditure. Such expenditure merits special attention on account of the following reasons:-

1. Proper investment of funds is necessary for a wider perspective of material economy.
2. Due to rapid technological advances, the risk of obsolescence is very high.
3. Once committed, it is difficult to reverse on capital expenditure decision.
4. Capital expenditure decisions have a bearing on future profit for over a number of years.
5. Measuring the costs and benefits of a capital expenditure is difficult, particularly when they are somewhat tangible and intangible in nature. In addition, such costs and benefits occur at different points of time.

In the case study conducted by Joshi in a food product company it is found that most of the control procedures are taken care of. But regarding post completion audit no serious attempt has been made. It has been specified very clearly that post audit is to promote learning and draw lessons from experience to improve future decisions and not to penalise the persons involved. But Joshi clarifies that it will take years to organise a good post audit evaluation.

Investment decision making assumes the greatest importance for any firm, whether small or big. This is mainly because of the associated problems like non availability of decisions on one hand, and the length of time involved for which decisions are implemented, on the other. Particularly in a capital scarce and planned economy like India, the need for precise investment decision in the macro units can hardly be exaggerated. Since the benefits from investment proposals extend into the future, accrual is not always certain. In other words, in most of the cases, these decisions are made in an environment of risk and uncertainty which are associated with the factors affecting the net outcome. Risks exist in projects where expected returns are not precisely pre-determined. Although the concept of investment proposals of project is relatively old, risk and uncertainty analysis in investment decisions is of recent origin. There is only scanty literature available in this area which is not sufficient enough to throw light upon capital expenditure practices of Indian firms.

Another work done in the field of capital expenditure is by the Economic Times Research Bureau headed by N.D.Prajapati⁽⁶⁾. They have found out the average capital cost per project planned during January - September 1987 by 96 companies which entered capital market. The average capital cost they worked out stood at Rs.9.4 crores. The total cost of these 96 companies was Rs.904.2 crores of

(6) The Economic Times

7 January 1988

which about 50% has been earmarked for meeting the cost of plant and machinery. They have also studied from where the fund has been generated and how these funds have been used.

The pattern of financing as revealed by them is as follows :-

Equity capital	Rs.355.3 crores
Loan funds (from financial institutions and banks)	Rs.480.0 crores
Subsidies and others	Rs. 68.9 crores

Total	Rs.904.2 crores
	=====

The following is the break-up of project cost:-

Land and building	Rs. 96.2 crores
Plant and machinery	Rs.448.0 crores
Preliminary & preparative expenses	Rs.105.9 crores
Working capital	Rs. 67.5 crores
Other fixed assets	Rs. 52.6 crores
Technical knowhow fees	Rs. 23.1 crores
Others	Rs.110.9 crores

They have given the break-up of project costs of all the 96 companies and also the break-up of project finance. In short, the study has been successful in classifying the source of finance. Also an overall picture of the project cost involved has been brought out by the analysis of these 96 companies. No attempt has been made in the study to find out the likely escalation of costs subsequent to the original estimated cost presented by the companies. It is possible that some companies may have experienced an over run in the project cost subsequent to the original planned investment, similarly the study also does not deal with the implementation of the project to find out whether the plans are on stream as scheduled at the time of public issue. Moreover, nothing has been mentioned about the evaluation of the project.

A sample survey conducted by a team under the leadership of A.Ranganathan among 60 small units in Bombay during 1988 regarding their capital expenditure plans brought to light the following salient points⁽⁷⁾ :-

1. The firms had multi sources of financing and the role of banks appears to be a dominant one.
2. Very few firms made use of time adjusted technique of investment analysis.

(7) The Economic Times

7 January 1989

3. Most of the firms did not get proper guidance and hence time and cost elements are relatively high.
4. The entrepreneurs were not familiar with the modern investment analysis techniques.
5. Risk factors such as marketing, government policies, labour unrest and cost, taxation policy, shortage of raw materials, working capital etc., often resulted in cost escalation.
6. Financial institutions did not really insist on the rigorous methods of investment analysis.

According to the surveyed firms, their major problem is lack of elaborate data at the unit level. This results in high cost in data compilation and analysis. The study concludes that it is important to incorporate more controls in the capital expenditure decision models of a small firm. Even though, there is no sound evidence to show that large firms of our country are making use of proper capital expenditure techniques, a good beginning can be made by small firms for their betterment. As compared with the large firms, since the number of risk factors are less for a small firm, capital expenditure analysis can be carried out more meaningfully and efficiently in these units. The study team feels that innovation of this neglected aspect of capital expenditure in our small firms' managerial practices can fetch the desired results for their progress.

L.S.Porwal, Professor of Commerce, University of Delhi has conducted a study on the different aspects of capital expenditure decision making in large manufacturing companies in the private sector in India and compared it with the practice followed in U.S.A. The study has been financed by ICSSR (Indian Council for Social Science Research) This is an empirical study of the organisational, quantitative, qualitative, behavioural and control aspects of capital budgeting in large manufacturing companies in the private sector in India.

A business firm has got to be forward looking if it wants to ensure satisfactory profitability and growth in the years to come. Proper planning based on sound principles, policies and procedures is necessary to achieve the overall objectives of a business concern. There is a need for an increasing use of theoretically correct technique because the vitality of a concern depends to a large extent on its ability to review itself through capital expenditure. Capital budgeting involves long term planning for proposed capital outlay and their finances. It is the process of allocating the financial resources of a business to investment in current and fixed assets in order to maximise the value of a business.

The study by Porwal includes all the non-finance, non-private, non-government manufacturing public limited companies in India whose total net tangible assets were Rs.10 crores or more in the year 1969-70. There were in all

118 such companies in India. Questionnaires⁽⁸⁾ like the following were sent to financial directors/managers of all the 118 companies:-

1. How long back the capital expenditure proposals are originated and planned?
2. What techniques are used for evaluating the work of capital projects; are they using DCF techniques?
3. What are the sources of financing?
4. How is the project risk incorporated in the investment decision making process?
5. What are the controls on capital expenditure decisions?
6. What are the capital budgeting procedures? etc.,

Responses from 61 companies (51%) were received. The usual methods questionnaires sent by mail and personal interviews - were adopted in this study.

The group-wise industrial classification of responses are tabulated in Table 2.2.

(8) L.S.Porwal; Capital Budgeting in India;
Sultan Chand and Sons; New Delhi. 1976. p.2

Table 2.2

Group-wise Industrial Classification of Responses

<u>Group of Industries</u>	<u>No. of Companies</u>	<u>Response</u>	
		<u>No.</u>	<u>%</u>
1. Iron & Steel	4	1	25
2. Aluminium	6	4	67
3. Cement	6	2	33
4. Coal & Mining	2	0	0
5. Mineral oils	3	1	33
6. Chemical	26	16	62
7. Engineering	25	12	49
8. Sugar	4	0	0
9. Tobacco	1	1	100
10. Paper and paper products	9	1	11
11. Textile	20	6	30
12. Jute	3	1	33
13. Plantation	4	4	100
14. Others	5	3	60
Incomplete questionnaires		(9)	
	---	---	---
	118	52	44
	===	==	==

Source: Survey data by Porwal

It has been found during the study that most of the large companies have become quite conscious of planning their capital expenditure in a better manner.

The improvement in use of D C F techniques in U.S.A. is shown in Table 2.3. It shows that use of DCF technique had increased from a mere 1.5% in 1948 to 55/60% in early 70's.

Table 2.3

Use of D C F Technique in U.S.A.

<u>Year</u>	<u>Study by</u>	<u>% of DCF Users</u>
1948	MAPI	1.5
1951	Heller	Negligible
1956	MAPI	1.5
1959	Istvan	10
1960	Miller	31
1963	Amling	19
1969	William	61
1972	MAPI	70
1972	Klammer	57
1972	Brigham et al	94 (in utilities)

1973	Petty et al	58
1974	H Su	54

Source: Survey data by Porwal

It has been found during the study that around 44 per cent of the respondents have shown preference for DCF techniques in India, but most of the firms were using a combination of traditional and modern evaluation techniques of capital budgeting. Compared to this, most of the large corporations in the U.S.A. are now using DCF technique. They are also using a combination of different methods.

It can be seen from Table 2.4 that by and large uncertainty in the availability of inputs, inability to predict key factors and uncertainty in government policy are the major factors comprising the conceptual frame of project risk in India.

Table 2.4

Management's definition of risk in India

<u>Definition</u>	<u>% of total responses</u>
1. Uncertainty in availability of raw materials and power and inability to predict key factor	29

2. Probability of not achieving a target rate of return	25
3. Uncertain market potential	17
4. Uncertainty in Government policy	12
5. Payback period uncertainty	10
6. Technological changes	7

Source: Survey data by Porwal

Two-thirds of large companies under study are using post audit as a method of control on capital expenditure in India, but the quality of cost audit needs improvement. Nearly four-fifths in the USA use post audit for control.

The study was intended to compare various aspects of capital expenditure decision like cut-off point, source of fund, capital rationing, etc., with the industries in the USA. The study does not provide any positive suggestions to improve capital expenditure decision process so as to improve total performance and hence to improve the economic situation of the country. Also it does not compare with different classes of industries like public sector and private sector, large scale and small scale, oil, ferrous and non-ferrous industries, manufacturing organisations and utilities, etc., as far as capital expenditure decisions are concerned.

Besant C Raj⁽⁹⁾ of Administrative Staff College of India, Hyderabad, has conducted an empirical study and analysed the dynamics of public industrial investment decisions in India. The study analysed the organisation, guidelines, criteria for selection of project, the decision makers, the decision process, etc, Public enterprises are conceived in developing nations as instruments of economic development as well as dispensers of social justice. While they are conceived with this two - fold objectives, in practice considerable confusion prevails with regard to setting objectives for individual public enterprises, defining the criteria of efficiency for the enterprises; and evaluating the performance of these enterprises. A public enterprise in a developing nation, which is governed by this twin objective is like a coach being pulled by two fine horses.

This study also tried to understand why public enterprises in developing countries fail to fulfil the objectives for which they are being established in large numbers. The study focussed on,

1. Identifying the various forces that operate in the process of capital expenditure decision making and develop a conceptual framework with regard to organisational set-up.

(9) Besant C Raj; Public Enterprises Investment Decisions in India - A Managerial Analysis;
op cit.

2. Examining in detail the various stages in the capital expenditure decision process.
3. Examining the organisational set-up for capital expenditure.

To be little more precise, the study was trying to find answers to the following questions:-

1. What are the objectives, guidelines and procedures recommended for capital expenditure decision making in public enterprises in India?
2. What is the rationale behind these guidelines?
3. What are the current capital budgeting practices in public enterprises in India?
4. Is there any difference between current practices and guidelines? If so, what are they?
5. What are the problems faced by the capital expenditure decision makers?
6. What changes, if any, are needed to make current practices conform to guidelines?
7. How do the guidelines and practices of these enterprises compare with the capital budgeting theory?

Extensive interviews were carried out to collect necessary data for the preparation of the thesis. American consultancy firm Peat, Marwick and Mitchell at Boston (who helped Planning Commission prepare the manual of feasibility studies for investment decisions for public enterprises), professors from the Harvard University, who were consultants/advisors to Government of India, and senior managers of a number of public sector enterprises in India are a few among the list of individuals interviewed by Raj. Moreover, he has visited many companies like Tube India Limited, Praga Tools Limited, Hindustan Machine Tools Limited, Modern Bakeries India Limited, State Farms India Limited, etc. A schedule was used as a guide in interviewing.

The study revealed that the present system of capital expenditure in India suffers due to various causes but concludes that given the will, desire and determination on the part of the policy makers, the planners and the senior executives of Government of India, it is possible to design and develop a system of capital expenditure that would accelerate economic development and bring happiness and prosperity to the poverty stricken people of this country. The task is difficult, but it is not insurmountable. With bold, efficient and dedicated resource management, it is possible to usher in a new era for us. The public enterprises in India through the dedication and efficiency of the managers, the decision making skills of the senior administrators and by the right kind of political leadership, would help transform the economic life of these masses of people who have staked everything to establish these enterprises.

The study suggests ways and means of improving the capital expenditure decisions in India. But it does not take into account the comparatively better system of capital expenditure being followed in private sector enterprises.

Doctoral disseration of Moustafa H Abdelsamad⁽¹⁰⁾
Evaluating Capital expenditure Proposals in Large Industrial Corporations - submitted at The George Washington University and published as 'A Guide to Capital Expenditure Analysis' in the year 1973 is another good piece of work done in the field of capital expenditure. This study was to assess the comparative advantages of different capital expenditure evaluation techniques as is being practised in the USA.

The methodology consists of personal interviews and questionnaire. Interviews were conducted with executives of 27 corporations in the USA. Questionnaires were sent to senior financial officers of 460 large industrial corporations in the United States, as listed in the Fortune Directory of 15 June 1968. Replies were received from 200 companies. By virtue of their size, these companies are leaders in their fields. Their investment decisions have a significant effect on the level of economic activity, and

(10) Moutafa H Abdelsamad; A Guide to Capital Expenditure Analysis AMACOM - A Division of American Management Association, New York 1973

the magnitude of capital expenditure they incur makes them an ideal population for research. Each respondent was asked to check, in order of importance, the method or methods currently used by the firm for evaluating capital expenditure proposals, once with respect to major projects like new facilities, major replacement, etc., and again with respect to all other projects like routine projects, regular replacements, cost saving projects, etc. Each respondent was asked to appraise the advantages of the methods used by the firm by grading them as great advantage, slight advantage and no advantage.

Similarly the weaknesses of evaluation methods were also asked to be graded as major weakness, minor weakness or no weakness. Respondents were asked to check which techniques are currently used by their companies. Questions were also asked to find out the problem areas.

A separate questionnaire was sent to top financial officers of 673 large industrial corporations of the United States as listed in Fortune Directory of May 1970. Completed questionnaires were received from 229 corporations. In this questionnaire, each respondent was asked whether his firm computes the cost of capital, what cost of capital figure is used for, how often the firm updates computation of cost of capital, whether the figure before or after taxes is used, how the cost of each type of capital (long-term borrowed capital, common stock capital, preferred stock capital and retained earnings) is determined, etc,

The major differences among the five capital expenditure evaluation methods are the following:-

1. All methods except payback method measure profitability.
2. The payback, DCFR and NPV use cash flows, but MAPIR and ARR use accounting income in place of cash flows.
3. Two methods, DCFR and NPV consider time value of money and hence considered superior to other methods.
4. Theoretical acceptability of the various methods are ranked as follows:-

1st rank	DCFR
2nd rank	NPV
3rd rank	MAPIR
4th rank	ARR
5th rank	Payback

5. None of the five methods fully measure risk (risk is related to the uncertainty and distribution of cash flows)

6. The payback method is easy to compute. The trial and error process of computing DCFR makes it relatively difficult to calculate.

The analysis of responded questionnaire shows the following ranks based on the percentage of users:-

<u>Rank</u>	<u>Method</u>	<u>Percentage of users</u>
1	Payback	80
2	DCFR	69
3	ARR	57
4	NPV	25
5	MAPIR	9

When the five methods are ranked according to the number of respondents who consider them the most important for capital expenditure evaluation and expressed as a percentage of total users of that method, the following results are obtained:-

<u>Method</u>	<u>No. of firms</u>	<u>Percentage of users</u>
DCFR	93	68
ARR	58	51

NPV	14	29
Payback	45	28
MAPIR	1	6

The above results suggest that DCFR is considered as the most important method for evaluation. Although payback method is the most commonly used method, it is placed fourth only in importance for evaluation. Advantages of methods as viewed by respondents are given in Table 2.5

Main drawbacks especially with DCFR and NPV were found as follows:-

1. Unnecessarily complicated.
2. Imposes heavy demands on analysis staff.
3. Difficult to compare with accounting data.
4. Difficult to sell to top management.
5. Difficult to sell to operating personnel

Table 2.5Advantages of Various Evaluation Methods

<u>Advantage</u>	<u>Payback</u>	<u>ARR</u>	<u>DCFR</u>	<u>NPV</u>	<u>MAPIR</u>
1. Low in cost	*	*			
2. Simple in use	*	*			
3. Accurate			*	*	*
4. Well-known	*	*			
5. Easy to understand	*	*			
6. Requires few assumptions	*				
7. Analyses future data, not historical		*	*	*	*
8. Can be used for evaluating different types of investment proposals	*	*	*	*	
9. Considers the time value of money			*	*	*
10. Easy to post audit	*	*			
11. Easy to sell to top management	*	*			
12. Easy to sell to operating personnel	*	*			

Source: Survey Data by Moustafa H Abdelsamad

Replies from responding firms indicate that very few firms use one method alone for evaluating capital expenditure proposals. The number of firms using various combination of methods are given below:-

No. of methods in <u>combination</u>	<u>For major projects</u>	<u>For all other projects</u>
1	26	37
2	90	87
3	65	45
4	7	5
5	9	9
	—	—
	197	183
	===	===

The most common combinations for both major projects and all other projects in each of the following categories are

<u>No. of methods</u>	<u>Most common combination</u>
2	DCFR and payback or ARR and payback
3	DCFR, ARR and payback
4	DCFR, NPV, ARR and payback

Out of the 150 responding firms, sensitivity analysis was used by 70 firms i.e, 47% and risk analysis was used by 54 percent of the firms.

Major problem areas identified by the study are:-

1. Disclosure of alternatives.
2. Forecasting in general.
3. Underestimation of cost.
4. Overestimation of benefits.
5. Qualitative information not subject to quantitative analysis.
6. Inability of operating personnel to understand logic behind evaluation.
- 7 Shortage of well qualified analysts and reviewers.
8. Price level changes.
9. Lack of standardisation in methods and assumptions used by analysts and evaluators.
10. Inability of the accounting department at a later date to confirm or disprove the accuracy of cash flows in the original capital expenditure projection.
11. Shortage of time on the part of top management to keep up with developments in the field.

Post audit is a comparative study of the estimated and the actual results of a capital expenditure project. Thus post audit studies refer to

- (1) Collecting data on the actual results of the project.

(2) Comparing actual results with those estimated in the proposals and determining the difference between actual and forecast result and

(3) Studying those differences.

Post audits are also known as follow-up studies, performance audits, post completion studies, etc. From the study it was found that 96% of the firms were doing some sort of post audits. But the study was not complete by itself to determine more precisely the extent and nature of these post audits.

One of the major limitations of this study is that it has covered only the large organisations as found out by Fortune Directory. It is not trying to find out whether there is any difference in capital expenditure evaluation techniques used by private sector enterprises and public sector enterprises. Also the study concludes by identifying the different methods being used by different firms in USA rather than identifying the methods or procedures of capital expenditure decisions followed by a particular firm or firms led to its or their success or failure.

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CHAPTER - III

C H A P T E R - III

CAPITAL EXPENDITURE

In the previous chapter, a review of the literature available on the subject is attempted. The present chapter discusses the basic concepts of capital expenditure.

Capital expenditure may be defined as any expenditure other than operating expenditure that represents a large sum of money, the benefits of which extend over a period of time exceeding one year. The key characteristic of a capital expenditure is that at least a major part of the expenditure is made at one point of time and the benefits are realised at different points in time. The benefits expected are basically the inflows of income or advantages resulting from the investment. Benefits may take the form of cost saving, additional revenue or profit. The method of computing benefits may depend upon the method of evaluation used⁽¹⁾

Capital Expenditure involves long term commitment of resources to realise future benefits. Hence capital expenditure reflects basic company objectives and have a long term and significant effect on the economic well being of the firm. Effective planning and controlling of such

(1) Moustafa H. Abdelsamad; A Guide To Capital Expenditure Analysis; op cit. p.7

expenditures are particularly important because of the following reasons :-

- (1) The long term commitment increases financial risk.
- (2) The magnitude of expenditure may be very high and the penalties for unwise decision are usually severe.
- (3) The decision made in this area provide the structure that supports the operating activities of the firm.
- (4) Capital expenditure is the vitamin given to improve the growth of the industrial activity.

Capital expenditure has attracted the attention of top management for quite some time This attention is to be properly placed since capital expenditure decisions affect the whole firm and its direction, and they can be evaluated properly only at the highest managerial level in the organisation. Even when some of these decisions are delegated, top management usually makes it mandatory to subject capital expenditure proposals to sufficient tests to assure that investments are made in the best interests of the company. Many business failures can be traced to inadequate capital expenditure. The hypothesis of this research work is that capital expenditure decisions in public sector industries are inferior in quality to the decisions in the private sector and that it is the main reason for the failure of the public sector industries.

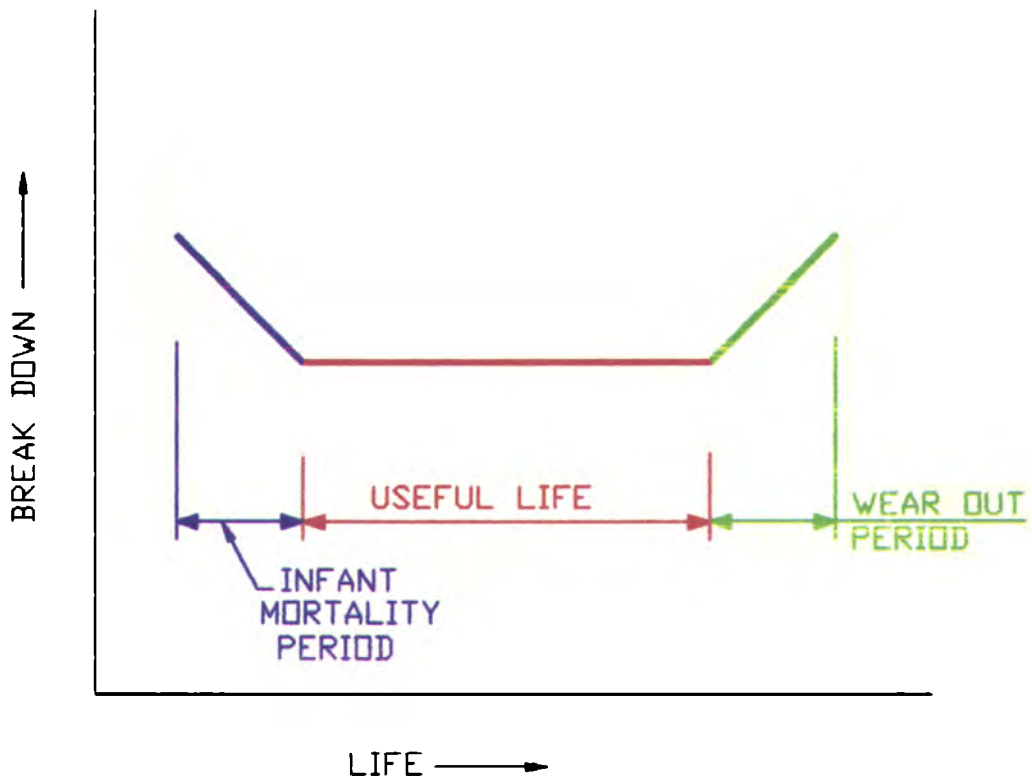
3.1. WHY DO WE NEED CAPITAL EXPENDITURE? :

Efficiency of any system deteriorates with time. Plant and equipment follow the same universal rule. The life cycle of an equipment or a plant is shown in Exhibit 3.1. The breakdown or non availability of a plant or an equipment for production is very high during the initial period of its life. This may be due to initial adjustment or alignment problems or due to initial commissioning problems. In the case of human being, this is called infant mortality period. After this period, the youthful life of the plant or equipment starts. If proper preventive maintenance is done the youthful life can be extended further and further. What ever may be the preventive maintenance, a period will come from there after no type of maintenance will improve the availability. This period is called the wear out period. That means that deterioration has already started and hence the equipment has to be replaced Therefore main need for capital expenditure is for replacement of an equipment or facility when it becomes beyond economic repair Deterioration can be defined as the decline in the performance of an equipment or facility compared to the original one. The effect of deterioration are the following:-

- [1] Maintenance cost is on the increase
- [2] Production quality is getting reduced day by day
- [3] Rate of production is on the decreasing trend.
- [4] Production labour cost is on the increase
- [5] Efficiency of the equipment is getting reduced

EXHIBIT - 3.1

LIFE CYCLE OF A PLANT OR AN EQUIPMENT



Another reason for replacement of an equipment is obsolescence. The equipment will become obsolete due to the development of newer and better equipment day by day. The unwarranted manufacturing costs arising from obsolete equipment will reduce the profits and seriously affect the competitive power of the product. Therefore that equipment or plant which has become obsolete has to be replaced.

When an existing equipment becomes inadequate or insufficient to meet the challenges of making new products or existing products in large quantities due to changing market conditions the question of replacement arises.

As the community now-a-days is more exposed to the awareness regarding pollution an equipment or plant which is producing more pollution problem like more sound, more dust and more fumes is to be replaced with a modern equipment or plant which in no way will be hazardous compared to the old equipment. Therefore the four important reasons for replacement of an equipment or plant are

- [1] Deterioration of the equipment or plant.
- [2] Obsolesence of the equipment due to the development of modern equipment.
- [3] Inadequacy as mass production is the order of the day
- [4] Improved working condition

In addition to replacement which is the conventional need for capital expenditure, the other need for capital expenditure are the following

- [1] Adding new facility for survival.
- [2] Providing pollution control equipment or plant.
- [3] Providing safety protection equipment.
- [4] Expansion or modernisation.

3.1.1. Adding New Facility:

As days are passing by, products which are having product life cycle will vanish from the horizon and new and new products will emerge. To meet this challenge always new facilities are continuously to be added to the existing system

3.1.2. Providing Pollution control equipment or plant :

Community around any plant is now a days becoming more and more aware of the pollution hazards created by the operation of the plant. Therefore every industry is allocating every year a good amount of capital expenditure either for providing new equipment which will create less hazardous conditions compared with the existing system or for providing equipment which will purify the hazardous waste which is already produced.

3.1.3. Providing safety protection equipments :

Safety takes a very important role in the modern industrial set up. Cost of an accident or injury is not only the compensation paid to the employee but also includes the cost of medical help, cost of direct manhours lost and above all the cost of lost morale of other

employees of the organisation. Therefore every organisation provides certain amount in their Annual Capital Expenditure plan for providing engineering control so as to prevent the chance for an industrial accident or injury and also to protect the employees and equipment from accident or injuries.

3.1.4. Expansion or Modernisation :

Expansion or modernisation is the order of the day especially after our liberalisation and globalisation attempt. To become more competitive in the market, equipment which will provide better quality at less cost are always preferred. As the world is moving so fast, any industry has to run as fast as it can so as to be in the same position tomorrow as today compared to the competition in the field. Therefore all industries are doing modernisation or expansion in a small way or in a big way. This will take away the major portion of the capital expenditure every industry is planning in each year. In other words, capital expenditure can be broadly classified into two, namely routine capital expenditure and non routine capital expenditure. Routine capital expenditure can be further divided into three :-

- [1] Replacement
- [2] Providing pollution protection
- [3] Providing safety protection

Non routine can be divided into two

- [1] Adding new facility
- [2] Expansion or modernisation

3.2.0. COST OF CAPITAL EXPENDITURE :

Any capital expenditure project has to be financially viable, technically feasible, commercially profitable, economically desirable and managerially capable. For analysing a capital expenditure project to find out whether it is financially viable the cost of the project is to be compared with the benefits this particular project will generate.

The cost of any capital expenditure project (small to large) may be divided into the following categories.

3.2.1. Cost of Land :

This cost may be subdivided into

- [a] Agreed value of land
- [b] Hidden value of land
- [c] Legal expenditure for land purchasing
- [d] Site development charges
- [e] Fencing and landscaping expenditure
- [f] Cost of internal road

3.2.2. Cost of Building :

This cost may be divided in to

- [a] Cost of constructing factory building
- [b] Cost of constructing laboratory building, R&D building, Quality centre building etc.

- [c] Cost of Administrative building
- [d] Cost of stores building warehouse, godown etc
- [e] Cost of canteen building, rest room etc
- [f] Accessory building like generator set room, compressor room, pump house, boiler house, garage, security office, watch tower etc.
- [g] Quarters
- [h] Club house
- [i] Guest house
- [j] Fee for architects

3.2.3. Plant and machinery :

This cost may be subdivided into

- [a] Imported FOB value if imported
- [b] Import duty
- [c] Shipping freight, insurance etc
- [d] Clearing and forwarding
- [e] Loading and unloading
- [f] Commissioning
- [h] Spares

3.2.4. Technical/Collaboration fee :

This cost may be sub divided into

- [a] Fee for technology transformer
- [b] Cost of training
- [c] Design and drawing

3.2.5. Miscellaneous expenses :

This cost can be subdivided into

- [a] Cost of furniture
- [b] Cost of office machinery
- [c] Cost of cars, jeep, trucks etc
- [d] Cost of recreational facilities
- [e] Cost of effluent collection, treatment and disposal

- [f] Cost of fire fighting arrangements
- [g] Cost of dispensary
- [h] Cost of air conditioning
- [i] Other miscellaneous expenditure

3.2.6. Preliminary and pre-operating expenses :

These expenses can be subdivided into

- [a] Capital issue expenses
- [b] Interest on loan
- [c] Administrative expenses (Including salary)
- [d] Mortgage expenses
- [e] Consultant expenses
- [f] Commitment charges

3.2.7. Cost of advertising and marketing :

This may be for the new products or for improving the sales of the existing products.

3.2.8. Contingency :

Normally 10% of the total cost is considered as contingency to meet a nominal unforeseen variation in cost.

Normal capital expenditure plan includes all the above mentioned items if it is a project by itself. If it is a running plant, one or more items mentioned above may become a part of the annual capital expenditure plan of the organisation.

3.3.0 SOURCE OF FUND:

Sources of fund available with any organisation to meet the above expenditure are mainly the following two

3.3.1. Own fund :

This can again be subdivided into

- [a] Equity
 - i) Ordinary shares
 - ii) Preference share
 - iii) Reserves
 - iv) Convertible debentures
 - v) Capital incentives
 - vi) Developmental loans
- [b] Unsecured loan from friends and relatives

3.3.2. Borrowed fund :

This can be sub divided into

- [a] Term loan (5 years and above)
- [b] Debenture and bonds
- [c] Fixed deposit
- [d] Secured loan
- [e] Leasing
- [f] Supplier credit
- [g] Secured deposit

3.4.0. COST OF FUND (CAPITAL):

Cash for any capital expenditure project can be generated from the above two sources mainly own fund and borrowed fund. The process of obtaining the required capital from the different sources at the optimum cost is called capital gearing. The cost of this investment may vary depending upon the source. The borrowed fund will have interest rates that again may vary from source to source. Cost of own fund is generally the dividend a particular company is paying. This depends upon the paying capacity of a particular company. The weighted average cost of own fund and borrowed fund of a particular company is called the cost of capital. Any investment decisions as far as capital expenditure is concerned depends upon the cost of capital to be employed and the return this particular investment will yield over a period of time. Therefore, the cost-benefit analysis of an investment is the key factor in evaluating an investment proposal.

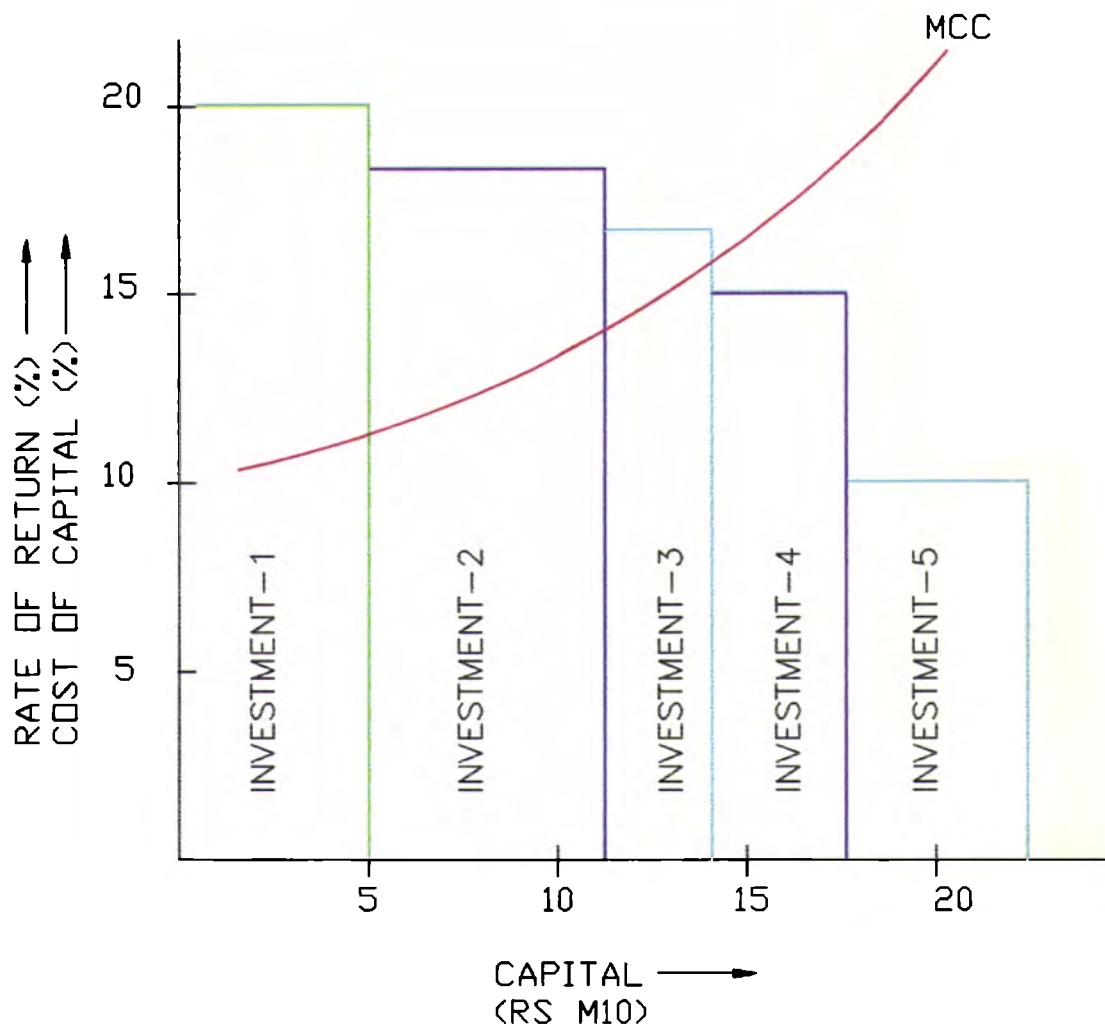
Exhibit 3.2 shows the relationship of capital and cost of capital⁽²⁾. The marginal cost of capital is the cost of the firm for obtaining various amounts of capital. The marginal cost of capital is a gradually rising function because most firms are required to pay a higher cost to obtain increasing amounts of capital. When a firm borrows funds, the more it borrows the greater is the risk that it

(2) Petersen H Craig and Cris Lewis W; Managerial Economics; Third Edition, Prentice Hall of India, New Delhi, 1995. p.500.

EXHIBIT - 3.2

MARGINAL COST OF CAPITAL

(RELATIONSHIP BETWEEN CAPITAL AND COST OF CAPITAL)



may fail to to repay the lender. To compensate for taking that additional risk, the lender must cash a higher return which is, accomplished by increasing the interest rate charged to the firm. The exhibit shows that the firm will make investments 1,2 and 3 because the rate of return exceed the cost of capital of these projects.

Exhibit 3.3 shows the relationship between cost of capital and gearing ratio⁽³⁾ Cost of debt increases as the ratio of debt to asset increases. Similarly, cost of equity also increases with the increase in debt to asset ratio. But it can be seen that average cost of capital is declining as the percentage of capital is raised as debt increases. It shows that average cost of capital (a) declines at a faster rate as the firm moves from zero debt to positive amount of debt (b) hits a minimum and then (c) rises as an increase in the level of debt drives the firms risk portion beyond acceptable levels Thus there is an optimum amount of debt for each firm i,e an amount of debt which minimises the cost of capital and thereby maximises the value of the firm.

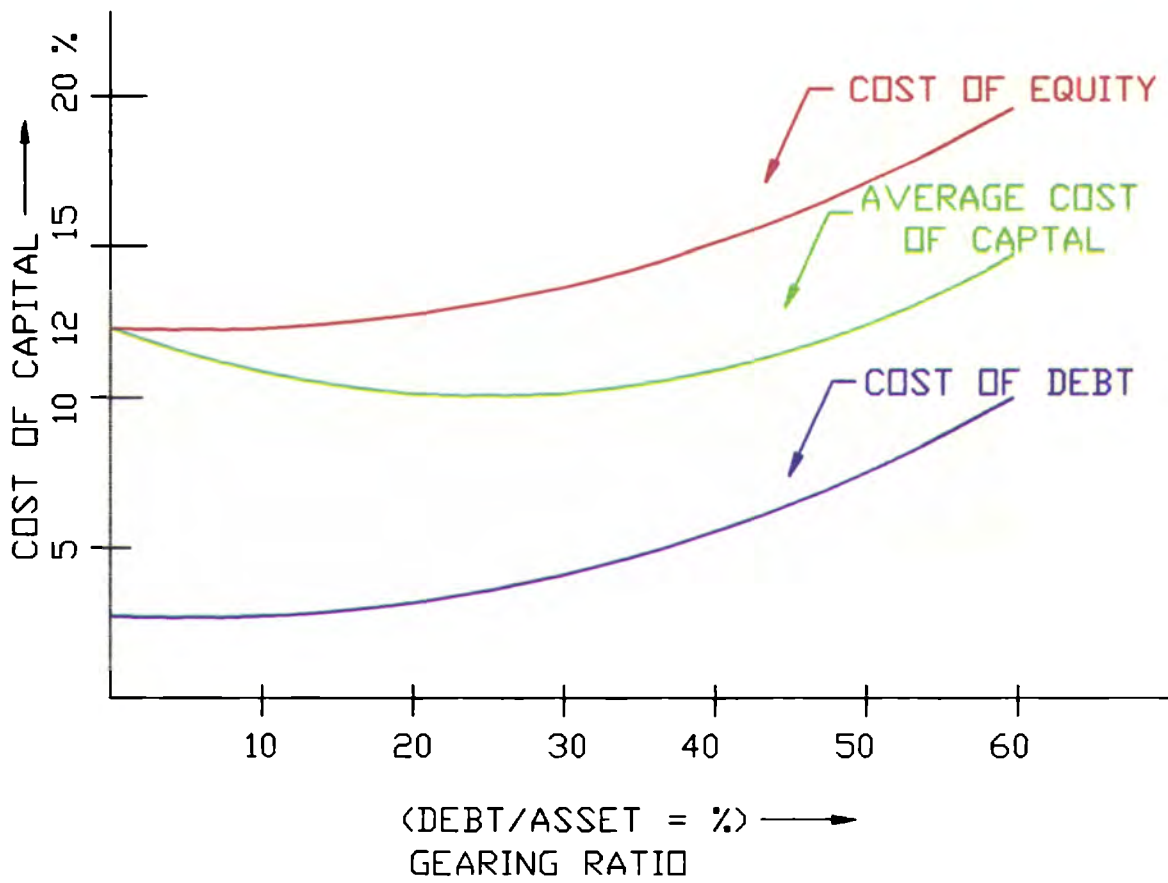
3.5.0. CAPITAL EXPENDITURE ANALYSIS AS A SYSTEM :

Capital expenditure analysis may be regarded as a system because it has a specific purpose, is a part of larger system and is interdependent with the other systems. Capital expenditure analysis may be veiwed as a sub

(3) J.F.Pappas, E.P.Brigham and B.Shipey; Managerial Economics; Rinehard and Winston, London, 1983. p.489.

EXHIBIT - 3.3

COST OF CAPITAL AND GEARING RATIO
(AVERAGE COST OF CAPITAL)



system of the financial management system which in turn is a sub system of the firm, which again is a part of the industry system. The objective of capital expenditure system is to provide information necessary for the effective management of capital expenditure. A system is essentially a set of relationship. The relationships are shown in Exhibit 3.4 (4)

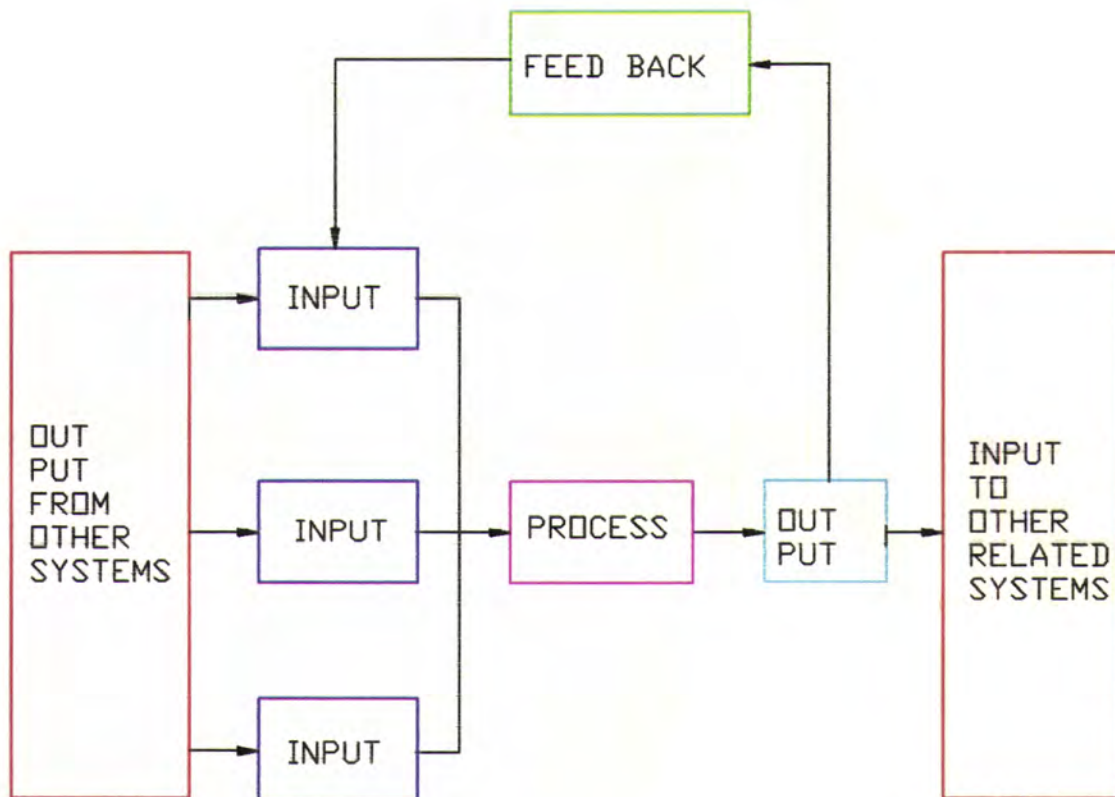
The absolute essentials of a basic system model consists of an input, a process and an output. Feedback and control components are essential for the effective monitoring of the system. In considering any capital expenditure proposal, the inputs may include such information as capacity, cost, expected cash inflows, timing of cash flow information about alternatives and the accuracy of estimates. The process represents what is done with the input until it becomes an output. It includes all administrative and economic evaluation aspects of capital expenditure analysis like establishing priorities for the order in which proposals are to be analysed, the method or combination of methods and techniques of evaluating capital expenditures used and evaluation report and their distribution. The output of the capital expenditure analysis system contains information about the proposal like the probability of the proposed investment, recommendations for its approval or rejection, the best timing for its implementation and some indication of the type of risk involved.

(4) Moustafa H. Abdulsamed; A Guide to Capital Expenditure Analysis; op. cit. p.13.

EXHIBIT - 3.4

SYSTEMS RELATIONSHIP

(CAPITAL EXPENDITURE SYSTEM'S MODEL)



The advantages of viewing capital expenditure analysis as a system are:-

- [1] For improving the system, change in the inputs or in the process are needed. This means that lack of perfection in the estimate (input) does not justify using inefficient methods of evaluation (process)
- [2] The output is dependent upon the inputs. Using wrong estimates of cash flows will result in the wrong measure of the economic worth of the proposed investment.
- [3] The value of the output should exceed the value of the input.

Feedback is required so that inputs can be adjusted to ensure that the output is an effective input to the next related system. A concept of control is needed to ensure that the necessary adjustments are made in the input side.

3.6.0. RULES & GUIDELINES AND FALLACIES WITH RESPECT TO CAPITAL EXPENDITURE ANALYSIS

The following are the general rules, guidelines and common fallacies with respect to capital expenditure analysis.

3.6.1. Capital expenditure includes more than fixed asset

Capital expenditure may be defined as any large expenditure for which benefits are expected to be realised over a long period of time (more than one year) This means that the expenditure must be large. The exact minimum

amount may vary from organisation to organisation like operating expenditure for which the benefits extend over a short period of time, the benefits from a capital expenditure extend over a number of years. As a corollary to this, a capital expenditure is distinguished by being irreversible, in the sense that once a decision is made, it can not be reversed or it can be reversed only at a very high cost. So defined a capital expenditure does not have to result in an increase in a fixed asset. This means that an expenditure for a major advertising campaign should be treated as a capital expenditure as long as it is above the established minimum amount and the benefits are expected to be realised over a period longer than a year. Other examples include research and development programmes, long term training and development programmes and early retirement of long term debt.

3.6.2. Capital expenditure Analysis includes Administrative and Economic Aspects :

Capital expenditure analysis is generally divided into Administrative procedure and Economic evaluation. Administrative procedures include written policies and procedures, authorisation and approval levels, establishment of minimum amount for considering an item as a capital expenditure, post audit, preparation of capital budget and training in capital expenditure analysis. Administrative procedures may differ from one company to another but a good administrative set up is prerequisite to an effective capital expenditure evaluation system.

The purpose of economic evaluation is to provide information that indicates the economic consequences of investment decisions. This information pertains to alternatives consisting of the proposed expenditure with other plans of the company and its goals, an evaluation of the reality of the estimate provided, the degree to which the proposal meets the established financial criteria and the possible consequences of failure of the proposal to realise its estimated benefits.

The four major steps of economic evaluation are :-

- 1) Project generation
- 2) Project evaluation
- 3) Project selection and
- 4) Project execution

Every department at the time of initiation of capital expenditure proposal will generate many proposals, may be a "Wish list" This wish list, a possible list of proposals, are to be selected for further study At the project evaluation step, not only the quantitative methods but also the qualitative methods and judgement methods are used to evaluate various proposals. The execution step is concerned with the carrying out of the project, the method of dealing with any deviation from plans and follow up reports. Post audits provide the feed back link necessary to assume continuous improvement of the capital expenditure analysis system through identifying past mistakes and areas that needs corrective action.

3.6.3. Classify capital expenditures whenever possible :

Classification of the capital expenditure is the process of grouping similar capital expenditures into separate categories or classes. This type of classification allows grouping similar items together which helps in summarising the expenditure for budgeting purposes.

3.6.4. Consider future cost and not sunk cost :

Sunk cost is the cost which is already incurred and hence it is irrevocable. Any sunk cost of past decision should not be considered for evaluation of capital expenditure proposals, but only future costs are relevant.

3.6.5. Consider only future benefits and not past benefits :

Benefits are inflows of income or advantages resulting from an investment like cost saving, additional revenue, or profit. Economic conditions, competitors' strategies, consumers' tastes and the state of technology are only a few of the many facts that should be considered when estimating benefits. Regardless of the form of benefits for capital expenditure analysis purpose, the only relevant benefits are future benefits and not the past benefits.

3.6.6. Make computation on an after tax basis :

Income tax is a reality and must be included in any analysis of capital expenditure proposals that needs to be meaningful. Tax treatments are not always identical from one proposal to another and hence ignoring taxes could lead to wrong conclusion, about the profits or the true worth of an investment.

3.6.7 Consider the time value of money :

The concept of the time value of money, which means simply that one rupee received today is more valuable than one rupee to be received tomorrow or any time later, is to be considered in evaluating capital expenditure proposals.

3.6.8. Quantify whenever possible, but do not over do it :

An attempt should be made to estimate cost and benefits quantitatively, but the quantitative analysis should not be forced upon every people without regard to whether or not the resulting estimates are meaningful. Generally capital expenditure proposals will contain information in narrative form under the following heads:-

- a) Present situation This explains what is the present situation, what is wrong with the present situation, how and why it is inefficient, why it is unsatisfactory and what is the problem of continuing the present situation.
- b) Proposed project This describes purpose, scope and back ground of the proposed project and its relationship to the long range plans of the organisation.
- c) Alternatives Here the possible alternatives are tested and it is to be mentioned out why they were rejected in favour of the chosen plan.
- d) Timing This should caution the consequences of delaying the project for some time, in terms of cash flow return on investment etc.
- e) Economic justification: Generally, a capital expenditure project should have an economic justification. If not,

the reason for not including the economic justification is to be included.

3.6.9. Avoid excessive necessity type of expenditure :

A necessity type of project should be the exception rather than the rule. It is always suggested to take care of the excessive type of the necessity classification as a way of "beating the system" Capital expenditure proposals so classified should be reviewed carefully to assure that they are in reality necessary, urgent and indispensable and to guard against using the necessity classification as a free pass for unprofitable "pet" proposals.

3.6.10. Do not subscribe to the profit illusion :

The general concept is that if a firm is making satisfactory profit, the capital expenditure evaluation system of that firm is perfect, is not necessarily true. It is possible for a firm to have an obsolete and ineffective capital expenditure analysis system and yet to be profitable The profit might have achieved because of excellence in other areas. Profitability and the adequacy of a capital expenditure analysis system are not synonymous; one can exist without the other.

3.6.11. Benefits from the analysis should exceed costs :

The cost of analysis should be less than the expected benefits to be derived through selecting better proposals because of the additional information. Therefore extensive study and more detailed analysis are usually needed for major projects, routine and minor projects need not be

given the same extensive treatment. This does not mean that inefficient ways of analysing proposals for minor projects are advocated, but rather that the analysis should not be carried beyond its marginal returns.

3.6.12. Do not shy away from profit maximisation :

Common objectives of capital expenditure proposals are

- 1) Maximising short term and long term profits
- 2) Maximising opportunities
- 3) Increasing the market share of the company
- 4) Achieving the highest possible return to share holders investment.
- 5) Maximising the present value of the share holders wealth
- 6) Assuming the social responsibilities of a good community citizenship
- 7) Building a good company image
- 8) Boosting employee morale etc.

Objectives of capital expenditure vary from organisation to organisation The general criteria to be considered for the evaluation of capital expenditure proposal are:-

- 1) Long range objectives
- 2) Government regulations
- 3) Capacity
- 4) Cost and financial returns
- 5) Personal considerations

The overall objective of capital expenditure is usually profit so as to stay in business. The word "usually" is inserted here to allow for undertaking investment that contribute in intangible ways (i.e., employee morale) and investments required by outside authorities like Pollution Control Board, Factories Inspectorate, Electrical Inspectorate etc,

3.6.13. Consider alternatives when ever possible :

In every internal situation there are at least two alternatives, do something or do nothing. The study of alternatives may reveal opportunities or guard against mistakes. The analysis should concentrate on the most promising alternatives to enable the decision maker to select the best and eliminate unnecessary effect of considering the obviously poor or far less promising alternatives.

3.6.14. The use of project concept whenever possible :

The project concept means that all investments that are to be undertaken together or that are part of a larger project should be studied as one unit.

3.6.15. Use a multitalent approach whenever possible :

Capital expenditures, by their very nature, may require many talents to evaluate their worth. The bigger and more involved in the project, the more the need for different talents to evaluate it. Very large projects may require the help of outside consultant.

3.6.16. Capital expenditure analysis is both an art and a science :

It is a science as there is a well established body of theory and techniques that can be employed. It is an art as it is not a purely scientific exercise in a controlled experiment. The excellence of an analysis depends in large part on the subjective judgement of the decision maker on his experience, on his ability to raise the right questions and on his way of integrating all the piece meal data before reaching a decision.

3.6.17 There is no substitute for good judgement :

All methods and techniques of the capital expenditure evaluation are intended to enhance the judgement of operating managers and decision makers, they are in no way a substitute for it, but rather they complement it. An individual's knowledge in the theory of investment analysis will not give him a lead role in the analysis with out some experience in actual practice. Of course a person with adequate knowledge of the theory could acquire the necessary experience in a short time.

3.6.18. Do not overtake the human side of the enterprise :

No system, no matter how perfect it is, can work without the co-operation and support of the people involved. The resistance to change may be reduced by participative management and an explanation of why a change is needed. Human relations can not be overlooked in any job that involves dealing with people.

3.7.0. CAPITAL EXPENDITURE EVALUATION :

All capital expenditure proposals involve cash outflows for procuring or constructing an asset. It will start returning the cash, called cash inflows once the production is started with this asset. Therefore every capital expenditure has got cash outflows and cash inflows. Selecting one proposal from various proposals available is done by evaluating the benefits of various proposals and identifying one proposal which will give maximum benefits to the organisation. The following are the evaluation methods used to appraise the capital expenditure proposals.

- 1) Pay back method
- 2) Accountant rate of return method
- 3) Discounted cashflow method
- 4) Net present value method
- 5) MAPI method

3.7.1. PAY BACK METHOD :

Pay back method is the most commonly used method of investment analysis, not only among the small and less proficiently managed firms, but also among the largest and most successful corporations.

The pay back method (also known as the year to pay back, the pay off, the pay out, the cash recovery period, and the return period) is used for measuring the attractiveness of a capital expenditure proposal. The time needed to receive the benefit equivalent to the initial investment is the pay back period. In other words, given a certain amount of investment, the pay back period is simply

the time required to recover this investment through the expected stream of benefits. From various similar proposals, a proposal with the shortest pay back period is often selected.

The pay back period is a time concept. It does not measure profitability but rather how fast the investment will be recovered. The fact that one investment has a shorter pay back period than another investment does not guarantee that the former investment is more profitable than the later. If any generalisation is to be made, it is more sensible to assume that long lived investments could and should earn more than short lived investments. By its very nature, the pay back method has a built in bias against longer lived investments with initially small but constantly increasing benefits. In other words, use of pay back method could lead to investing capital in short lived investments at the expense of more profitable, long and intermediate lived investments.

The pay back period could be arrived at by a process of division or subtraction. The division method of computing pay back is acceptable, when the annual cash inflows are uniform. When cash inflows vary from year to year it is better to subtract the cash flows from the investment starting with the first year and proceeding until the declining investment figure reaches zero. The number of years required to get the investment back to zero is equal to the pay back period. Normally depreciation and other similar deductions from income that did not

result in cash outlays are added back to the figure of net income to arrive at cash flows.

The pay back period does not consider cash flows after the investment is recovered. Thus proceeds and any salvage value that occur after the payback period are usually ignored in the computations, although the profitability of an investment is dependent upon them.

The pay back method does not consider the time value of money. In our world where interest exists, a rupee recovered today should be treated as worth more than a rupee to be received tomorrow or any time later.

The pay back method may provide some indication of risk. The assumption here is that the longer the pay back period, the more chance that things would go wrong. In so far as providing one clue to indicate an element of risk, the pay back is useful. However to say that the pay back offers a full measurement of risk is incorrect.

3.7.1.1. Usefulness of pay back method :

The pay back method becomes an ideal measure of desirability of an investment in situation in which the speed of recovering the investment is critical. The other usefulness are the following :-

- 1) When a company has cash problems.
- 2) When the product selling lasts for a short period of time.
- 3) When the proposed investment is known to have a high degree of obsolescence.

- 4) When the order for the product may be cancelled on short notice.
- 5) When the possibility of adverse government action exists.
- 6) When required to compare very poor or very good investments.
- 7) When the investments are small and the cost of using more sophisticated methods of analysis exceeds the possible benefits.
- 8) When the estimates of cash flows are unreliable and the life of the proposed investment is undeterminable.

3.7.1.2. Advantages of pay back method:

The advantages of pay back method, which is still a popular method of evaluation are the following

- 1) Easy to understand
- 2) Simple in use
- 3) Well known
- 4) Easy to sell to operating personnel
- 5) Easy to sell to top management
- 6) Low in cost
- 7) Easy to post audit
- 8) Requires few assumptions
- 9) Can be used for evaluating different types of investment proposals.

3.7.2. ACCOUNTANT RATE OF RETURN :

The accountant rate of return method which is designed to measure the attractiveness of a proposed capital expenditure is a measure of profitability whereas the payback method is a time concept. This method compares

the annual expected benefits from an investment with the amount to be invested in a project and expresses this relationship as a percentage return on investment. Accountant rate of return method is also known as simple rate of return method, average rate of return method, the average annual return on investment method etc. The two features commonly shared by all versions of accountant rate of return are, using accounting concepts in determining benefit and making no adjustments for the time value of money. The objective of using this method is to obtain a figure that represents the rate of return expected to be earned on a proposed investment. The rate is determined by dividing income figure by an investment figure. The accountant rate of return calculated by this method is considered superior to the pay back method, not only because it measures profitability, but also because it usually includes the proceeds after pay back and it allows ranking investments according to their respective returns. Further more, the computed return could be compared with an established minimum to determine the degree of attractiveness of a proposed investment.

There are at least 864 possible ways of computing the accountant rate of return. Differences exist because of the wide variance in ways of determining the benefits and the investment.

Benefits can be defined as first year's income, each year's income or an average income. Income may be before or after depreciation. The depreciation may be calculated

as straight line or declining balance method. The income may also be figured before or after deducting a financing cost for use of capital and before or after corporate taxes.

The investment may be defined as the original investment, the average investment for a given year or the average investment for the life of the project.

The salvage value of the old investment, as an after tax figure, should be deducted from the new investment to get the incremental cost of the new project.

To summarise, there are a number of ways of computing the accountant rate of return. No single approach is considered absolutely right or absolutely wrong. Once the decision is made to follow certain approach it should be continued.

The pay back reciprocal (average cash inflow divided by investment) is used by some firms to measure returns on investment. This is very similar to accountant rate of return but not exactly the same as the benefits usually refer to cash flows and not to accounting income.

Because of the differences between capital expenditure analysis (future oriented) and actual performance analysis (historically oriented) the accountant rate of return is not considered a generally acceptable method of evaluating capital expenditure proposals.

The time value of money is ignored by the accountant rate of return method. This represents a serious short coming of the method since all benefits regardless of timing are treated equally. Under unusual conditions of having uniform benefit and a short investment life, mistakes in computing rate of return are not critical. However highly unreliable results can occur when the life of the proposed investment is relatively long and the benefits from the proposal are not uniform. Moreover, the accountant rate of return (ARR) is not readily comparable with the cost of capital since it ignores the time value of money.

It is often agreed that ARR method makes the task of post auditing capital expenditures from the normally kept book of accounts an easy one. The books of accounts are usually designed for reporting events with reference to accounting period and for profit centres and they are not usually designed for reporting on single investment and thus the ease of post auditing projects evaluated by accountant rate of rate return method is more a myth than a reality.

3.7.2.1. Advantages of ARR :

- 1) Easy to understand
- 2) Simple to use
- 3) Very popular among accountant
- 4) Easy to sell to operating personnel
- 5) Easy to sell to top management
- 6) Easy to post audit (certain cases it is illusionary)
- 7) Low in cost

- 8) Can be used for evaluating different types of investment proposals
- 9) Analyses future data and not historical

3.7.2.2. Weaknesses of ARR :

- 1) Ignores time value of money
- 2) Depends excessively on accounting concept

3.7.3.0. DISCOUNTED CASH FLOW RATE OF RETURN (DCFR)

DCFR method is generally referred as one of the most theoretically advanced and efficient methods of evaluating capital expenditure. This discounted cash flow rate of return method is also called as discounted rate of return method, yield method, the investor's method, the initial rate of return method and the industrial rate of return method.

DCFR is that rate of interest that discounts the expected proposal (may be called as the present value of inflows) to an amount equal to the initial investment. It is that interest rate that will equal the present value of cash inflows (benefits) with the present value of cash outflows (investment) thus making the net present value of all cash flows (present value of cash inflows less present value of cash out flows) equal to zero.

3.7.3.1. Characteristics of DCFR :

- 1) Time value of money This means that a differentiation is made between cash flows received at different portion or period of time. Before adding cash flows to be received at different times they

are adjusted. This adjusting process is called discounting. In an economy in which interest and opportunities for investment exist, a rupee received today could be invested to earn money immediately. There is a price for waiting to receive benefits; the longer we have to wait, the more return we should expect on our money.

- 2) The process of trial and error The rate of return by the DCFR method is determined by trial and error method.

- 3) Cash flow and not accounting income An investment is basically an exchange of immediate Cash (expenditure) for a future stream of cash (benefit) that extends over a number of years to come. Until benefits are received in the form of cash they should not be considered as realised because, until they are received in cash they cannot be reinvested at face value. For DCFR purposes cash payments are all that matter and not accounts receivable or other transitory forms before cash is received.

- 4) Do not deduct depreciation Each cash flow includes a capital recovery and a return on the capital used. To deduct depreciation from cash flows would mean allowing for the recovery of the asset twice, once as part of the DCFR computation and again through deduction for depreciation.

- 5) Do not deduct charges for financing It is not necessary to deduct finance charge from the cash

inflows because that will result in double consideration of these charges, once when comparing the rate of return with the minimum cut off or desirable rate and again when figuring net cash flows.

- 6) Always deduct tax Cash flows should be determined net, after all taxes. Taxes have to be paid in cash there by qualifying as cash outflows.

3.7.3.2. Advantages of DCFR method :

- 1) Time value of money This method allows time value of money
- 2) Cash flows DCFR method is based on cash flows and not accounting income.
- 3) Ranking proposals: The use of DCFR method results in a consistent system of ranking and selecting investment proposals and hence it is easier to select from these proposals.
- 4) Mistakes in later years The discounting process reduces the inputs of errors in estimating very distant future values, such as cash flows in later years or salvage value
- 5) Proper treatment of taxes Taxes affect cash flows and cash flows are used in the computations, consequently they are considered.
- 6) Comparability with the cost of capital The rate of return computed by the DCFR method may easily be compared with the cost of capital. This is found to be true because the DCFR method computes a rate of return and that rate is computed on the outstanding or used part of capital.

- 7) Familiarity with rate of return concept Top management and operating personnel are familiar with the rate of return language used in financial circles. It is similar to the amortization of debt Also it is easier to interpret and understand a rate of return
- 8) Easy to continue updating Initial cost of starting DCFR method is high but little effort and few costs are required to keep the system going once it is installed.
- 9) More complete analysis This method encourages more in depth analysis of capital expenditures.

3.7.3.3. Disadvantages of DCFR method :

- 1) Need for education and training Many people are uncomfortable with compound interest discount. Because of common resistance to change and the need not only to learn the new method but to unlearn the old, much time and effort are consumed.
- 2) Heavy demand on analysis staff personnel It is true that more time of the analysis staff are required for this method. But now a days, computers are available to do the job faster.
- 3) Difficult to compute with accounting data Since the accounting books are not usually kept on a cash flow basis or on a project basis, it is not easy to compare the actual with the external cash flows for an investment project.

- 4) Revising policies and procedures It is necessary to change forms, procedures and manuals to accommodate the introduction of the DCFR method.
- 5) Multiple Yields Under extreme conditions of having unconventional cash flows, DCFR may result in more than one rate of return on the same investment.
- 6) The reinvestment assumption DCFR is not a return on the initial investment but on the outstanding amount of investment.
- 7) Over emphasis on allocation of capital DCFR over emphasises the scarcity of capital where as capital is not so scarce to obtain.
- 8) DCFR cannot be used under all conditions DCFR does not always result in selection of the best investment when the alternative proposals have different lives. Also this does not result in the correct selection of projects from among mutually exclusive investments (if one is selected the others have to be rejected)
- 9) Inflation DCFR method does not deal with the problem of inflation.

3.7.3.4. Misuses of DCFR method :

- 1) Decision should not be based on small differences in rates of return among projects as DCFR is calculated based on estimates.
- 2) DCFR takes into account the time value of money but it does not consider the risk of the project.
- 3) Education and training if less, will beat this method.

- 4) All projects regardless of their nature can not be evaluated by using DCFR.

3.7.4. NET PRESENT VALUE METHOD :

Net present value (NPV) method is similar to discounted cashflow rate of return (DCFRR) method, but rather than finding the rate of return that equates the cash outflows with the cash inflows, it discounts the cash flows at an assumed (required or desired) rate of return. Through the discounting process the present value of the benefits is determined. Then the initial investment is subtracted from this present value to determine the net present value of the investment. A positive NPV indicates that the proposed investment is profitable. The net present value method is also known as net present worth method, present worth method and discounted cash flow by the present value method.

In terms of popularity, the NPV method may be placed after the pay back, accountant rate of return and DCFRR method and before the MAPI method. Thus the NPV ranks fourth among the five commonly known methods of evaluating capital expenditure. From a theoretical view point the NPV method is considered by many writers in the field (such as Harold Bierman and Seymour Smedt)⁽⁵⁾ to be more desirable than and far superior to the DCFRR method. From a practical view point, however NPV is less known and less commonly used than DCFRR method. The net present value method expresses the attractiveness of a proposed

(5) *ibid.* p.96

capital expenditure in rupee terms. The selected rate for discounting the cash inflows may be some form of the cost of capital to the firm or an arbitrary figure. That represents the minimum return below which an investment would be undesirable. If the NPV is positive the investment is considered desirable. A negative net present value indicates that the proposed investment would not be able to generate the minimum rate required for capital expenditure. The main difficulty associated with using the net present value method lies in determining the rate of discount to be used in calculations. A logical rate to be used is the cost of capital.

A cash flow diagram showing the typical calculation of NPV method for an investment of Rs.9500 (cost = Rs.8000 and installation charges = Rs.1500) and cash inflow of Rs.2500 every year for 5 years is shown in Exhibit 3.5⁽⁶⁾

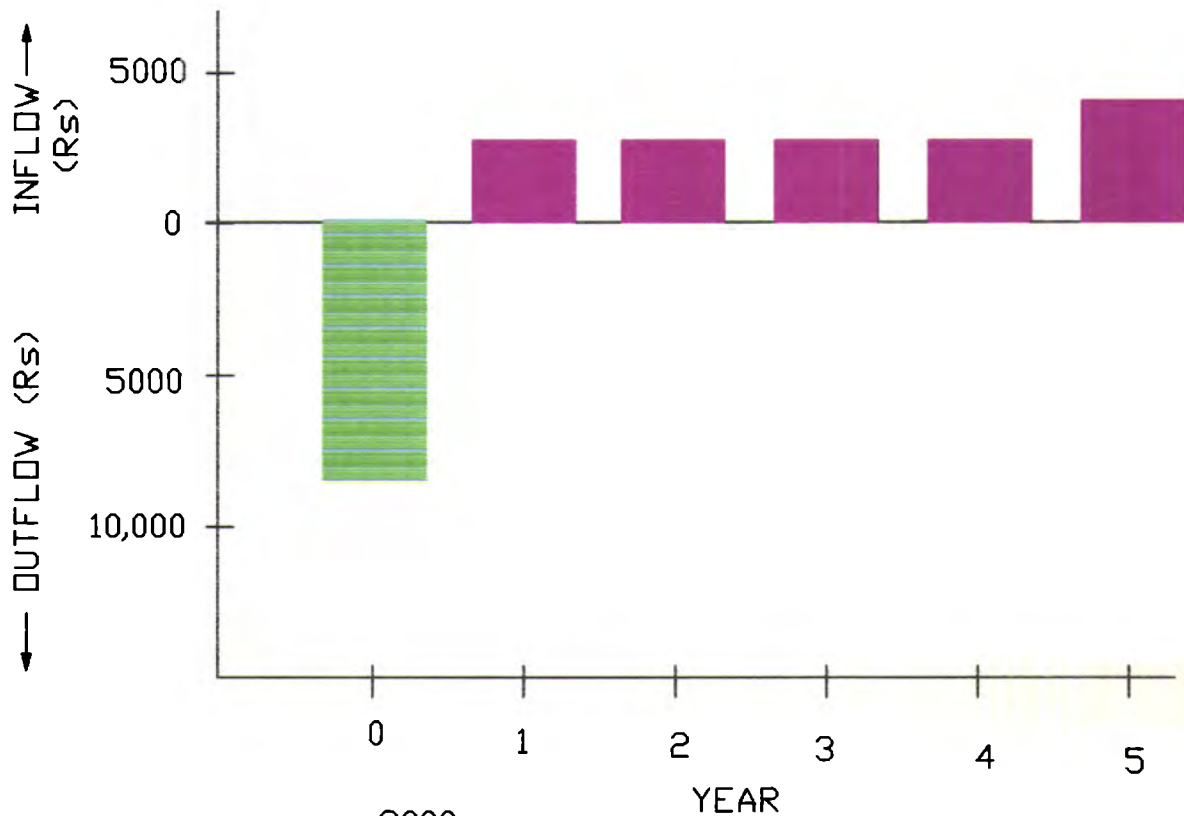
3.7.4.1 Characteristics of NPV method :

- 1) Ease of computation Once the discount rate is decided, computation of discounted cash inflows, cash outflows and hence net present value is very easy.
- 2) Dependence on cost of capital NPV is calculated based on a minimum rate of return. If this minimum rate is the cost of capital the method becomes more meaningful.

(6) Robert N. Anthony and James S. Reece; **Accounting Principles**; Richard D Irwin Inc., Illinois.
1991. p.551

EXHIBIT - 3.5

CASH FLOW DIAGRAM



CASH OUTFLOW

COST 8000
 INSTALLATION 1500
 SALE OF OLD (500)

TOTAL INVESTMENT 9000

CASH INFLOW

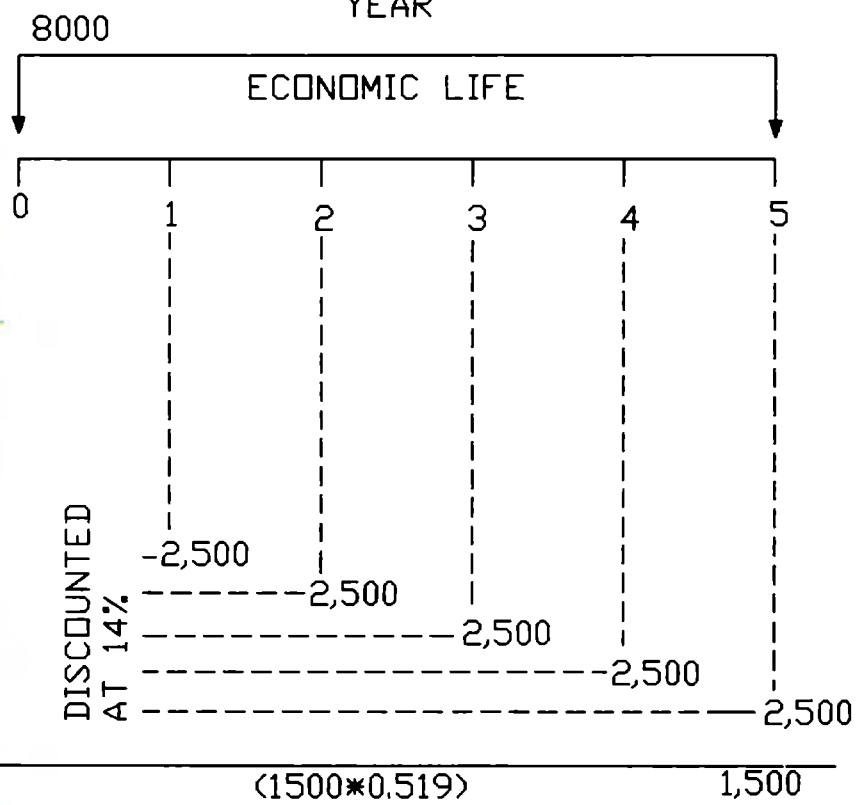
YEAR

1
 2
 3 8,853
 4
 5

RESIDUAL VALUE 779
 YEAR-5

TOTAL INFLOW 9,362

DIFFERENCE=NET
 PRESENT VALUE=Rs. 362



- 3) NPV for different types of investment proposals:
Unlike DCFR, from which it is possible to obtain more than one rate of return on the same investment, there is only one NPV figure for an investment at a given discount rate or interest rate. NPV is used for evaluation even if there is an assorted combination of positive and negative cash flows. Also NPV method is far superior to the DCFR method for selecting among mutually exclusive investment proposals with significantly different useful lives. Projects that can be accepted or rejected regardless of the action taken on any other investment now or later are called independent investment. Projects that preclude one another, one project is accepted, the others become unavailable or inappropriate are called mutually exclusive projects⁽⁷⁾
- 4) Time value of money Time value of money is considered in evaluation.
- 5) Cash flows NPV method uses the superior concept of cash flows (not accounting income) in the analysis.
- 6) The reinvestment assumption The re-investment assumption poses no significant problem with the NPV method because the cash flows are discounted at the desired rate.
- 7) Difficulty of interpreting the profitability measure: The NPV method measures the profitability of

(7) Diana R. Harrington; Corporate Financial Analysis- Decisions in a Global Environment; Fourth Edition, Richard D Irwin Inc., 1993. p.131.

a proposed investment. But the end is an amount as net present value and not a rate of return. Businessmen usually feel more at ease with a rate of return that can be compared with market rates, rather than amount.

- 8) Insensitivity to the required investment One of the main arguments against the NPV method is that a net present value by itself may not tell the whole story about the profitability of a capital expenditure proposal. To overcome such an argument a profitability index was developed.

3.7.4.2. The Profitability Index:

The profitability index (P.I) also known as benefit-cost ratio, desirability index or discounted profitability index is the ratio of the present value of cash inflows (benefit) divided by the present value of the cash outflows (investment). By this method it is possible to compare one project with another. A profitability index of one means that the present value of benefit is exactly equal to the present value of investments. A P.I. of more than one indicates that the proposed investment is profitable and less than one indicates that the project is not profitable. A criticism against P.I. is that it is insensitive to the size of net benefits.

3.7.4.3 Advantages of NPV method :

- 1) Considers time value of money.
- 2) For evaluating different types of investment proposals
- 3) Accurate.

4) Analyses future data and not historical.

3.7.4.4. Weaknesses of NPV method :

- 1) Difficulty in selling to operating personnel.
- 2) Difficult to compare with accounting data.
- 3) Difficult to sell to top management.
- 4) Unnecessarily complicated.
- 5) Imposes heavy demands on analysis staff.

3.7.5. MAPI METHOD :

The Machinery and Allied Products Institute (MAPI) method, developed by George Terborgh in 1949 is one of the five basic methods of evaluating capital expenditure proposals. His objective has been to make it more effective more useful and simple to use but at the same time he has sacrificed some simplicity for the sake of greater realism and comprehensiveness.

MAPI method is regarded as a sophisticated rate of return method and it computes an after tax return called the MAPI rate of return MAPIR. This after tax return is a measure of profitability. It measures the return on the average investment over the comparison period, most frequently one year. When one year comparison period is used, it measures the after tax rate of return if the investment is undertaken now versus the alternative of waiting one more year before making the investment. Proposals may be ranked according to their rate of return Also the rate of return may be compared with the cost capital to determine the attraction of a proposed investment.

Effective management of capital expenditure requires a periodic review (usually annually) of the facilities for determining the time that a replacement is needed. It means that once a year the question to be asked is "Is it advisable to replace each investment now or wait for another year and repeat the analysis then ?" Another reason for using the one year basis is that one year is the typical accounting period for financial reporting and capital budgets are usually prepared annually.

$$\text{MAPIR} = \frac{\text{Average benefit}}{\text{Average investments}}$$

Generally MAPI method is used in evaluating minor capital expenditure projects.

The above formula is modified by George Terborgh later and the 1967 model MAPI rate of return (after tax) may be expressed as follows:-

$$\text{MAPIR (after tax)} = \frac{a+b-c-d}{X}$$

Where a = next year or average operating advantage
i.e., the sum of the increase in revenue and reduction in operating cost resulting from the project compared with the operating results that would be obtained in its absence.

b = next year or average capital consumption
avoided

i.e., the difference between the initial
investment

(If any) in the alternative and the amount remaining at the end of the year.

c = next year or average capital consumption incurred i.e., the amount by which the remaining use value (retention value) runs off during the year (the cost of the project being taken as the initial value)

d = next year or average income tax adjustment i.e., the after tax return from a project is simply the pre tax return reduced by the tax percentage. The adjustment itself is the net increase in income tax resulting from the project.

x = average net investment i.e., the average of the net investment at the beginning and at the end of the year. The initial net investment is the installed cost of the project less the initial investment in the alternative. The terminal net investment is the retention value of the project at the end of the year, less the disposal value of the alternative.

The following are the useful information that the 1967 version of MAPI formula can give :-

- 1) Amount of net gain i.e., after tax incremental profit if the project is under taken.
- 2) Return on equity investment
- 3) The cash throw off i.e., the amount of investment that will be recovered in cash annually and pay back period.

3.7.5.1 Characteristics of MAPIR

The following are the key characteristics of MAPIR :-

- 1) It is a measure of profitability.
- 2) It does take care of time value of money, but the comparison period being one year, the importance of discounting is not very serious.
- 3) This takes into consideration the factor of obsolescence in equipment through retention value.
- 4) It provides a more complete analysis of capital expenditure than that provided by pay back and accountant rate of return methods
- 5) This method is not generally considered biased towards immediate purchase of equipment.
- 6) Generally this method is accurate.
- 7) It analyses future data - not historical
- 8) It forces management to think over investment ideas throughly.

3.7.5.2 Weaknesses of MAPI method :

The following are the weaknesses of MAPI method :-

- 1) Difficult to sell to operating personnel
- 2) Unnecessarily complicated
- 3) Impose heavy demands on analysis staff
- 4) Difficult to sell to top management
- 5) Difficult to compare with accounting data
- 6) Places too much emphasis on estimates

3.7.6. EVALUATION METHODS IN PRACTICE :

Majority of firms use combination of those methods rather than one method exclusively. It can be said that DCFR is an accurate method and it takes care of the value of money. Also it analyses future data and can be used for evaluating different types of investment proposals. Except pay back method, all methods measure profitability. None of the method fully measure risk.

3.8. SENSITIVITY ANALYSIS :

Sensitivity analysis is a technique designed to measure the response or change in the profitability of a project as a result of changes in the key factors that effect a project's cash inflows and cash outflows. The first step is to identify key factor. The second step is to initiate some change in one key factor at a time and measure the effect of this change on the profitability of the investment. The third and final step is to summarise the findings in either tabular or graphic form. A key factor common to sensitivity studies is price level changes.

Sensitivity analysis can warn regarding very risky proposals where a small change in key elements would have large effect on the profitability of these proposals. Also it can help to identify areas where additional information is needed to improve the estimates of selected items.

3.9. RISK ANALYSIS:

Risk analysis is an extension of sensitivity analysis. Sensitivity analysis points out what would happen to the profitability of a proposal if some changes in the estimates of key factors occurred. It does not address itself to the question of the profitability of occurrence of such changes. Risk analysis is an extension of sensitivity analysis that explicitly takes into consideration the probability of changes in the estimate of key factors and the combined effect of these changes.

On the basis of the information collected through risk analysis it is possible to

- 1) Accept the proposal
- 2) Reject the proposal and
- 3) Collect additional information

Risk analysis techniques, by collecting information that helps to reveal the risks involved in different capital expenditure proposals, aid in classifying proposals according to their risk. Then proposals of similar risks may be grouped together and evaluated accordingly

3.10. POST AUDIT :

Post audit is a comparative study of the estimated and actual results of capital expenditure projects. Post audit studies refer to

- 1) Collecting data on the actual results of the project

- 2) Comparing actual results with those estimated in the proposals and determining the difference between actual and forecast results and
- 3) Studying these differences

Post audits are also known as follow up studies, performance audit, post completion studies and post mortem.

3.10.1. Reasons for post audit :

- 1) Knowledge gained from past project provides a necessary feed back that helps to improve future decisions.
- 2) Post audits have psychological effect that encourages proponents of proposals to submit realistic estimates.
- 3) When it is known that results will be revealed, goals of proposals serve as a challenge for every one concerned to achieve them.
- 4) Post audits serve in evaluating the performance of operating management.
- 5) Audits help to identify good estimators and decision makers.
- 6) Post audits serve in detecting personal bias.
- 7) Post audit can pin point trouble areas and give warning when corrective action is required.
- 8) It may reveal other investment opportunities.

3.10.2 Weaknesses of Post Audit :

Weaknesses of post audit are the following :-

- 1) If carried to an extreme, Post audit may encourage submitting only fully realisable proposals, which can result in the loss of valuable opportunities.
- 2) Post audits are expensive and hence it is to be used only when it justify the cost.
- 3) Post audit is not a replacement for complete analysis of project.
- 4) Post audit can be subjected to manipulation.
- 5) The fear of using the results for punishment can hinder the success of any post auditing programme.
- 6) Accounting data is not suited for providing information required for post audit.
- 7) Post auditor should have thorough knowledge in the field.
- 8) Delayed post audit will not be realistic.

CONCLUSION :

The large value of the usual capital expenditure may be regarded as both an evil and a blessing. It is an evil in that mistakes made here are very expensive and can result in the failure of an enterprise. It is a blessing in that a very small percentage improvement can result in a large rupee saving. By the same token, the small percentage saving gained through improvement in capital expenditure evaluation can justify a large expenditure to modify the system. The cumulative effect of investment decisions by individual firms involves

employment, economic activity and economic growth. Thus a progressive programme of capital expenditure analysis in a business firm may not only shape the future of the individual firm, but also, affect the economy as a whole.

There are good many Indian companies which are following very strict discipline particularly in the area of capital expenditure. In public sector industries also, well discussed plans are made, but when it comes to practice, lot of delays, problems and road blocks are being faced. For the delays faced during implementation of capital expenditure, intelligent excuses are expressed at all levels for not getting the things done in time. In this research attempt, the difference in approaches to capital expenditure by public sector and private sector companies are being studied.

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CHAPTER - IV

CHAPTER IV

PUBLIC SECTOR ENTERPRISE

The previous chapter has explained the techniques of evaluating capital expenditure. This chapter narrates the origin of public sector enterprises in India and their present position.

Before independence, Indian economy was basically an agrarian economy with a very weak industrial base, low level of savings and investments. It also lacked infrastructural facilities. Majority of the population was poor and unemployed.

During the colonial rule the Indian Industrial Commission (1916) had recommended that in future the Government should play an active part in the industrialisation of the country. The Government of India took over the management of Indian Railways in 1922, which is considered to be the origin of Public Sector in India (1) Later the second world war provided a great impetus to the expansion of war industries, when India's economy was placed on a war footing and a period of controls and regulations began. Earlier in August 1937, the Indian National Congress in power in some states, thought of

(1) R N Chopra; Public sector in India - It's Performance, Profitability and Industrial Relations; Intellectual Publishing House, New Delhi.1984. p.1

formulating a tentative policy of industrialisation for the country. A National Policy Committee was set up by the Indian National Congress in 1938 under the Chairmanship of Pandit Jawaharlal Nehru. The committee prepared blue prints for a planned economic development in various states, laying an informal basis for the emergence of the Public Sector on a large scale. In 1942 The Hindustan Aircraft Ltd., was taken over by the Central Government. A year later, Telephone Companies of Bombay and Calcutta were taken over. The Overseas Communication system was also taken over for public operation.

In 1944, the Government of India set up a Planning and Development Department. A statement on Industrial Policy was made by Lord Warell in 1945 prescribing that all ordinance factories, public utilities, railways and basic industries of key importance should be nationalised. The overall aim was to take positive steps to encourage and promote industrialisation of the country to the fullest extent possible.

After independence, it was felt that direct participation of the public sector in the national economy was a necessity, especially in the capital intensive areas. It was, as experts now explain, a pragmatic compulsion to deploy the public sector as an instrument of self reliant economic growth. This was necessary to develop the agricultural and industrial base, diversify the public economy and to overcome economic and social backwardness. Over the years, public sector industries in India have proliferated into various fields as evident from the

growth, expansion and diversification of the public activities and the increase in the shares of the public sector in the total plan outlays.

In the post independence period the Industrial Policy Resolution of 1948 recorded a radical departure from the "LAISSEZ-FAIRE" economic policy followed by the British and envisaged Government controls of twenty big industries. The logic of this was stated as under:-

"When the mass of the people are below the subsistence level, the emphasis should be on the expansion of production. There can be no doubt that the state must play a progressively active role in the development of industries." (2)

The Constitution of India adopted on 26 January 1950, directed the state to secure that the ownership and control of material resources of the community were so distributed as best to resolve the common good and that the operation of the economic system did not result in the concentration of wealth and means of production to the common detriment of the people.

Table 4.1 shows the share of Public and Private Sector Enterprises under the various Five Year Plans. (3)

(2) *ibid.* p.2

(3) A N Agrawal, H O Varma and R C Gupta; India - Economic Year Book - 1995; *op cit.* p.319

Table 4.1
Share of Public and Private Sector in Five Year Plans

Plan -----	Share in the Plan Outlay	
	Public Sector -----	Private Sector -----
	%	%
First Five Year Plan (1951-56)	46.4	53.6
Second Five Year Plan (1956-61)	54.6	45.4
Third Five Year Plan (1961-66)	60.6	39.4
Annual Plans (1966-69)	n.a	n.a
Fourth Five Year Plan (1969-74)	60.3	39.7
Fifth Five Year Plan (1974-79)	43.3	56.7
Sixth Five Year Plan (1980-85)	47.8	52.2
Seventh Five Year Plan (1985-90)	45.7	54.3
Eighth Five Year Plan (1992-97)	45.2	54.8

Source: Plan Documents

The Industrial Policy resolution of April 1948 classified industries into the following four categories:-

- Category I - Strategic industries like arms and ammunitions, atomic energy, river valley projects, and railways.
- Category II Coal, iron and steel, aircraft ship building, communication equipment and mineral oil.
- Category III - Fertilizers, chemicals, road transport and machine tool.
- Category IV - Private sector - all the remaining industries.

The first three categories were the responsibilities of the state and the rest of the industries were left to the private sector. Five public sector enterprises with an investment of 29 crores of Rupees in 1951 was the beginning.

The first Five Year Plan indicated the need for a rapid expansion of the economic and social responsibilities of the state which did not need to involve complete nationalisation of the means of production or elimination of private agencies in agriculture, business and industry.

Only a progressive widening of the public sector and a reorientation of the private trader to the needs of planned economy was envisaged. The plan stated that "the distinction between public and private sectors was only of relative emphasis and private enterprise should have a public purpose and major expansion of private enterprise could rarely be undertaken except through the assistance of the state in one form or another - the private functioning of enterprises only on the basis of unregulated profits was already an anachronism - the private and public sectors can not be looked upon anything like two separate entities; they are and must function as parts of a single organism"

On 21 December 1954, the Lok Sabha resolved after a debate that the objectives of India's economic policy should be to establish a "Socialistic Pattern of Society" The second Five Year Plan elaborated that the benefits of economic development must accrue more and more to the relatively less privileged classes of society and there should be progressive reduction of the concentration of income, wealth and economic power. For creating the appropriate conditions the state has to take on heavy responsibilities as the principal agency speaking for and acting on behalf of the community as a whole. The public sector has to expand rapidly to initiate the development which the private sector was either unwilling or unable to undertake; it has to play the dominant role in shaping the entire pattern of investments in the economy.

The second Industrial Policy Resolution of 1956 realigned the industrial policy of the country by broadly enunciating the philosophy underlying public operation of industries and services. It says; "In order to realise the objective, it is estimated to accelerate the rate of economic growth and to speed up industrialisation and in particular to develop heavy industries and machine making industries to expand public sector and to build up a large and growing co-operative sector. This will provide the economic foundations for increasing opportunities of gainful employment and improving living standards and working conditions of the mass of the people. The adoption of the socialist pattern of society as the natural objective, as well as the need for planned and rapid development, require that all industries of basic and strategic importance or in the nature of public utility services should be in public sector. Other industries which are essential and require investments on a scale which only the state in present circumstances could provide have also to be in the public sector.

Like in 1948 resolution, industries were classified into 3 categories:-

- 1) Industries where further development was to be exclusively in the public sector - 17 such industries were named.
- 2) Industries which were progressively to be state owned and in which the state will generally take the initiative in establishing new undertakings but in which private enterprise will also be expected to

supplement the efforts of the state - 12 such were named.

- 3) Comprising all the remaining industries, the further development of which was left to the initiative of the private sector though it was open to the state to start any industry in this category.

The Government of Independent India under the leadership of Pandit Jawaharlal Nehru had taken policy decisions to

- a) improve agriculture
- b) to develop the country's basic and capital goods industry through establishment of large and heavy industries.
- c) enlarge manufacture of mass consumption goods and create opportunities for employment and
- d) develop infra structure for rapid industrial development.

Planned development through the medium of five year plans was adopted as an instrument of policy. Jawaharlal Nehru took another basic decision viz., that at the initial stage of development of Indian economy would have to be structured on the mixed economy pattern, which means that while there would necessarily be a massive and progressively dominant share of the Government in economic development, the private sector would still have a significant place for initiative in entrepreneurship.

The Second Five Year Plan emphasised the interdependence of the public and private sectors and

referred to investment in the public sector - like in power, irrigation and transport which would increase the production potential of the private sector. By the middle of 1961, the Third Five Year Plan laid down that the public sector was to grow relatively, as well as absolutely and the private sector had to develop in terms of Government Policies and was not to be impeded in any way in its contribution to the growth of the economy. The public sector was intended to prevent concentration of economic power and growth of monopolistic tendencies.

The subsequent plans also reiterated the above policy. There was continuous emphasis on making the private sector imbued with public purpose. The Fourth Plan however envisaged the emergence of the public sector as "the dominant and effective area of the economy, to take charge more and more of the commanding heights in the production and distribution of basic and consumer goods."

The Industrial Policy announced on 23 December 1977 envisaged the public sector as a means of socialising the means of production in strategic areas and for providing counter acting force to the growth of large houses and large scale enterprises in the private sector. The Government was also to operate it on profitable and efficient lines to ensure an adequate return on investment made.

Though not defined so clearly, the expectation under Articles 39 to 43 of the Constitution of India was that Government participation in industry and trade would imply

a speedy conduct and management of economic activity, with the simplification of decision making at all levels and the willingness of the top echelons to assume responsibility, coupled with decentralisation of authority. With efficiency and quick despatch of business, production would improve in government hands throwing up large revenues in the shape of profits in the overall available for further investment.

A public sector enterprise is by definition, an enterprise where there is no private ownership, where its functions are not merely confined to the maximisation of profits or the promotion of the private interest of the enterprise but are governed by the public or social interest and where the management is responsible to the Government either directly as in departmental undertakings or indirectly as in Government companies and corporations.

The public sector in India was instituted to enable the economy to achieve "Commanding heights"⁽⁴⁾ The role of the public sector was quite clearly envisaged to be in areas where either the private sector was unable to venture because of large size of investment required or where the social welfare objectives were very different from private objectives.

(4) S P Gupta; Liberalisation - It's Impact on the Indian Economy; MacMillan India Ltd, New Delhi, 1993, p.98

The general objectives of public sector enterprises are:-

Promote critical development in terms of social change and strategic value rather than primarily on considerations of profit;

and, provide commercial surpluses with which to finance economy development.

The macro objectives⁽⁵⁾ that form the frame work with in which public enterprises have to function, have been laid down as :-

- 1) To promote the rapid economic development by filling the gaps in the industrial sector.
- 2) To provide the basic infrastructure for the growth of the economy.
- 3) To undertake economic activity strategically important for the growth of the country, which, if left to the private initiative would distort the national objectives.
- 4) Balanced regional development and dispersal of economic activity through the growth and diversification of economic activity in less developed areas by providing an adequate infrastructure and undertaking programmes on conservation and development to national resources.

(5) Besant C Raj; Public Enterprise Investment Decisions in India - A Managerial Analysis;
op cit. p.110

- 5) To reduce disparities in income.
- 6) To avoid concentration of economic power.
- 7) To have social control and regulation of long term finances through public financial institutions.
- 8) Control over sensitive areas allocation of scarce imported commodities, wholesale trade in agricultural commodities, especially food grains, control over the distribution of essential goods in order to reduce the margin between the prices obtained by the producers and those paid by the consumers.
- 9) Self reliance in different technologies through the development of capability for design and development of machinery, equipment and instruments and the elimination of dependence on foreign agencies for their services.
- 10) To create employment opportunities on an increasing scale.
- 11) To increase exports.

It is often heard that in Public Sector Enterprises there is no "goal congruence", and there is neither goal specificity or role clarity. Moreover, everybody feels that somebody will take the decision, may be due to lack of role clarity or due to fear of failure and ultimately nobody takes the decision.

From 1951 onwards till 1989-90 financial outlay totalling Rs.787,591 crore has been invested in development projects, Rs.368,876 crore in the public sector and Rs.418,715 crore in the private sector⁽⁶⁾ The annual development plans for 1990-91 and 1991-92 were of the order of Rs.107,993 crore and Rs.118,501 respectively. These huge sums have been distributed among the heads of development like Agricultural and Allied activities, Energy, Industry and Minerals, Transport, Communications, Science and Technology and Environment, Irrigation and Flood Control, Rural development, Special Area programmes, Housing and General Economic Services etc, In the Eight Plan (1992-97), out of a total outlay of Rs.798,000 crore, investment in public sector will be Rs.434,100 crore, while the private and household sectors' investment in various projects will account for the balance.

The Government of India announced a new Industrial Policy in July 1991 which contains the following four major decisions in respect of the public sector.

- 1) Reduction in the list of industries reserved for the public sector from 17 to 8 and introducing selective competition in the reserved areas.
- 2) Disinvestment of shares in Public Sector enterprises to raise resources and encourage wider participation of general public and workers in the ownership of public Sector enterprises.

(6) P K Joy; Total Project Management - The Indian Context; op cit. p.1

- 3) Policy for sick public enterprises to be same as that for the private sector and
- 4) Improving performance through contract or Memorandum of Understanding (MOU) system by which managements are to be granted greater autonomy and held accountable for results.

The Industrial Policy Statement opened up nine of 17 industries hitherto reserved for the public sector for private investment and participation. This step is expected to augment the flow of investible resources to priority sectors and at the same time enhance competitiveness and efficiency in these sectors. While the mixed character of our economy will remain, public sector units will focus more on strategic areas in keeping with the original intention.

The Eighth Plan visualises an important role for an autonomous and effective public sector in providing essential infrastructural and strategic support for achieving the targeted rate of economic growth during the plan period (1992-97)

The plan document enumerates the following policy initiatives in this regard:-

- 1) Restructuring involving modernisation, rationalisation of capacity, product mix changes and selective exit and privatisation.
- 2) Increase in autonomy and performance accountability through an effective system of MOU's between

administrative ministries and public enterprises launched since the Seventh Five Year Plan.

- 3) Changes in management in specific enterprises to promote leadership, resourcefulness and innovation.
- 4) A major effort by the State Governments to streamline the working of their public sector enterprises which are beset with interference and adhoc investment and employment decisions.
- 5) Technological upgradation through an integrated R & D effort and import of technology.
- 6) Re-orientation of approach in Ministries and other Government agencies corresponding to liberalisation and dismantling of regulations (Price, distribution, investment and import controls) to develop a new institutional capability to facilitate operations of market forces, orchestration of integrated R & D effort and evolution of consenses and partnership among various stake holders.

Public Sector Enterprises constitute a major national capability in terms of their scale of operations, coverage of the national economy, technological capabilities and stock of human capital. There are over a thousand public enterprises, about 700 of which are owned by the states. The rest are in the Central Sector. These include departmental undertakings (eg. Railways, Post and Telecommunications), financial institutions (eg. The State Bank of India, The Industrial Finance Corporation of India, The Unit Trust of India and The Industrial Development Bank of India) and non-departmental enterprises or Government Companies or corporations which are either incorporated

under the company law (eg. Steel Authority of India and The Indian Petrochemical Corporation ltd.) or statutorily created by Acts of Parliament (eg. Coal India, Air India, Indian Airlines and the National Thermal Power Corporation) Non departmental enterprises account for 25 percent of value addition, more than 50 percent of gross investment and about a third of the total employment on PSE's. PSE's contribute the entire output in the case of petroleum, lignite, copper and primary lead; about 98 percent of zinc; well over 90 percent of coal; more than half of steel and aluminium and about one third of fertilisers.

Non departmental PSE's have thus been an important sector of our economy and have dominated infrastructure and basic industries. Over the decade, their production activity has been perhaps over diversified and extends from steel making and oil refining to manufacture of bread and footwear. This has been the result of a number of circumstances and has diluted the original strategic and commanding heights of objectives of PSE activity. Infrastructural or producer services are dominated by public sector corporations in transport, energy and communications. PSE's also operate in diverse service sectors such as international trade, consultancy, contract and construction services, hotels and tourist facilities etc,

As on 31 March 1992⁽⁷⁾ there were 246 central public sector enterprises (excluding 8 companies with central Government investment but with out direct responsibility, for management, 6 insurance companies and 3 financial institutions) Of these, 9 were in the construction sector, 72 in services and 165 were engaged in manufacture.

The number of enterprises increased from 179 in 1980 to 246 in 1992 and the investment increased from Rs.181 billion to Rs.993 billion. They produced goods and services worth Rs.995 billion. Their net profits were low, about Rs.38 billion. The net profits to capital employed ratio was as low as 5.8 per cent in the manufacturing sector and barely 1.5 per cent in the service sector.

The central public sector enterprises operate in 21 cognate groups⁽⁸⁾ These cognate groups include areas of national importance and high social returns. These enterprises can be categorised as enterprises set up by the Central Government and those taken over from the private sector. Out of 187 enterprises set up by the Government 64 are loss making units, 29 of which are chronically sick.

(7) Government of India; Economic Survey of India - 1992 - 93, p.146

(8) S P Gupta; Liberalisation - It's Impact on the Indian Economy; op. cit. p.98

The minimum required rate of return in Private sector projects are generally assessed using three criteria⁽⁹⁾ namely (a) the return obtained by the firm from the present investment (b) the average return obtained by other companies in the same industry and (c) the cost of capital to the company. These criteria can not be used for determining the discount rate for the public sector projects. The present rate of return can not be used as most of the public sector units in India report very meagre profits, and in many cases only losses, from year to year. The average rate of return in the industry can not be used, as in a number of cases, there are no corresponding projects either in the public sector or private sector enterprises. Finally the Manual on Feasibility Studies points out that the interest rate on loans to a project can not be used as they do not measure the true cost of capital in a developing country like India. In view of this the Manual suggests the use of alternative estimates of cost of capital or desired rate of return established elsewhere. A reference is made by the Manual to the Reserve Bank of India study wherein the cost of capital to the Government has been estimated at 12 percent. It also invites attention to the Parliamentary memorandum of the Fourth Five Year Plan wherein a 12 percent return is suggested as a desirable rate for the public sector industries. The Manual observes that this figure could be used as a discount rate in present worth calculations, although there seems to

(9) Besant C Raj; Public Enterprise Investment Decisions in India - A Managerial Analysis;
op. cit. p.117

be a need to establish different rates for different industries.

Over the last 48 years the growth of the public sector enterprises has been phenomenal in terms of investment, production and range of activities. The public sector enterprises now number 1166, 246 in the central list and 920 in the state list⁽¹⁰⁾ In 1989 - 90, the public sector accounted for 36 per cent of employment and owned 49 per cent of the capital employed in the corporate sector and it contributed 18.7 per cent to national income.

Exhibit 4.1 shows the increase in employment in public sector in comparison with private sector⁽¹¹⁾

Lord Morrison, the father of the concept of public enterprises in U.K., has said that public corporation "Must have autonomy and freedom of business management"

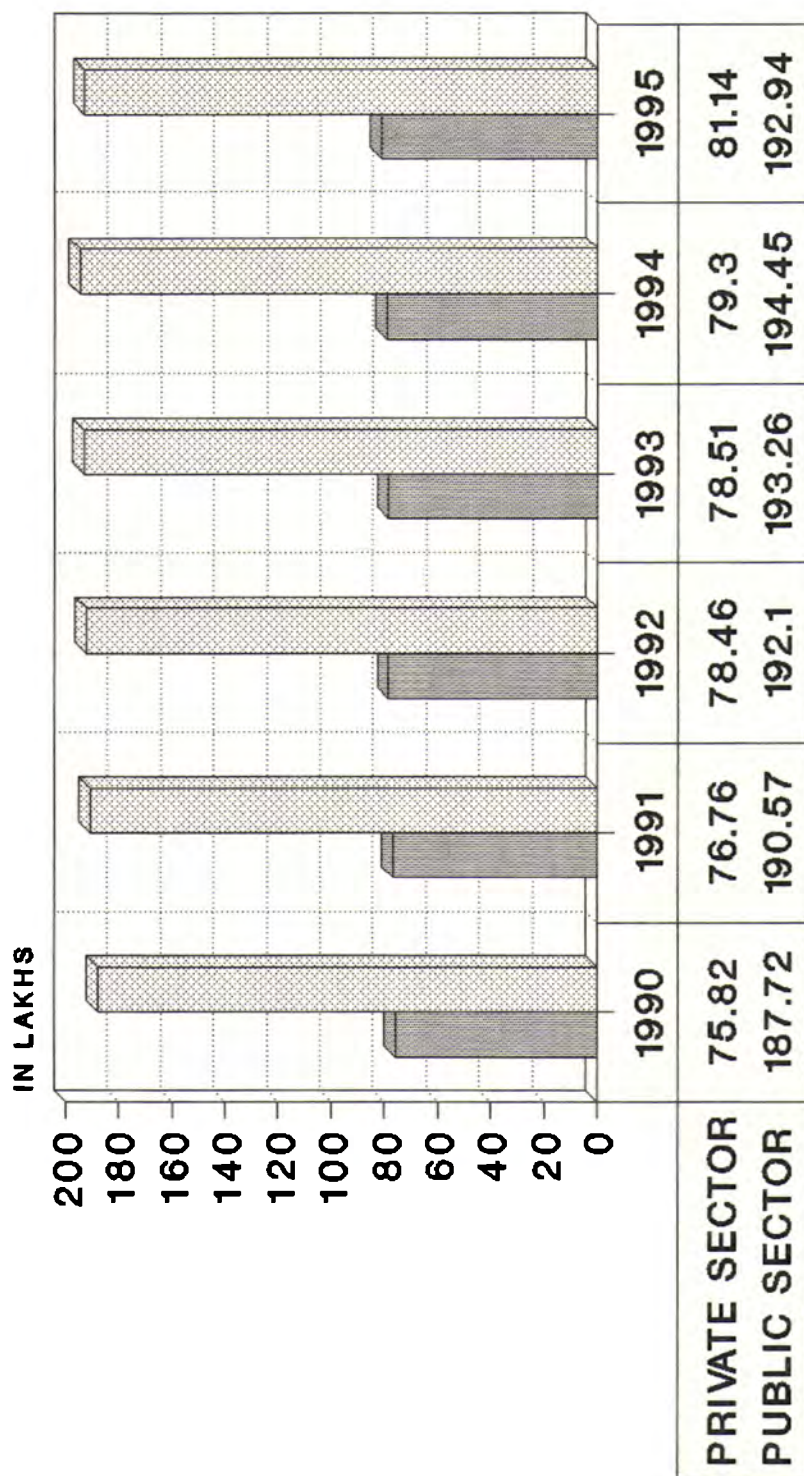
Pandit Jawaharlal Nehru, the first Prime Minister of India and the father of the concept of the public sector in India has once said in our Parliament that "We have to evolve a system of working public enterprises, where, on one hand there are adequate checks and protections and on the other, enough freedom for the public enterprise to work

(10) S P Gupta; Liberalisation - It's Impact on the Indian Economy; op. cit. p.98.

(11) The Economic Times
27 September 1996

EXHIBIT - 4.1

INCREASE IN EMPLOYMENT IN PRIVATE SECTOR & PUBLIC SECTOR COMPANIES



PRIVATE SECTOR
 PUBLIC SECTOR

Source Ministry of Labour

quickly and with out delay Ultimately it has to be judged by the results" Unfortunately, the result was exorbitantly poor. The core sectors as Jawaharlal Nehru conceived during the first and second five year plans, became liabilities to the nation. The poor exchequer has to bear the consequences in terms of increased taxes and duties.

The committee on Public Undertakings has expressed the view that unless the public sector enterprises contribute to the rapid growth of GDP and generate substantial internal resources for future investment the country can not move forward quickly. Most of the public sector undertakings have unusually long gestation period, very low level of production or under utilisation of assets and the consequential escalation of cost of projects and their processes.

Public sector in India has grown in a haphazard manner. Except for some vague statements about its objectives, the philosophy of public sector has never been properly defined or strictly followed. What all things have been done, it is a reality that most of the public sector enterprises are a burden rather than a support to the poor Indians.

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CHAPTER - V

CHAPTER V

PRIVATE SECTOR ENTERPRISE

In the previous chapter on public sector enterprise, the evolution of public sector enterprise in India and its present position are explained. This chapter gives an insight into private sector enterprise.

Privatisation has caught the imagination of people everywhere. Privatisation may be defined as a process by which the people of a country can in democratic fashion, participate in the development of their economy and thereby partake of the resultant prosperity in a proportion that is commensurate with their contribution. Our economy is at cross roads. We have built a substantial industrial infrastructure. Agricultural production has kept pace with our internal requirements. Exports have grown tremendously but so have imports. Technological sophistication, while not yet in the international league, is far better than ever before. The fear of rampaging inflation constantly stalk the economy. Prosperity is within grasp and yet millions of our people barely survive. It has been demonstrated world wide that privatisation has ushered in a new era of profitability.

Growth of external debt every year by geometric progression, low export growth, worsening terms of trade and a decline in real wealth in most developing and many almost developed countries have shaken the stronghold of ideology on economic policy. Along with this, there has been the growing realisation that the increased presence of government in economies has not contributed to prosperity and social justice. On the contrary, it is now widely accepted that the public sector has become a "mill stone" around the necks of the governments and people alike.

The British have clearly emerged as the champion privatiser. Their success has made London a Mecca for would be privatisers - more than 20 countries have been guided by the British Treasury. Starting from Mrs.Thatcher's time, Britain effectively transferred 600,000 workers, say 33 percent, of the workforce from the public sector to the private sector. This has contributed \$26 billion to the British Treasury. National Truck Consortium, British Telecom, British Gas Corporation, etc., are some of the few giants that went to privatisation. Even in Japan, privatisation has started its roots starting from Nippon Telegraph and Telephone. Even Bangladesh has launched one of the largest scale privatisation efforts in the world. Over 600 state companies have been handed over to the public since 1975.

The evolution of industries in the world can be considered to have the following stages:-

Stage I Family firms

Stage II	Domestic/Regional firms
Stage III	Domestic/National firms (medium size)
Stage IV	Domestic/National firms (large size)
Stage V	Multi - domestic
Stage VI	Multi - National
Stage VII	International

The above classification shows that private sector industries were in operation much before the public sector. Enterprises in the private sector were managed by families and their backgrounds have been in trading and not in manufacturing industries. But now the trend has changed. Most of the private sector organisations are run by professionally qualified people.

The Industries Development and Regulation Act of 1951 and the Industrial Policy Resolution of 1956 laid down the basic principles of Industrial Policy in India. The Act of 1951 provided that all private enterprises required a licence [a] to set up a new unit, [b] to expand substantially an existing unit and [c] to change the product mix of an existing unit. Thus, since the passing of this Act, the government has sought to regulate the pattern of investment in virtually the whole of the large scale industrial sector through licensing. The resolution of 1956

demarcated the spheres in which industries were to be solely developed by the state, those to be progressively state owned, and those to be left solely for private enterprise to exploit. Private enterprise was expected to supplement state effort.

The objectives in industrial licensing⁽¹⁾ are :-

- [1] to enforce the planned investment pattern
- [2] to counteract trends towards monopoly and the concentration of wealth
- [3] to maintain regional balance in locating industries
- [4] to protect the interests of small producers and encourage the entry of new entrepreneurs and
- [5] to foster improvement in industry by ensuring the optimum scale of plants and the adoption of advanced technology.

Even in areas where private sector has been allowed their operations, developments have been regulated by the government in the public interest. The large industrial houses and foreign concerns particularly have been subject to a number of checks and controls⁽²⁾ Their role has been

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- (1) K D Gaur, P J Meshram and K L Shashidharan; Economy and Finance, Vol.3; Sarup & sons, New Delhi. 1993. p.113
 - (2) Francis Cherunilam; Industrial Finance; Himalaya Publishing House, Bombay. 1987 p.80

confined to certain important areas like the heavy investment sector, core sector, export sector and backward area development. The government policy is to prefer small and new enterprises to large industrial houses in the private sector, wherever possible.

The private sector is dominant in most of the consumer goods industries. It plays an important role in a number of capital goods industries too. In a number of important industries it functions side by side with the public sector.

In private sector enterprises there is an urgency to get things done. People are accountable and hence responsible. Authority is more. 'Hire and fire' is quite common. Achievement motivation is very high in private sector especially because achieved results will definitely improve the prosperity and growth of the individuals along with the industry. 'Numbers' are always measured. Action plans are 'man bound' and 'time bound' Reviews are for corrective and preventive action. 'Intelligent excuses' for not getting things done on time are seldom tolerated. Efforts put forth by the private sector are visible in the results. They have identified capital expenditure as the live wire for improvement, modernisation and hence growth.

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CHAPTER - VI

C H A P T E R V I

ANALYSIS

In the previous chapters, the concepts of Capital Expenditure, Evolution of Public Sector and Private Sector Enterprises etc., are explained in detail. This chapter covers the analysis done with the data collected from the questionnaire and schedule.

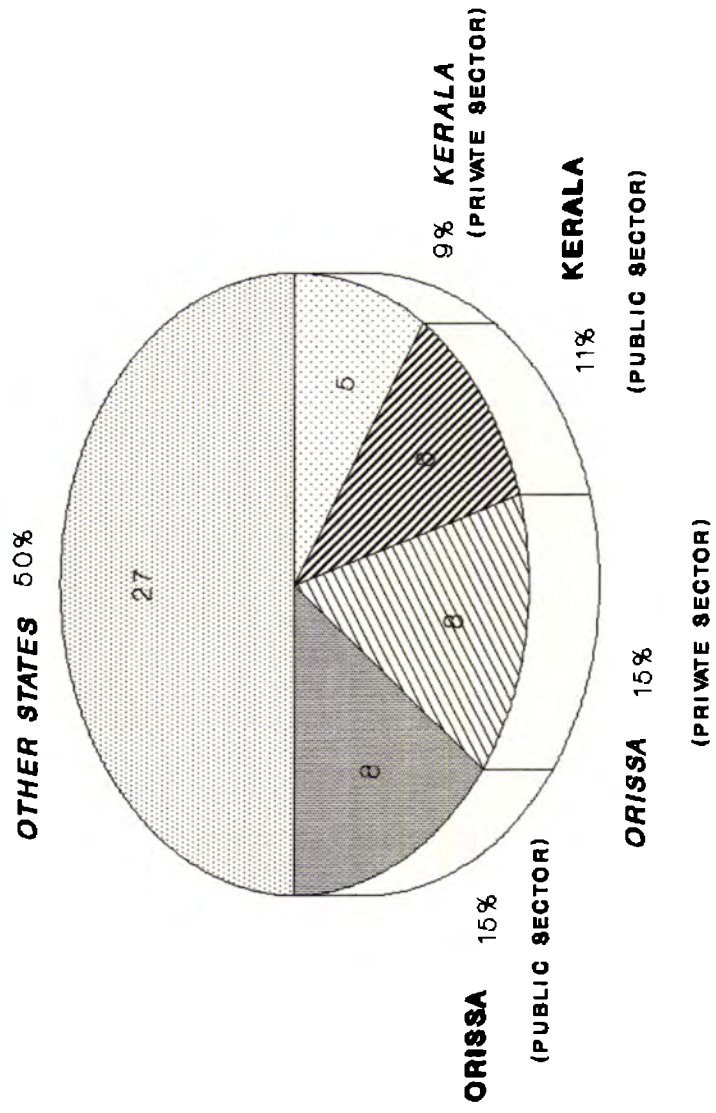
The number of companies covered by the study (from whom data could be collected) are shown in Exhibit 6.1.

The details of the companies covered in terms of paid up capital, number of employees, sales, capital expenditure etc., are given below:-

PAID UP CAPITAL

a) Companies in Kerala	Rs.521.88 Crores
b) Companies in Orissa	Rs.566.72
c) Companies in other states	Rs.1380.00
	—————
Total	Rs.2468.60 Crores
	=====

EXHIBIT - 6.1
NO. OF COMPANIES COVERED BY THE STUDY



SOURCE SURVEY DATA

NUMBER OF EMPLOYEES

a) Companies in Kerala	18,665
b) Companies in Orissa	66,096
c) Companies in other states	73,689
	<hr/>
Total	1,58,450
	=====

SALES PER YEAR

a) Companies in Kerala	Rs. 2,822.46 Cr
b) Companies in Orissa	Rs. 7,217.37 Cr
c) Companies in other states	Rs.16,662.88 Cr
	<hr/>
Total	Rs.26,702.71 Cr

ACTUAL CAPITAL EXPENDITURE PER YEAR

a) Companies in Kerala	Rs. 49.314 Cr
b) Companies in Orissa	Rs.127.53 Cr
c) Companies in other states	Rs.920.85 Cr
	<hr/>
Total	Rs.1097.694 Cr
	=====

6.1.0. COMPANIES OUTSIDE KERALA AND ORISSA

The 27 industrial units from outside Kerala and Orissa from which data were collected, were found out to be all private sector companies. To study the capital expenditure decision in these 27 companies, they are divided into high profit making companies and low profit

making companies. This could be possible by arranging the companies in the order of average profit achieved during the period of study. Average profit after interest and tax over average net sales is taken as the index for the comparison. Table 6.1 shows the companies in the order of profitability.

From the table it is found that the average profit after interest and tax over average net sales is 5.91%. Out of the 27 companies, 7 companies are found to be having profitability more than 5.91%. These companies are grouped as high profit making companies. The seven companies on the lower part of the table are grouped as low profit making companies. Capital expenditure decisions in high profit group is compared with the low profit group.

Table 6.1

Profitability of 27 companies covered under the study

<u>Company</u>	<u>Average sales</u> <u>(In Rs.Cr.)</u>	<u>Avg.profit</u> <u>(in Rs.Cr.)</u>	<u>Avg.profit</u> <u>On sale as %</u>
1.	664.93	137.86	20.73
2.	1011.0	189.33	18.73
3.	397.23	74.08	18.65
4.	658.39	67.45	10.25
5.	1626.53	143.195	8.8
6.	6.63	0.45	6.798
7	2791.16	166.156	5.95

8.	34.39	2.01	5.84
9.	264.44	14.378	5.43
10.	239.79	12.866	5.38
11.	58.37	3.067	5.25
12.	247.25	12.2	4.93
13.	780.48	38.4	4.92
14.	422.16	18.13	4.29
15.	27.1	1.11	4.1
16.	240.57	9.728	4.044
17.	3002.8	121.39	4.041
18.	82.08	3.11	3.79
19.	305.73	11.122	3.64
20.	126.225	4.47	3.54
21.	1521.19	46.822	3.08
22.	196.1	5.69	2.90
23.	4.27	0.124	2.89
24.	990.17	22.744	2.29
25.	973.8	18.0	1.85
26.	6.98	0.851	1.219
27.	22.08	(0.81)	(3.67)

(Figures in bracket denote loss)

Source: Survey data

For the purpose of this study, companies No.1 to 7 are classified as high profit making companies, where as companies No.21 to 27 are classified as low profit making companies.

6.2.0 The capital expenditure system prevailing in public sector and private sector is compared in 5 groups, namely companies in Kerala, Orissa, companies in aluminium industry, chemical industry and steel industry. Also, similar comparison is made between high profit making companies with low profit making companies among the 27 companies studied outside Kerala and Orissa.

The analysis of data is classified into 3 sections:-

1) The published data:

This consists of sales, profit, capital expenditure planned and achieved. These data are collected through questionnaire.

2) Parameters related to formulation of capital expenditure

The parameters analysed are time taken for planning routine capital expenditure and non-routine capital expenditure, evaluation methods used and their efficiency, detailed financial report or feasibility report. These data are collected through questionnaire and schedule.

3) Parameters related to implementation of capital expenditure

The parameters analysed are delay in implementation, increase in cost, frequency of review, project planning and scheduling, project monitoring, negotiation, computerised project management techniques, network techniques, return on expected gain and post audit. These data are collected through questionnaire and schedule.

6.3.0. PUBLIC SECTOR COMPANIES V/S PRIVATE SECTOR COMPANIES

The analysis is made in relation to the above three parameters.

6.3.1 Analysis of Published Data

The number of companies studied under the 5 groups as public sector and private sector are given below

<u>Group</u>	<u>Private sector</u>	<u>Public sector</u>
1.Companies in Kerala	05	06
2.Companies in Orissa	08	08
3.Companies in aluminium industry	02	02
4.Companies in chemical industry	06	03
5.Companies in steel industry	05	02

6.3.1.1.Average sales during the study period of all companies coming under various groups are given below.

<u>Group</u>	<u>Private sector</u>	<u>Public sector</u>
-----	Rs.Cr.	Rs.Cr.
1.Companies in Kerala	321.574	2573.14
2.Companies in Orissa	717.17	6500.23
3.Companies in aluminium industry	1898.30	1938.32
4.Companies in chemical industry	606.025	1143.49
5.Companies in steel industry	3633.37	4131.66
	-----	-----
Total	7176.439	16286.84
	=====	=====

Details are shown in Table 6.2

This shows that 5 companies having a total average annual sales of Rs.321.574 crores in private sector are compared with 6 companies having a total average annual sales of Rs.2573.14 crores in public sector in Kerala. Similar comparisons are made in other groups also. The study also shows that annual sales of companies covered by the study in the private sector is Rs.7176.439 crores, where as the public sector companies are having an annual sales of Rs.16286.84 crores.

Table 6.2

Companies in Kerala	Private sector	Public sector
	<u>Rs. Crores</u>	<u>Rs. Crores</u>
1	41.624	58.37
2	80.28	1320.86
3	33.91	273.53
4	145.76	813.46
5	20.0	56.5
6	-	50.42
	<u>Total</u>	<u>321.574</u>
		<u>2573.14</u>
Companies in Orissa		
1	124.75	18.45
2	57.38	16.38
3	58.47	29.24

4	114.63	52.66
5	40.78	10.14
6	25.41	1281.36
7	189.55	1013.0
8	106.2	4079.0
	Total	717.17
		6500.23

Companies in Aluminium Industry

1	887.3	1281.36
2	1011.0	656.96
	Total	1898.3
		1938.32

Companies in Chemical Industry

1	33.91	273.53
2	20.0	813.46
3	397.23	56.5
4	4.27	-
5	24.39	-
6	126.225	-
	Total	606.025
		1143.49

Companies in Steel Industry

1	114.63	52.66
2	40.78	4079.0
3	2791.16	-

4	264.64	-
5	422.16	-
Total	3633.37	4131.66
	=====	=====

Source: Survey data

6.3.1.2. Profit made by various group of companies are given below:-

Group	<u>Private sector</u>	<u>Public sector</u>
	Rs.cr.	Rs.cr.

1.Companies in Kerala	13.419	127.838
2.Companies in Orissa	36.1537	527.484
3.Companies in aluminium industry	251.26	230.31
4.Companies in chemical industry	82.9298	60.188
5.Companies in steel industry	212.907	77.805
	=====	=====
	596.6695	1023.625

This shows that average profit per year of all companies studied in private sector in Kerala is Rs.13.419 crores and in public sector it is Rs.127.838 crores. Similarly, profit made by companies in other groups are also shown.

Details of profit of each company coming under the various groups are given in Table 6.3.

Table 6.3

<u>A V E R A G E P R O F I T</u>		
	<u>Private sector</u>	<u>Public sector</u>
<u>Companies in Kerala</u>	Rs. Cr.	Rs. Cr.
1	5.514	1.66
2	(1.4048)	68.298
3	0.41	24.55
4	6.5	31.32
5	2.4	4.318
6	-	(2.308)
	=====	=====
Total	13.419	127.838
 <u>Companies in Orissa</u>		
1	2.482	(1.56)
2	1.0217	(0.96)
3	5.525	(1.6275)
4	6.283	2.055
5	7.96	(0.474)
6	(2.048)	197.8
7	13.47	256.5
8	1.46	75.75
	=====	=====
	36.1537	527.484
 <u>Companies in Aluminium Industry :</u>		
1	61.93	157.7
2	189.33	72.61
	=====	=====
	251.26	230.31

Companies in Chemical Industry :

1	0.451	24.55
2	2.4	31.32
3	74.08	4.318
4	0.1238	-
5	2.335	-
6	3.54	-
	=====	=====
	82.9298	60.188

Companies in Steel Industry :

1	6.283	2.055
2	7.96	75.75
3	166.156	-
4	14.378	-
5	18.13	-
	=====	=====
	212.907	77.805

Source: Survey data

6.3.1.3 Profit as a Percentage of Sales

Average profits expressed as a percentage of sales are given in Table 6.4. This shows that private sector companies in Kerala are making a profit of 5.83% of sales compared to 3.98% profit by public sector. In other words profits made by private sector are higher than public sector companies. In all groups of companies private sectors are better than public sector companies.

Table 6.4

A V E R A G E P R O F I T A S % O F S A L E S

<u>Companies in Kerala</u>	<u>Private sector</u> as % of sales	<u>Public sector</u> as % of sales
1	13.247	2.84
2	(1.75)	5.17
3	1.21	8.975
4	4.46	3.85
5	12.0	7.64
6	-	(4.58)
	=====	=====
Average	5.83	3.98

Companies in Orissa

1	1.98	(8.46)
2	1.78	(5.86)
3	9.45	(5.57)
4	5.5	3.9
5	19.52	(4.67)
6	(8.05)	15.44
7	7.11	25.3
8	1.37	1.86
	=====	=====
Average	4.8325	2.74

Companies in Aluminium Industry :

1	6.98	12.31
2	18.73	11.05
	=====	=====
Average	12.86	11.69

Companies in Chemical Industry :

1	1.21	8.975
2	12.0	3.85
3	18.65	7.64
4	2.89	
5	9.57	
6	2.81	
	=====	=====
Average	7.86	6.82

Companies in Steel Industry :

1	5.48	3.90
2	19.52	1.86
3	5.96	
4	5.43	
5	4.29	
	=====	=====
Average	8.14	2.88
Average for all Groups	7.91	5.62
	=====	=====

Source: Survey data

6.3.1.4 The amount of capital expenditure planned and spent per year by all companies in various groups are given below.

<u>Group</u>	<u>Private sector</u>		<u>Public sector</u>	
	Planned	Actual	Planned	Actual
	Rs.Cr.	Rs.Cr	Rs.Cr.	Rs.Cr.
1.Companies in Kerala	9.839	5.608	70.74	43.706
2.Companies in Orissa	21.26	14.01	259.573	113.52
3.Companies in aluminium industry	252.17	180.47	237.73	115.72
4.Companies in chemical industry	16.162	12.234	33.17	19.178
5.Companies in steel industry	752.99	553.304	51.225	25.80
	=====	=====	=====	=====
Total	1052.42	765.63	652.438	317.927

Details are shown in Table 6.5

This shows that private sector companies in Kerala covered by the study had planned Rs.9.839 crores average per year but could spend Rs.5.608 crores only. Similarly the capital expenditure planned and actually executed in one year in various groups of industries are also shown.

Table 6.5

<u>CAPITAL EXPENDITURE PLANNED AND ACHIEVED</u>				
	Private Sector		Public Sector	
	Planned	Achieved	Pland.	Achied.
	Rs.Cr	Rs.Cr	Rs.Cr	Rs.Cr
<u>Companies in Kerala</u>				
1	5.089	2.5	1.66	0.534
2	*	*	32.84	23.79
3	0.45	0.34	12.36	7.3
4	2.8	1.668	18.3	11.76
5	1.5	1.1	2.51	0.118
6	-	-	3.07	0.204
	=====	=====	=====	=====
Total	9.839	5.608	70.74	43.706

* No cap. exp. as the copmany is now under BIFR

Companies in Orissa

1	1.56	0.922	0.21	0.085
2	1.002	0.5833	0.25	0.1125
3	1.5	1.175	0.45	0.185
4	2.1	1.14	1.225	0.503
5	1.55	1.014	0.108	0.043
6	1.65	1.042	158.33	63.04
7	10.22	7.296	49.0	24.25
8	1.68	0.84	50.0	25.3
	=====	=====	=====	=====
Total	21.26	14.01	259.573	113.52

Companies in Aluminium Industry :

1	141.17	99.47	158.73	76.24
2	111.0	81.0	79.0	39.48
	=====	=====	=====	=====
Total	252.17	180.47	237.73	115.72

Companies in Chemical Industry :

1	0.45	0.34	12.36	7.3
2	1.5	1.1	18.3	11.76
3	11.88	9.2	2.51	0.118
4	0.132	0.1	-	
5	1.46	1.0	-	
6	0.74	0.494	-	
	=====	=====	=====	=====
Total	16.162	12.234	33.17	19.178

Companies in Steel Industry :

1	2.1	1.14	1.225	0.503
2	1.55	1.014	50.0	25.3
3	729.0	537.69	-	
4	9.54	6.82	-	
5	10.8	6.64	-	
	=====	=====	=====	=====
Total	752.99	553.304	51.225	25.803

Source Survey data

6.3.1.5 Percentage of capital expenditure actually spent per company in each year against the capital expenditure planned are given below.

<u>Group</u>	<u>Private sector</u>	<u>Public sector</u>
	%	%
1.Companies in Kerala	64.34	39.88
2.Companies in Orissa	62.49	43.42
3.Companies in Aluminium industry	71.72	49.00
4.Companies in Chemical industry	72.89	42.67
5.Companies in Steel industry	65.29	45.83
	=====	=====
Average	67.34	44.16

Details of data collected are shown in Table 6.6

It shows that maximum spending in terms of capital expenditure is occurring in private sector aluminium industries, where as the minimum is in the public sector companies in Kerala. Another important factor seen from the study is that in all groups the capital expenditure actually spent in private sector companies is higher than the capital expenditure incurred in public sector. Taking the average of capital expenditure planned v/s capital expenditure incurred, it is found that in private sector the

achievement is 67.34 % where as in public sector it is only 44.16 %.

Table 6.6

<u>% OF CAPITAL EXPENDITURE ACHIEVEMENT</u>		
<u>Companies in Kerala</u>	Private sector	Public sector
1	49.13	32.17
2	-	72.44
3	75.55	59.06
4	59.57	64.26
5	73.33	4.7
6	-	6.64
	=====	=====
Average	64.34	39.88
<u>Companies in Orissa</u>		
1	59.1	40.48
2	58.21	45.0
3	78.33	41.11
4	54.29	41.06
5	65.42	39.81
6	63.15	39.82
7	71.39	49.49
8	50.0	50.6
	=====	=====
Average	62.49	43.42
<u>Companies in Aluminium Industry :</u>		
1	70.46	48.03
2	72.97	49.975
	=====	=====
Average	71.72	49.00

Companies in Chemical Industry :

1	75.55	59.06
2	73.33	64.26
3	77.44	4.7
4	75.76	-
5	68.49	-
6	66.76	-
	=====	=====
Average	72.89	42.67

Companies in Steel Industry :

1	54.29	41.06
2	65.42	50.6
3	73.76	-
4	71.49	-
5	61.48	-
	=====	=====
Average	65.29	45.83

Source Survey data

6.3.1.6 Capital expenditure planned and actually spent expressed as a percentage of sales are given below

	<u>Private sector</u>		<u>Public sector</u>	
	Cap.exp.	Cap.exp.	Cap.exp.	Cap.exp.
	Planned	Actual	Planned	Actual
	<u>as % of sales</u>		<u>as % of sales</u>	
Companies in Kerala	5.74	3.41	3.77	1.24
Companies in Orissa	3.08	1.99	3.26	1.39

Companies from				
Aluminium industry	13.45	9.61	12.21	5.98
Companies from				
Chemical industry	3.58	2.609	3.74	1.44
Companies from				
Steel industry	7.58	5.38	1.78	0.79
	-----	-----	-----	-----
Average	6.69	4.60	4.95	2.17
	=====	=====	=====	=====

Details of capital expenditure planned against the actual capital expenditure spent as % of sales are given in Table 6.7. This shows that in private sector capital expenditure planning as % of sales is 6.69% where as in public sector it is only 4.95%. Also the actual capital expenditure spent in private sector is 4.60% of sales against 2.17% of sales in public sector.

From points 6.3.1.5 and 6.3.1.6, it is found that the capital expenditure planned is not really incurred in that year. In most of the years, in most of the companies this is the practice. Moreover expenditure of one year may be a carry over of job not done in the planned year. In other words, time overrun and hence cost overrun are the order of the day.

Table 6.7

CAPITAL EXPENDITURE PLANNED VS ACTUAL AS % OF SALES

<u>Companies in Kerala</u>	<u>Private sector</u>		<u>Public sector</u>	
	Cap.Exp. <u>Plnd</u>	Act. —	Cap.Ex. <u>Plnd</u>	Act. —
1	12.22	6.01	2.84	0.92
2	-	-	2.49	1.8
3	1.33	1.003	4.52	2.67
4	1.92	1.14	2.25	1.45
5	7.5	5.5	4.44	0.21
6	-	-	6.09	0.4
	====	====	====	====
Average	5.74	3.41	3.77	1.24
 <u>Companies in Orissa</u>				
1	1.25	0.739	1.14	0.46
2	1.75	1.02	1.53	0.69
3	2.57	2.01	1.54	0.63
4	1.83	0.99	2.33	0.96
5	3.8	2.49	1.07	0.42
6	6.49	4.1	12.36	4.92
7	5.39	3.85	4.84	2.39
8	1.58	0.79	1.23	0.62
	=====	=====	=====	=====
Average	3.08	1.99	3.26	1.39

Companies in Aluminium Industry :

1	15.91	11.21	12.39	5.95
2	10.98	8.01	12.03	6.0
	====	=====	=====	=====
Average	13.45	9.61	12.21	5.98

Companies in Chemical Industry :

1	1.33	1.003	4.52	2.67
2	7.5	5.5	2.25	1.45
3	2.99	2.32	4.44	0.21
4	3.09	2.34		
5	5.99	4.10		
6	0.586	0.391		
	===	=====	=====	=====
Average	3.58	2.609	3.74	1.44

Companies in Steel Industry :

1	1.83	0.99	2.33	0.96
2	3.8	2.49	1.23	0.62
3	26.12	19.26		
4	3.6	2.58		
5	2.56	1.57		
	=====	=====	=====	=====
Average	7.58	5.38	1.78	0.79

Source Survey data

6.3.2 ANALYSIS OF PARAMETERS RELATED TO FORMULATION OF CAPITAL EXPENDITURES

The various parameters of project formulation are analysed as given below.

6.3.2.1 Time taken for planning for routine capital expenditure projects by various groups of companies covered by the study are given in Table 6.8. It is found that public sector companies are taking more time for planning for routine projects. The average time taken is 1.892 years, whereas in private sector the time taken for planning is only 1.509 years, average. This shows that private sector companies are fast in planning and decision making. In every financial year, private sector companies will plan for next year and will get it approved from the corporate office for easy and fast implementation in the next year. But public sector companies will think twice before taking a decision and also getting the proposal approved from the corporate office is often delayed.

Table 6.8

PLANNING FOR ROUTINE CAPITAL EXPENDITURE PROJECTS		
	<u>Private sector</u> years	<u>Public sector</u> years
Companies in Kerala	1.25	2.83

Companies in Orissa	1.375	1.375
Companies in Aluminium Industry	2	2
Companies in Chemical Industry	1.42	1.5
Companies in Steel Industry	1.5	1.75
	====	=====
Average	1.509	1.892

Source Survey data

6.3.2.2 In comparison to this, the year of planning for expansion projects is reasonably the same for both private sector and public sector companies. Strategic planning is done well ahead of time. Thinking for expansion of projects is found out to be starting well ahead of 5 years both in private sector and public sector companies. Details are given in Table 6.9.

Table 6.9

PLANNING FOR NON-ROUTINE CAPITAL EXPENDITURE PROJECTS (EXPANSION PROJECTS)		
	Private sector	Public sector
	years	years
Companies in Kerala	5.25	5
Companies in Orissa	4.75	5.75
Companies in Aluminium Industry	5.5	5
Companies in Chemical Industry	4.75	5
Companies in Steel Industry	5.25	5.75
	====	=====
Average	5.1	5.3

Source Survey data

6.3.2.3 Frequency of review of projects is found out to be monthly both in public sector and private sector. The review has no meaning unless what is to be reviewed is known clearly. The review meeting should have a known purpose, an agenda, a specified time limit and a place for meeting. In private sector, everybody confirms that meetings are punctual, attendance is generally good, of the order of 85 to 90%, discussions are meaningful, time management is better, minutes of meetings are properly recorded and reviewed, and participation of all members are good. Generally the minutes of meeting is routed through all concerned in the organisation. Review meetings in private sector companies are generally ending up with time bound, man bound action plans which will be reviewed in the next meeting.

In public sector companies, meetings are there for meeting sake. Time bound, man bound action plan is very less. Even if it is made, adherence to action plan is comparatively less. Review meeting is to be made use of as a tool for corrective action. Any planning will have problems and only problems. The review meeting will give opportunity for corrective action so that what ever variation has happened can be corrected and modified and preventive action can be taken to avoid these type of variations in future. If a meeting is to be meaningful, the members should come prepared. In private sector the preparations usually made by the members before the meeting are praiseworthy. Greater the homework, better is the result.

6.3.2.4 Evaluation methods used in capital expenditure decision play a vital role in accepting or rejecting a proposal for a project. The usual method everybody uses is Pay Back Method. It is easy to use and simple to calculate. But it does not take care of the time value of money. Discounted cash flow method of evaluation of a capital expenditure is more of a theoretically sound method. Both in private sector and public sector the usual method used is pay back method. Discounted cash flow method and or Net Present Value method are also used especially for expansion projects.

The evaluation methods used by different companies are shown in Table 6.10. It shows that payback method is common in all companies. Discounted cashflow method was found used in 16 private sector (61.54%) and 12 public sector companies (75%) Net present value method are found used in 4 private sector (15.4%) and 7 public sector (43.75%) companies. No company is found using accountant rate of return or MAPI method for evaluating capital expenditure. In high profit making companies, it is found that all companies are using pay back method. Added to that, 6 companies(85.72%) in private sector are found using DCF techniques and 3 companies (42.86%) are using NPV method. Similarly in public sector, all companies are using payback method, 5 companies (71.43%) are using DCF method, 2 companies (28.57%) are using NPV method and one company (14.28%) is using ARR method.

Table 6.10

USE OF EVALUATION METHODS

<u>Companies in Kerala</u>	<u>Private sector</u>	<u>Public sector</u>
1	Payback	Payback
2	Payback	Payback+DCF
3	Payback	Payback+DCF
4	Payback+DCF	Payback+DCF+NPV
5	Payback+DCF	Payback
6		Payback+DCF+NPV
-----		-----
	5 Payback+ 2 DCF	6 Payback+4 DCF+ 2 NPV
 <u>Companies in Orissa</u>		
1	Payback+DCF	Payback
2	Payback+DCF	Payback
3	Payback+DCF	Payback
4	Payback+DCF+NPV	Payback
5	Payback+DCF	Payback
6	Payback	Payback+DCF+NPV
7	Payback+DCF	Payback+DCF+NPV
8	Payback	Payback+DCF+NPV
-----		-----
	8 Payback+ 6 DCF+ 1NPV	8 Payback+3 DCF+ 2 NPV
 <u>Companies in Aluminium Industry</u>		
1	Payback+DCF	Payback+DCF+NPV
2	Payback+DCF	Payback+DCF
-----		-----
	2 Payback+ 2 DCF	2 Payback+2 DCF+ 1 NPV

Companies in Chemical Industry

1	Payback	Payback+DCF
2	Payback+DCF	Payback+DCF+NPV
3	Payback+DCF+NPV	Payback
4	Payback+DCF	
5	Payback	
6	Payback	

 6 Payback+ 3 DCF+ 1NPV 3 Payback+2 DCF+ 1 NPV

Companies in Steel Industry

1	Payback+DCF+NPV	Payback
2	Payback	Payback+DCF+NPV
3	Payback+DCF+NPV	
4	Payback	
5	Payback+DCF	

 5 Payback+ 3 DCF+ 2NPV 2 Payback+1 DCF+ 1 NPV

Total 26 Payback+ 16DCF+ 4NPV 21 Payback+ 12 DCF+ 7 NPV

[There are 4 companies (15.38 %) in private sector using 3 evaluation methods, 12 companies (46.15 %) using 2 evaluation methods and 10 companies (38.46 %) using one evaluation method. In public sector, there are 8 companies (38.1 %) using 3 methods 4 companies (19.1%) using 2 methods and 9 companies (42.86 %) using single method]

	High Profit Making Companies	Low Profit Making Companies
	-----	-----
1	Payback+DCF+NPV	Payback+DCF+NPV
2	Payback+DCF	Payback+DCF
3	Payback+DCF+NPV	Payback+DCF
4	Payback+DCF+NPV	Payback+DCF+ARR
5	Payback+DCF+NPV	Payback+DCF+NPV
6	Payback	Payback
7	Payback+NPV	Payback
	-----	-----
	7 Payback+ 6 DCF+ 5NPV	7 Payback+5 DCF+ 2 NPV + 1 ARR

Source: Survey data

Evaluation methods may be good, but the estimate of benefits and other parameters, if not realistic, may lead to inaccurate results. Estimates depend upon collection of data. Time and energy used for collecting data by private sector is found better than public sector companies.

During the evaluation of alternate projects for capital expenditure, the important parameters usually covered are cost estimate, benefits expected, life span of the project, salvage value of items involved in the project, time for completion of the project, change in the system prevailing in the company, type of job done by the existing operators, type of material handling, maintenance practices, scrap generated, pollution problems etc, When it comes to reality i.e., after the execution of the

capital expenditure project or during the starting of the new facility or equipment, the expectations do not generally tally with the actuals. The ratio of actuals to the estimates given in the capital expenditure evaluation report is termed as the efficiency of the evaluation method. These data were collected during the discussion with the senior executives of various companies. The data is based on their experience and or judgement. Data are tabulated and grouped as companies in Kerala, Orissa, Aluminium Industries, Chemical Industries, and Steel Industries and are shown below in Table 6.11.

Efficiency of project evaluation depends upon the methods selected, estimates made, data collected etc., The average efficiency of project evaluation is found out to be 87.8% in private sector compared to 78.58% in public sector. The following are the details:-

Table 6.11

EFFICIENCY OF PROJECT EVALUATION		
<u>Group</u>	<u>Private sector</u>	<u>Public sector</u>
	%	%
1. Companies in Kerala	87.5	82.5
2. Companies in Orissa	86.25	76.88

3.Companies in aluminium industry	90.0	77.5
4.Companies in chemical industry	88.75	80.5
5.Companies in steel industry	86.5	75.5
	=====	=====
Average	87.8	78.58

Source Survey data

Even though there is a clear difference between private sector and public sector, there is not much difference between different types of industries as far as efficiency of project evaluation is considered.

6.3.2.5 When a financial report is made, various data are collected, assumptions are made, costs are estimated and benefits are projected. How far these details are effective in the capital expenditure project is a meaningful question. Collection of required data and analysis at the appropriate time can be called as an art. The relationship with the outcome in relation to the input projected in the financial report and actually achieved is the effectiveness of financial report. It is found that the average effectiveness of financial report is 88.0% in private sector compared to 80.33% in public sector. The details of analysis are given below in table 6.12.

Table 6.12

EFFECTIVENESS OF DETAILED FINANCIAL REPORT		
<u>Group</u>	<u>Private sector</u>	<u>Public sector</u>
	%	%
1.Companies in Kerala	88.75	80.83
2.Companies in Orissa	88.75	79.34
3.Companies in aluminium industry	90.0	80.0
4.Companies in chemical industry	85.0	81.5
5.Companies in steel industry	87.5	80.0
	=====	=====
Average	88.0	80.33

Source Survey data

This shows that variation in effectiveness of detailed financial report is 8% between private sector and public sector companies. Between the different group of industries, the variation is 5% in private sector and 2% in public sector.

6.3.3 ANALYSIS OF PARAMETERS RELATED TO IMPLEMENTATION OF CAPITAL EXPENDITURE PROJECTS

The various parameters related to capital expenditure implementation are analysed as follows.

6.3.3.1 The delay in implementation of capital expenditure jobs during the period of study is collected by discussions with the senior executives of various organisations. The increase in cost for capital expenditure is also calculated from the books of account of the companies coming under the study. Percentage delay in implementation and increase in cost in various groups of companies are given below.

	<u>Private sector</u>		<u>Public sector</u>	
	Delay in implementation	Increase in cost	Delay in implem.	Increase in cost
	%	%	%	%
Companies in Kerala	27.17	21.46	31.28	28.18
Companies in Orissa	23.65	23.37	32.49	33.14
Companies from Aluminium industry	16.25	14.165	30.84	32.5
Companies from Chemical industry	24.33	23.18	30.9	28.67
Companies from Steel industry	23.8	25.12	37.3	36.7
	-----	----	----	-----
Average	23.04	21.46	32.56	31.84

The above details show that the average delay in implementation of capital expenditure in private sector is 23.04% average in a company. In other words, a capital expenditure project planned for one year is getting completed only after one year and 3 months. In public sector the delay in implementation is 32.56%, i.e., a job planned for one year will be implemented only after one year and 4 months. This delay will definitely lead to delay in getting the benefits from the projects and also will result in interest burden for the money borrowed. Moreover the inflation will also push up the cost of the project.

Table 6.13 shows the details of the delay in implementation of capital expenditure and increase in cost separately for public sector and private sector companies.

Table 6.13

DELAY IN IMPLEMENTATION OF CAPITAL EXPENDITURE ALONG WITH INCREASE IN COST (AS %)				
	<u>Private sector</u>		<u>Public sector</u>	
	Delay in implement	Increase in cost	De.in imple.	Increa. in cost
<u>Companies in Kerala</u>				
1	36.0	21.8	35.0	35.0
2	-	-	24.0	17.1
3	31.67	23.33	30.0	24.0
4	26.0	25.7	33.3	35.0

5	15.0	15.0	29.4	27.0
6	-	-	36.0	31.0
	=====	=====	=====	=====
Average	27.17	21.46	31.28	28.18
<u>Companies in Orissa</u>				
1	25.0	26.0	37.0	38.0
2	22.5	20.0	37.5	36.25
3	20.0	22.5	36.25	33.75
4	25.0	23.75	30.0	31.25
5	23.0	24.0	30.0	30.0
6	28.0	27.0	31.67	33.33
7	24.0	22.0	27.5	30.0
8	21.67	21.67	30.0	32.5
	=====	=====	=====	=====
Average	23.65	23.37	32.49	33.14
<u>Companies in Aluminium Industry :</u>				
1	22.5	20.0	31.67	33.33
2	10.0	8.33	30.0	31.67
	=====	=====	=====	=====
Average	16.25	14.165	30.84	32.5
<u>Companies in Chemical Industry :</u>				
1	31.67	21.8	30.0	24.0
2	15.0	15.0	33.3	35.0
3	23.5	24.2	29.4	27.0
4	21.8	24.8	-	-
5	26.5	25.2	-	-
6	27.5	28.1	-	-
	=====	=====	=====	=====
Average	24.33	23.18	30.9	28.67

Companies in Steel Industry :

1	26.0	25.2	38.2	37.1
2	21.9	24.8	36.4	36.3
3	20.8	23.2	-	-
4	24.2	24.1	-	-
5	26.1	28.3	-	-
	=====	=====	=====	=====
Average	23.8	25.12	37.3	36.7

Source Survey data

The major reasons for delay in the implementation of capital expenditure as pointed out by the various companies are

- (1) Delay in getting materials / equipments on time
- (2) Delay in getting jobs done on time

From the analysis of data collected it is found that the average delay in getting materials/equipments on time is 19.93% in private sector compared to 21.88% in public sector. Similarly, the delay in getting jobs done is 22.39% in private sector compared 23.13% in public sector. Details are shown in Table 6.14

Table 6.14

DELAY IN GETTING MATERIALS/EQUIPMENT AND DELAY IN GETTING JOB DONE				
	<u>Private sector</u>		<u>Public sector</u>	
	Av.delay in getting mat. or equipment %	Av.delay in getting job done %	Av.delay in getting mat./equip. %	Av. delay in getting job done %
Companies in Kerala	17.5	18.75	19.17	22.5
Companies in Orissa	23.13	26.88	24.38	25.0
Companies in Aluminium Industry	22.5	27.5	25.0	25.0
Companies in Chemical Industry	15.5	16.83	18.33	15.67
Companies in Steel Industry	21.0	22.0	22.5	27.5
	=====	=====	=====	=====
Average	19.93	22.39	21.88	23.13

Source Survey data

Most of the companies, when issuing a purchase order for procurement of materials, are now including a liquidity damage (L.D) clause. This clause in purchase order will clearly indicate that the price will be reduced by a particular percent for a particular period

subject to a maximum. For example, 1/2% of the purchase order value per week for a maximum period of 10 weeks i.e., 5% of the purchase order value can be deducted from the invoice for the supply of material or equipment, if the delay is 10 weeks or more over the committed delivery time. The term liquidity damage means the damages caused to the operation of the company resulting in increase in cost or reduction in sales due to the delay in getting the material ordered with a supplier.

This will help to recoup the measureable damages caused to the buyer due to the delay in getting the materials on time. But the damages which are not measureable are very difficult to quantify and generally will go unnoticed. The various items purchased for a project are generally having a "series" linkage. For example, for the construction of a plant the building should be ready first, then the crane girder and crane rail are to be installed. After that electric overhead travelling crane should come and it is to be installed. Once the crane is ready, the equipment, say, a ball mill, or a hydraulic press, or a compressor can be installed on the foundation. Before commissioning the equipment say the ball mill, its motor, cables and control panel should reach the site. If every thing is ready on time, the project will be completed on time. Delay in getting one equipment or one component, may be minor or major, will delay the project.

A model PERT is shown in exhibit 6.2A⁽¹⁾ showing the linkages of various activities. A change in the time taken for one activity will change the time of total project.

The modified PERT is shown in exhibit 6.2B. If there is a slackness in one activity and that activity is delayed within the slackness, total project will not get affected. If there is no slackness in the activity and the activity is delayed total project duration will get extended. In exhibit 6.2B it is shown that total project duration has increased from 22 weeks to 24 weeks as the activity K - receipt of ballmill is delayed by 2 weeks from 20 weeks to 22 weeks.

Delay in getting job done is the biggest headache of all project leaders. The average delay in getting job done is found out to be 22.39% in private sector i.e., for example if the time required for the installation of an equipment is 20 days, from the study it is found that generally it is getting extended to 24/25 days.

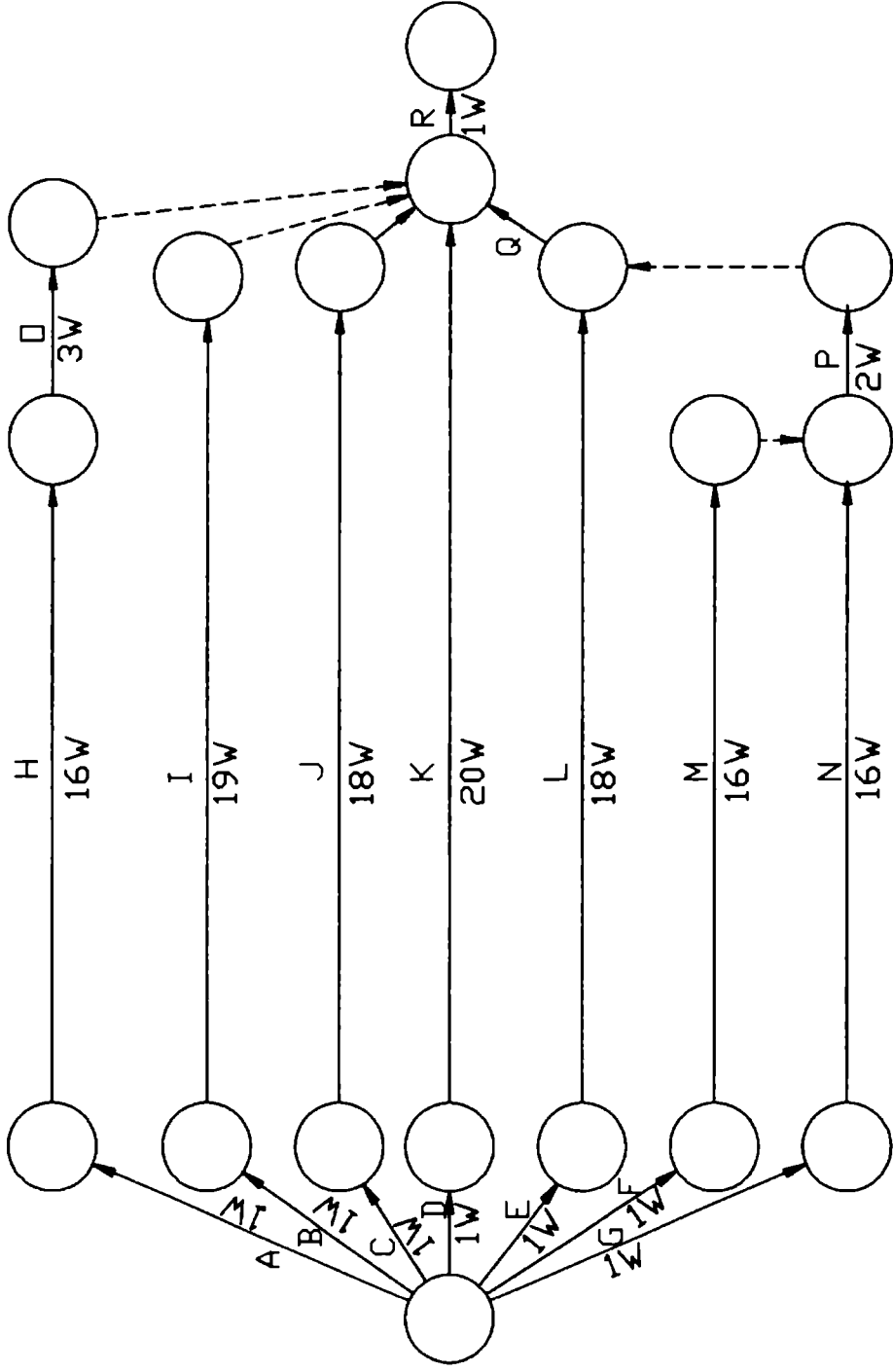
Almost all managers interviewed were saying in one voice that installation or erection of an equipment or plant is the toughest job of the project. The main reason is that the installation crew or erection crew used to move through out the country and hence they know all

(1) Normam R Augustine; Managing projects and Programmes; op cit. pp. 259 - 268

EXHIBIT- 6.2(A)

MODEL PERT

(FOR INSTALLATION OF BALL MILL)

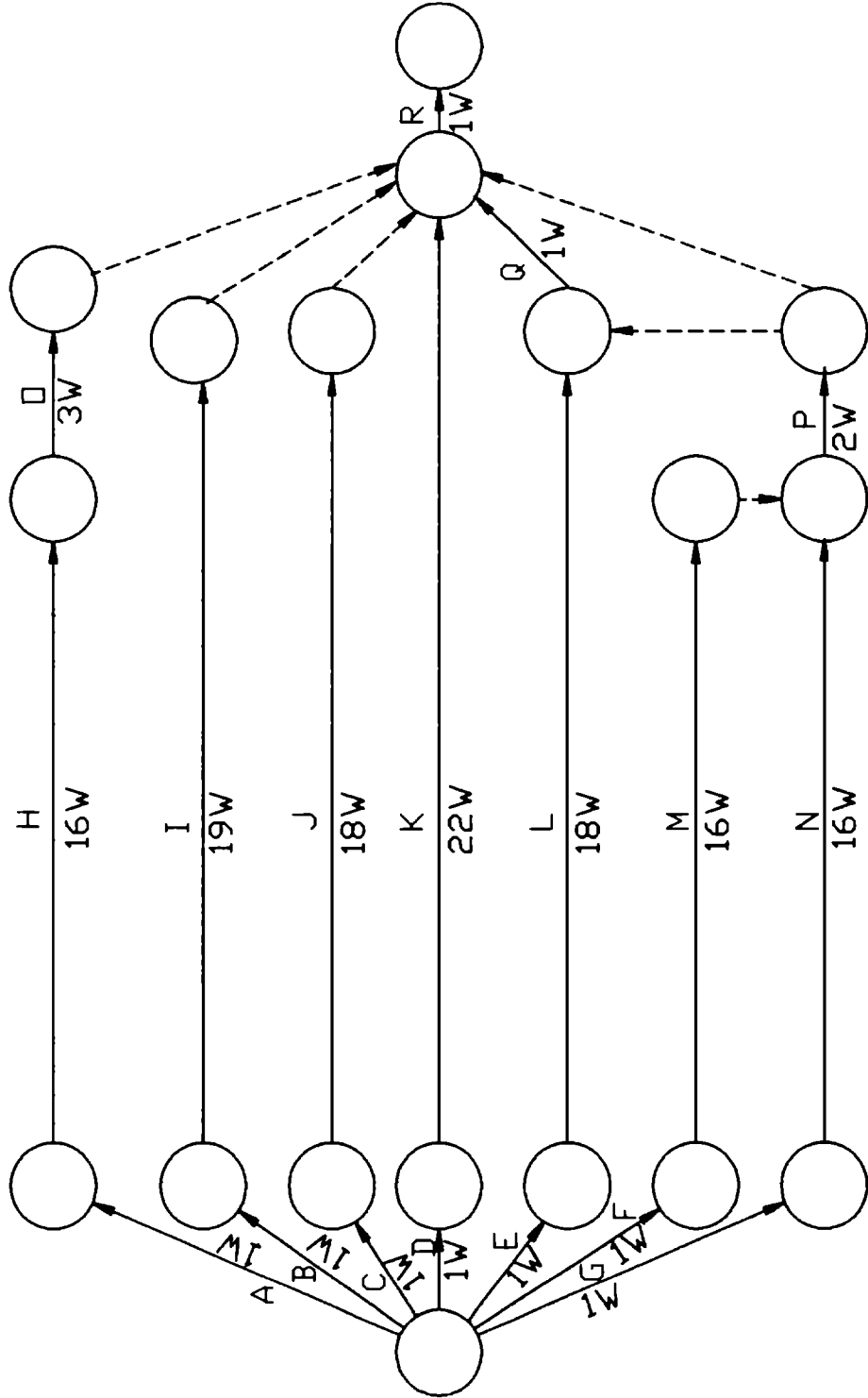


- A- ORDERING OF CABLE
- B- ORDERING MOTOR
- C- ORDERING CONTROL PANEL
- D- ORDERING BALL MILL
- E- ORDERING CRANE
- F- ORDERING BUILDING
- G- ORDERING CRANE GIRDER & RAILS
- H- RECEIPT OF CABLE
- I- RECEIPT OF CABLE
- J- RECEIPT OF CONTROL PANEL
- K- RECEIPT OF BALL MILL
- L- RECEIPT OF CRANE
- M- CONSTRUCTION OF BLDG.
- N- RECEIPT OF CRANE GIRDER & RAILS
- O- CABLE LAYING
- P- INSTALLATION OF CRANE GIRDER & RAILS
- Q- CRANE INSTALLATION
- R- COMMISSIONING OF BALL MILL

PROJECT DURATION = 22 WEEKS

W = WEEK

EXHIBIT - 6.2(B)
 MODIFIED PERT
 (FOR INSTALLATION OF BALL MILL)



- A- ORDERING OF CABLE
- B- ORDERING MOTOR
- C- ORDERING CONTROL PANEL
- D- ORDERING BALL MILL
- E- ORDERING CRANE
- F- ORDERING BUILDING
- G- ORDERING CRANE GIRDER & RAILS
- H- RECEIPT OF CABLE
- I- RECEIPT OF CABLE
- J- RECEIPT OF CONTROL PANEL
- K- RECEIPT OF BALL MILL
- L- RECEIPT OF CRANE
- M- CONSTRUCTION OF BLDG.
- N- RECEIPT OF CRANE GIRDER & RAILS
- O- CABLE LAYING
- P- INSTALLATION OF CRANE GIRDER & RAILS
- Q- CRANE INSTALLATION
- R- COMMISSIONING OF BALL MILL

W = WEEK

PROJECT DURATION = 24 WEEKS

the bad tricks of the trade. Few of the senior managers had expressed their view during interview that they are even prepared to do installation of small equipment coming under capital expenditure, with their permanent workers even at the cost of over time, so as to get the quality of the job and also the timely completion. The installation crew of the supplier generally will come without proper tools and tackles. They will not have any personal protective equipment like helmet, safety shoes, goggles etc. Their ambition will be "some how" finish the job and leave the place so as to help them enjoy a few days in their home under the pretext of installation at some place. The latest problem few managers are pointing out is the "sons of soil approach". If few skilled people are coming for the installation of an equipment, the local people demand to get a few jobs with them or will demand an exorbitant amount. This forces most of the suppliers of equipment to avoid taking the contract for installation.

6.3.3.2 Cost overruns of capital expenditure projects are the order of the day. Whether it is private sector or public sector, time overrun is the major reason for cost overrun. The way in which order is issued to the supplier will also have a bearing on the cost. Companies are generally following 3 different types of contract They are

1. Lumpsum contract
2. Cost plus contract
3. Guaranteed maximum price contract

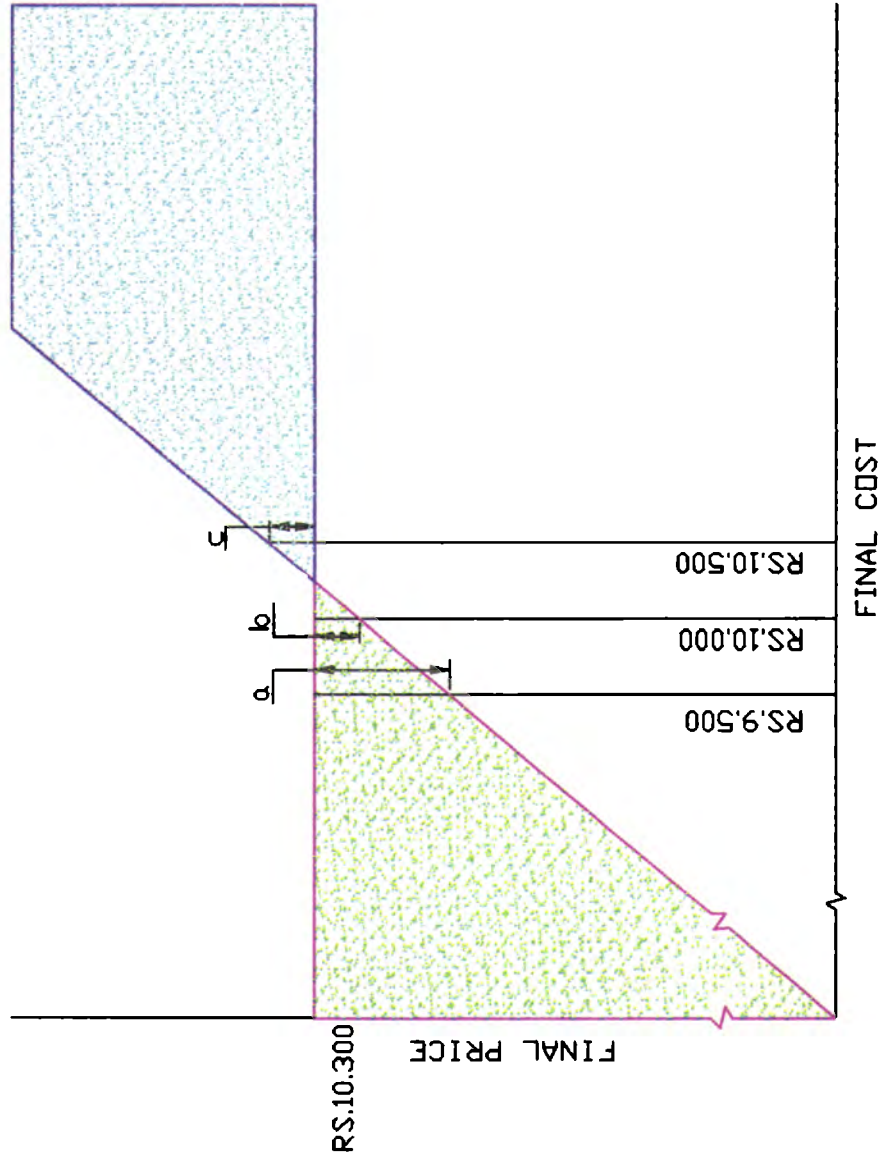
The different types are shown in exhibit 6.3 (A,B,&C) (2) Lumpsum contract is given almost entirely by means of an open bid based on documents blue prints, specifications etc. which keep clearly defined scope of working. This is also used for off the shelf type items. Depending on the reputation, ability and trust of the contractors, companies are using this method. In the costplus method, the supplier gets either the price which is kept as maximum or a price equal to the cost plus a fixed amount as profit. In this case, if the cost is less than the profit, the supplier will get more and at the same time the price the buyer will be paying will also come down. In the lumpsum method, the contractor or supplier takes all the savings along with the risk. In the cost plus method, the buyer gets the savings and takes the risk, whereas in guaranteed maximum price method, the buyer gets the savings and the supplier takes the risk. Most of the managers interviewed are of the opinion that lumpsum method is used for "off the shelf" type of items and cost plus method is used for construction activities. From the exhibits, it is very clear that for the same cost, the price the supplier has to pay is different depending upon the method used.

From the study it is found that average increase in cost is 21.46 % in private sector compared to 31.84 % in public sector. The cost increase in public sector is about 10% over and above the increase in cost in private sector.

(2) Project Management

Harvard Business Review 1991. p.54

EXHIBIT 6.3A
LUMP-SUM CONTRACT
 PRICE IS FIXED AT RS.10.300

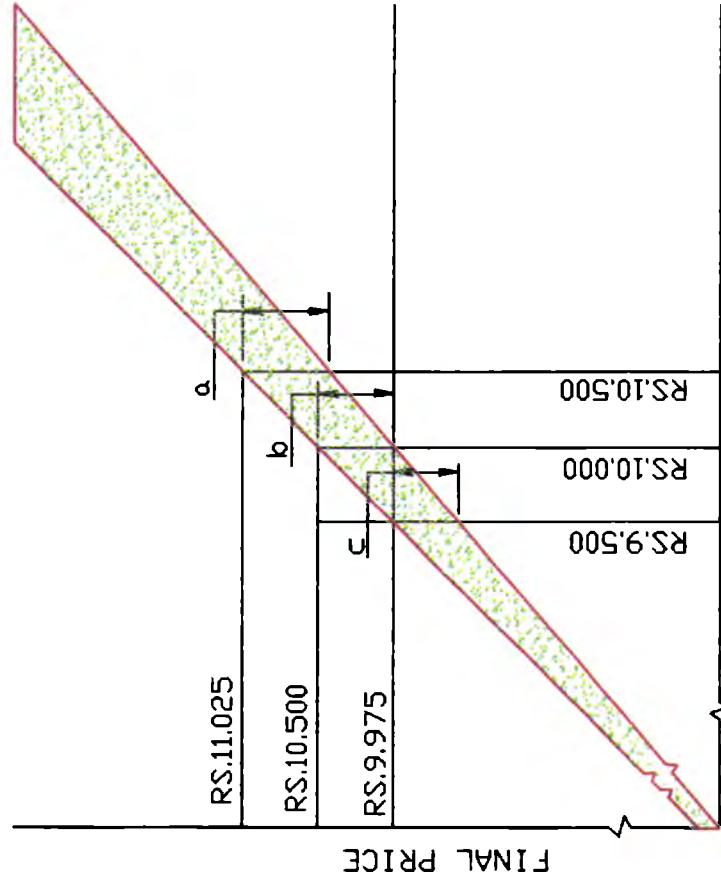


- a=IF FINAL COST IS RS.9.500, CONTRACTOR PROFIT IS RS.800(8.42%)
- b=IF FINAL COST IS RS.10.500(AS EXPECTED) CONTRACTOR PROFIT IS RS.300(3%)
- c=IF FINAL COST IS RS.10.500, CONTRACTOR LOSS IS RS.200(-1.9%)

EXHIBIT 6.3B

COST PLUS CONTRACT

PRICE=COST PLUS 5%



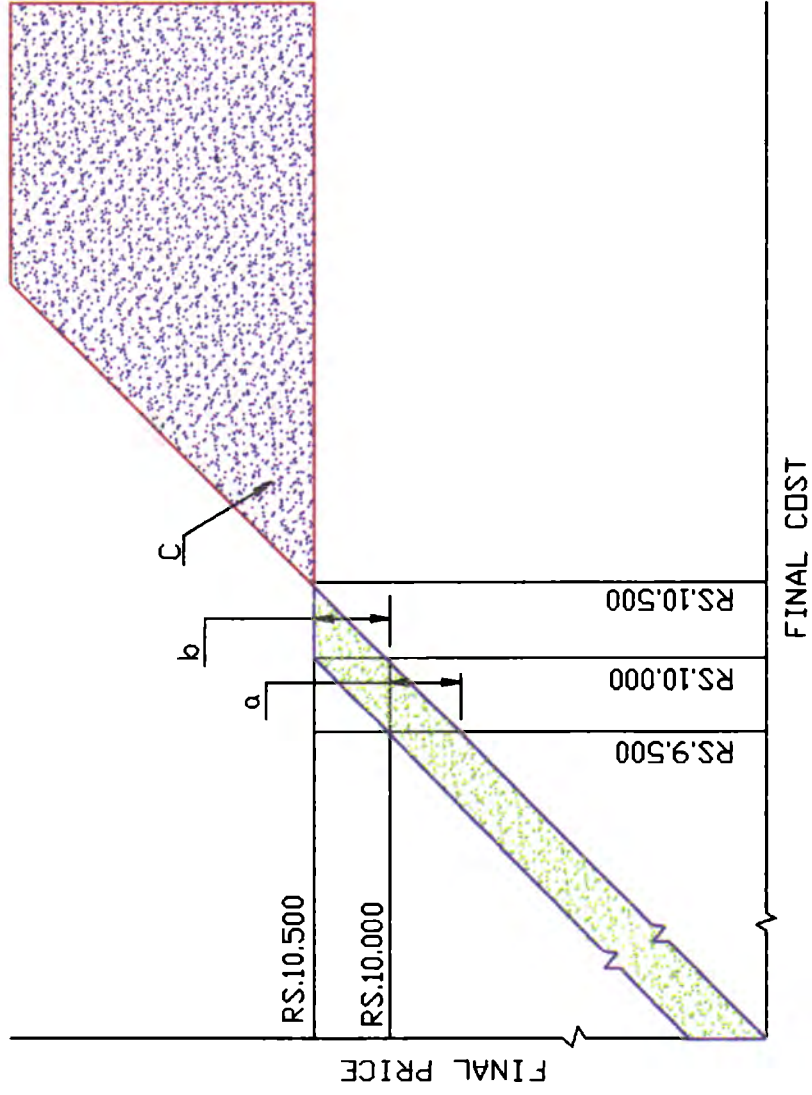
FINAL COST

- a=IF FINAL COST IS RS.9.500, CONTRACTOR PROFIT IS RS.475(5%)
- b=IF FINAL COST IS RS.10.000 CONTRACTOR PROFIT IS RS.500(5%)
- c=IF FINAL COST IS RS.10.500, CONTRACTOR PROFIT IS RS.525(5%)

EXHIBIT 6.3C

GUARANTEED-MAXIMUM-PRICE CONTRACT

<PRICE=CDST OF WORK PLUS FIXED FEE OF RS.500 WITH A MAXIMUM PRICE OF RS.10.500>



a=IF FINAL CDST IS RS.9.500,CONTRACTOR PROFIT IS RS.500(5.26%)

b=IF FINAL CDST IS RS.10.000 CONTRACTOR PROFIT IS RS.500(5%)

c=IF FINAL CDST IS RS.10.500,CONTRACTOR PROFIT IS RS.0(0%)

6.3.3.3 Return on expected gain is the real measure of any capital expenditure project. During the time of preparation of capital expenditure proposal, the earnings expected, the economic life, the capital tied up etc., are estimated. Then a cost benefit analysis is made. Most of the managers interviewed were of the opinion that the project proposal may not contain the details necessary for calculating the cost and benefit. For example, the proposal may contain the statement like "no alternative is possible"⁽³⁾, (There are always alternatives to an investment proposal and a systematic analysis of the alternatives is the bench mark for estimating both the investment and the benefits of a capital project) or a "must investment" (The reason for making an investment should not be that it is urgent or indispensable, but that it is profitable) or a "routine replacement" (This fallacy maintains that scheduled periodic replacement of a capital facility is a practical and inexpensive substitute for an investment analysis of the economic desirability of individual replacement), or "prediction is impossible" (Forecasting, though difficult and subject to error is nevertheless necessary in appraising the worth of capital projects) etc., In these cases, analysing the return on expected gain is pretty difficult. Data collected shows that 82.5% of the expected gain is achieved in private sector, whereas in public sector it is only 80%.

(3) Capital Investment - Part I;
Harvard Business Review 1979. p.26

6.3.3.4 Project planning and scheduling, if properly managed, the success of the project is assured. Planning is a tool for fixing the actions to come in future. Planning ahead means what will happen tomorrow is to be known today, what will happen next week is to be known this week, what will happen next month is to be known this month itself. Planning needs data. Past data is generally considered as the best tool for planning. Scheduling is the allocation of available resources as per the required needs. Generally needs will be plenty but there are limitations for resources. Therefore, scheduling is to be very effective. Whatever scheduled should come at the proper time. Questions were asked to the executives to get the percentage of success of project planning and scheduling in their organisations. Their answers based on their experience were collected. Average effectiveness of project planning and scheduling which came out from the collected data is 84.53% in private sector compared to 68.53% in public sector. The details of data collected are as follows:-

Table 6.15

EFFECTIVENESS OF PROJECT PLANNING AND SCHEDULING		
<u>Group</u>	<u>Private sector</u>	<u>Public sector</u>
	%	%
1.Companies in Kerala	86.25	79.17
2.Companies in Orissa	74.38	55.08

3.Companies in		
aluminium industry	90.0	70.0
4.Companies in		
chemical industry	87.45	74.0
5.Companies in		
steel industry	84.6	64.5
	=====	=====
Avarage	84.54	68.55

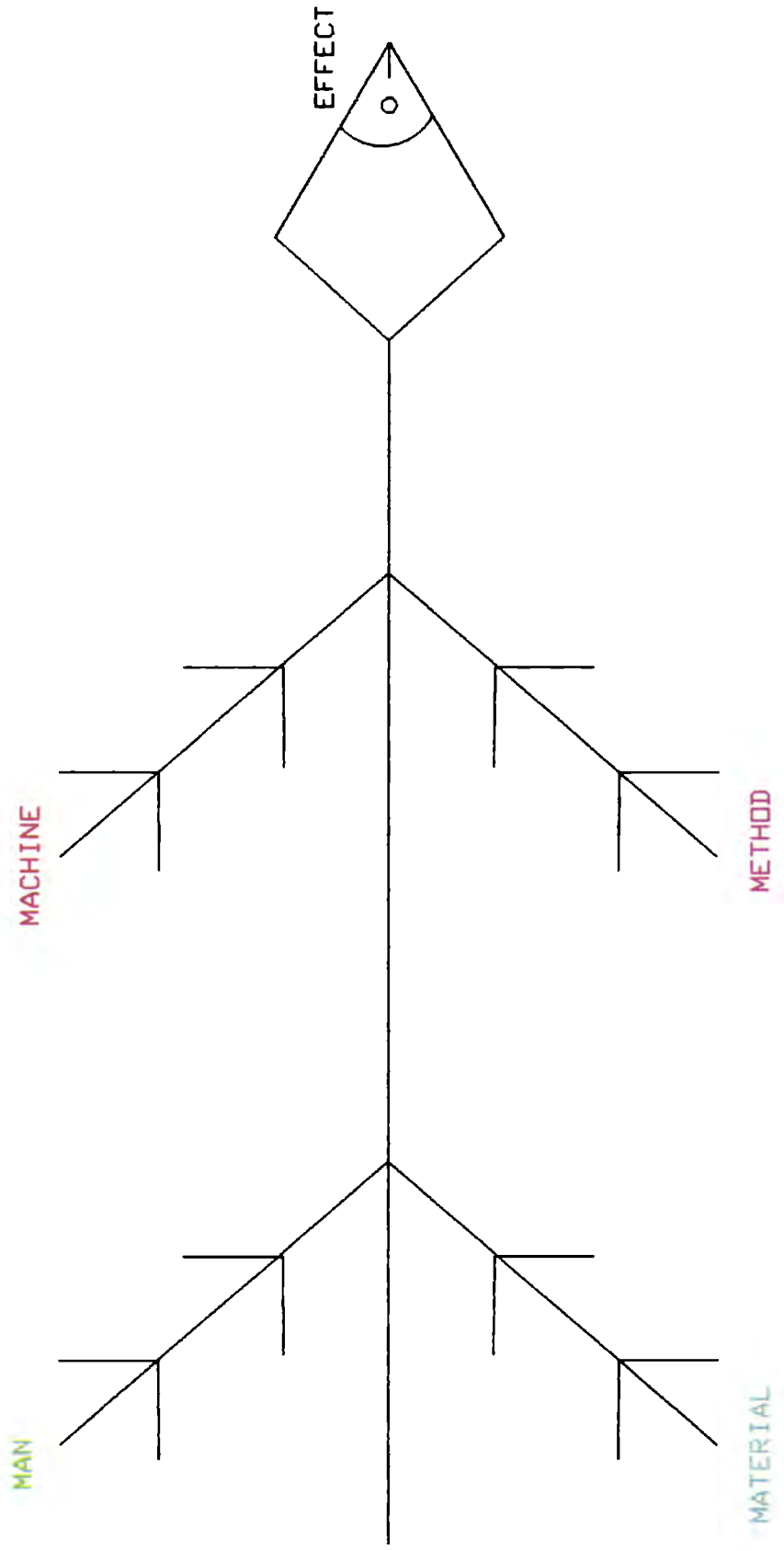
Source Survey data

As far as effectiveness of project planning and scheduling is concerned, there is a significant difference of 16% between private sector and public sector. Among the different group of industries, effectiveness of project planning and scheduling is found to be very high in private sector Aluminium companies. The variation among private sector companies is 16%, whereas the variation is 24% in public sector companies. In both the cases, the low effectiveness is found in the companies in Orissa.

6.3.3.5 Project monitoring is done to find out how far the objectives are achieved. The objectives are converted into action plan with milestones for measuring. Any deviation from the plan is to be analysed and corrective action taken. To find out the root cause of a deviation from the plan, a cause and effect diagram (also called as Fish Bone Diagram) is used. Exhibit 6.4 shows the cause and effect diagram. The four major causes are Man, Machine, Material, and Method. These can be subdivided further like

EXHIBIT - 6.4

CAUSE AND EFFECT DIAGRAM



fish bones. After a brainstorming session, a number of causes can be found out which have resulted in a particular effect. The causes may be a chance cause/random cause or an assignable cause. Analysing the possible causes further will lead to the root cause. For removing a problem, the root cause has to be found out first and then remedial or corrective actions are to be taken. Once the cause is known the remedial action is easy to find out. Data are collected from the senior executives of the various organisations and recorded as per schedule. Effectiveness of project monitoring is found out to be 85.28% in private sector compared to 74.36% in public sector. The data collected from different group of companies are given below:-

Table 6.16

EFFECTIVENESS OF PROJECT MONITORING

<u>Group</u>	<u>Private sector</u>	<u>Public sector</u>
	%	%
1.Companies in Kerala	85.0	77.5
2.Companies in Orissa	81.88	70.63
3.Companies in aluminium industry	90.0	75.0
4.Companies in chemical industry	84.0	77.2

5.Companies in		
steel industry	85.5	71.5
	=====	=====
Avarage	85.28	74.37

Source Survey data

It shows that effectiveness of project monitoring varies by 11% between private sector and public sector companies. The variation between different group of companies is around 6% both in public sector and private sector.

6.3.3.6 Negotiations of contract is an art rather than a science. The need for improving negotiating skills for executives who are responsible for buying, selling, dealing with trade unions etc., is on the increase now. Before negotiating the price for a project, the competitor's price, quality and availability etc., should be known early. Analysis of various elements of cost will help in negotiating. The cost has to be reduced into small, small fragments and studied. In private sector, the negotiation is done in a more systematic way. Now a days, training programmes are available in all premier management institutions for improving negotiating skills of senior managers. For project negotiations all concerned department heads like Engineering, Purchase, Finance etc., are generally present. Collection of data will definetly help in negotiating.

It is often said that "Negotiations are the heart of the selling or buying process" It is generally believed that only one side - either the buyer or the seller will come out victorious. This notion is wrong. If everybody is keen, negotiations can be win - win experience for the buyer as well as the seller. There are four characteristics of a good negotiation⁽⁴⁾ The first is that each party should feel that other party is caring about his or her interests. The second is that each party should feel that the other party has won as well. The third is that the self respect of each party is intact. The last is about trust; each party should feel that the other will abide by the agreement.

To make a negotiation obey these characteristics, the following thumb rules may be observed:-

- * Negotiations can be at the end of sales process.
- * Consider the consequences of all the concessions.
- * Offer solutions, but never at a discounted price.
By discounting the price in advance, the sales person reduces the price flexibility.
- * Offer a concession, but get one in return. Negotiation is not capitulation. It is a discussion between two parties seeking to reach an agreement. Every inch that the seller yields, must be compensated by corresponding action on the buyer's part.
- * Be patient.

(4) The Strategist

Business Standard 27 August 1996. p.6

Effectiveness of negotiation is the accuracy level at which the negotiated price is the reality. In private sector the effectiveness of negotiation is found as 86.93% whereas in public sector it is only 71.18%. This shows that there is a considerable gap between public sector and private sector companies as far as effectiveness of negotiation is concerned. The details collected are given below:-

Table 6.17

EFFECTIVENESS OF NEGOTIATION		
<u>Group</u>	<u>Private sector</u>	<u>Public sector</u>
	%	%
1.Companies in Kerala	87.5	66.67
2.Companies in Orissa	86.88	73.75
3.Companies in aluminium industry	87.5	75.0
4.Companies in chemical industry	88.5	67.0
5.Companies in steel industry	84.25	73.5
	=====	=====
Avarage	86.93	71.18

Source Survey data

Variation in effectivenesses of negotiations between private sector and public sector is approximately 16%. In private sector, the variation between different groups of companies is negligible. But in public sector, the effectiveness differs in different groups of companies by 8%.

6.3.3.7 Use of computerised project management technique is only picking up in India. Now a days, softwares are available for project monitoring. But proper use of softwares is yet to be started, With the help of computers, PERT (Programme Evaluation Review Technique) and CPM (Critical Path Method) can be prepared easily and updated also. In private sector, the use of computerised project management technique is 51.03% whereas in public sector the use of computerised project management technique is 43.63%. The details are given below:-

Table 6.18

<u>USE OF COMPUTERISED PROJECT MANAGEMENT TECHNIQUE</u>		
<u>Group</u>	<u>Private sector</u>	<u>Public sector</u>
	<u>%</u>	<u>%</u>
1.Companies in Kerala	48.75	48.33
2.Companies in Orissa	48.13	35.05
3.Companies in aluminium industry	57.5	50.0

4.Companies in chemical industry	51.5	48.25
5.Companies in steel industry	49.25	36.5
	=====	=====
Avarage	51.03	43.63

Source Survey data

These data show that computerised project management techniques are more popular in private sector by 7.5%. Among the various group of companies in private sector the variation is around 9%. But in public sector the variation is about 15%.

6.3.3.8. Use of Network techniques for capital expenditures is a very important parameter as far as project implementation is concerned. In all public sectors, the proposal for capital projects are always attached with a PERT network. Preparing a net work at the initial stage of a project will not do much help. The network is to be analysed at periodic intervals and corrective actions are to be taken, wherever deviations are found out. In situations where a particular activity can be crashed so that crash cost is less than the project cost and the project can be speeded up, it has to be done. Unfortunately the average effectiveness of the use of Network technique is only 63.11% in public sector compared to 76.22% in private sector. The details of collected data are given below:-

Table 6.19

<u>EFFECTIVENESS OF NET WORK TECHNIQUE</u>		
<u>Group</u>	<u>private sector</u>	<u>public sector</u>
	<u>%</u>	<u>%</u>
1.Companies in Kerala	74.29	64.29
2.Companies in Orissa	78.13	53.75
3.Companies in aluminium industry	77.5	72.5
4.Companies in chemical industry	76.65	66.5
5.Companies in steel industry	74.55	58.5
	=====	=====
Avarage	76.22	63.11

Source Survey data

This shows that effective use of network technique is less by 13% in public sector. Variation among the different groups of industries in private sector is hardly 4%. But in public sector the variation is around 19%. Public sector companies in Orissa and the public sector companies in steel industries are very poor in the effective use of network techniques.

6.3.3.9 Post audit is an effective tool to find out what went well in project and also to find out what went wrong. What went well will be a good learning for others who are engaged in project job. What went wrong is to be analysed thoroughly. Cause and effect diagram can be used to identify the root causes. Once the causes are known, corrective actions can be taken at least to reduce these types of problems in future. Audit may be of two types. One is the accounting audit to find out the anomalies and variance in financial terms. The performance audit will analyse the performance of the project in relation to the targets as fixed at the time of conceiving the project. The study shows that post audit is very poor in Indian Industries. It is found that 21.68% of the projects are only subjected to post audit in private sector. In public sector the situation is still worse. It is only 14.8%. Lack of post audit has a multiplying effect. If no audit is done, opportunity for learning from mistakes is lost. This will cut down the effectiveness of forthcoming projects. Details of data collected are given below:-

Table 6.20

<u>EFFECTIVENESS OF POST AUDIT</u>		
<u>Group</u>	<u>Private sector</u>	<u>Public sector</u>
	<u>%</u>	<u>%</u>
1.Companies in Kerala	22.0	18.33
2.Companies in Orissa	21.25	11.88

3.Companies in aluminium industry	25.0	17.5
4.Companies in chemical industry	20.5	13.8
5.Companies in steel industry	19.65	12.5
	=====	=====
Avarage	21.68	14.80

Source Survey data

It is found from the study that the post audit is less by 7% in public sector compared to private sector. Within the different groups of companies, in private sector the variation is less, of the order of 5% only. But in public sector the variation is about 6.5%.

6.4.0 HIGH PROFIT MAKING COMPANIES V/S LOW PROFIT MAKING COMPANIES

The comparisons are made based on various parameters as given below.

6.4.1 The number of companies coming under the heading "High profit making" is 7 and the number of companies coming under "Low profit making" is also 7 from the 27 companies covered by this study. [Ref. 6.1.0]

6.4.2 Average sales during the study period of the two groups are given below:-

High profit making companies Rs. 1022.27Cr.
 Low profit making companies Rs. 530.66Cr.

Details are given below.

Table 6.21

AVERAGE SALES OF HIGH AND LOW PROFIT MAKING COMPANIES

	<u>High profit making companies (Rs. cr.)</u>	<u>Low profit making companies (Rs. cr.)</u>
1	664.93	1521.19
2	1011.0	196.1
3	397.23	4.27
4	658.39	990.17
5	1626.53	973.8
6	6.63	6.98
7	2791.16	22.08
	=====	=====
Av.	1022.27	530.66

Source Survey data

6.4.3 Average profit achieved by the the two groups during the study are given below:-

High profit making companies = Rs.111.22 Cr.

Low profit making companies = Rs. 13.24 Cr.

Details are given below.

Table 6.22

AVERAGE PROFIT OF HIGH AND LOW PROFIT MAKING COMPANIES

	<u>High profit making companies(Rs.cr.)</u>	<u>Low profit making companies(Rs.cr.)</u>
1	137.86	46.822
2	189.33	5.69
3	74.08	0.124
4	67.45	22.744
5	143.195	18.0
6	0.45	0.085
7	166.156	(0.81)
	=====	=====
Av.	111.22	13.24

Source Survey data

Table 6.23 given below shows the average profit of high and low profit making companies as a percentage of sales.

Table 6.23

AVERAGE PROFIT OF HIGH AND LOW PROFIT MAKING COMPANIES
AS % OF SALES

	High profit making companies <u>as % of sales</u>	Low profit making companies <u>as % of sales</u>
1	20.73	3.08
2	18.73	2.9
3	18.65	2.89
4	10.25	2.29
5	8.8	1.85
6	6.798	1.219
7	5.95	(3.67)
	=====	=====
Av.	12.84	1.51

Source Survey data

This shows that profit achieved from high profit making companies is 12.84% of sales compared to a very low figure of 1.51% of low profit making companies.

6.4.4 The average amount of capital expenditure planned and actually spent per year by the companies in two groups are given below:-

	Planned <u>Rs.Cr.</u>	Achieved <u>Rs.Cr.</u>
High profit making companies	128.58	95.395
Low profit making companies	15.41	10.77

Details are shown below.

Table 6.24

CAPITAL EXPENDITURE PLANNED AND ACTUALLY SPENT

	High profit making companies		Low profit making companies	
	Capex plnd	Actual	Capex plnd	Actual
	<u>Rs.Cr.</u>	<u>Rs.Cr.</u>	<u>Rs.Cr.</u>	<u>Rs.Cr.</u>
1	18.5	16.26	47.1	35.55
2	111.0	81.0	7.92	5.9
3	11.88	9.2	0.132	0.1006
4	7.53	5.49	13.26	8.24

5	21.78	17.9	39.0	25.36
6	0.338	0.243	0.118	0.054
7	729.0	537.67	0.325	0.157
	=====	=====	=====	=====
Average	128.58	95.395	15.41	10.77

Source Survey data

6.4.5 Percentage of capital expenditure actually spent by each company in every year against the capital expenditure planned are given below:-

High profit making companies	77.01%
Low profit making companies	63.91%

Details are shown in the following table.

Table 6.25

CAPITAL EXPENDITURE ACHIEVED

	High profit making companies %	Low profit making companies %
1	87.89	75.48
2	72.97	74.49
3	77.44	76.21
4	72.91	62.14
5	82.19	65.02

6	71.89	45.76
7	73.75	48.30
	=====	=====
Average	77.01	63.91

Source Survey data

This shows that in high profit making companies 77.01% of the capital expenditures planned for every year is spent or in otherwords 77.01% of the project can be assumed as implemented, whereas in low profit making companies it is only 63.91%

Exhibit 6.5 shows the capital expenditure incurred against planning as percentage in high profit making companies in relation to the public sector and private sector companies. It reveals that capital expenditure spending is better in high profit making companies, then in private sector companies followed by low profit making companies and then public sector companies.

6.4.6 Capital expenditure planned and actually spent expressed as a percentage of sales are given below:-

	Capex Planned <u>as % of sales</u>	Capex actually spent <u>as % of sales</u>
High profit making companies	6.78	5.31
Low profit making companies	2.67	1.803

Details are shown in Table 6.26.

EXHIBIT - 6.5

CAPITAL EXPENDITURE ACHIEVEMENT

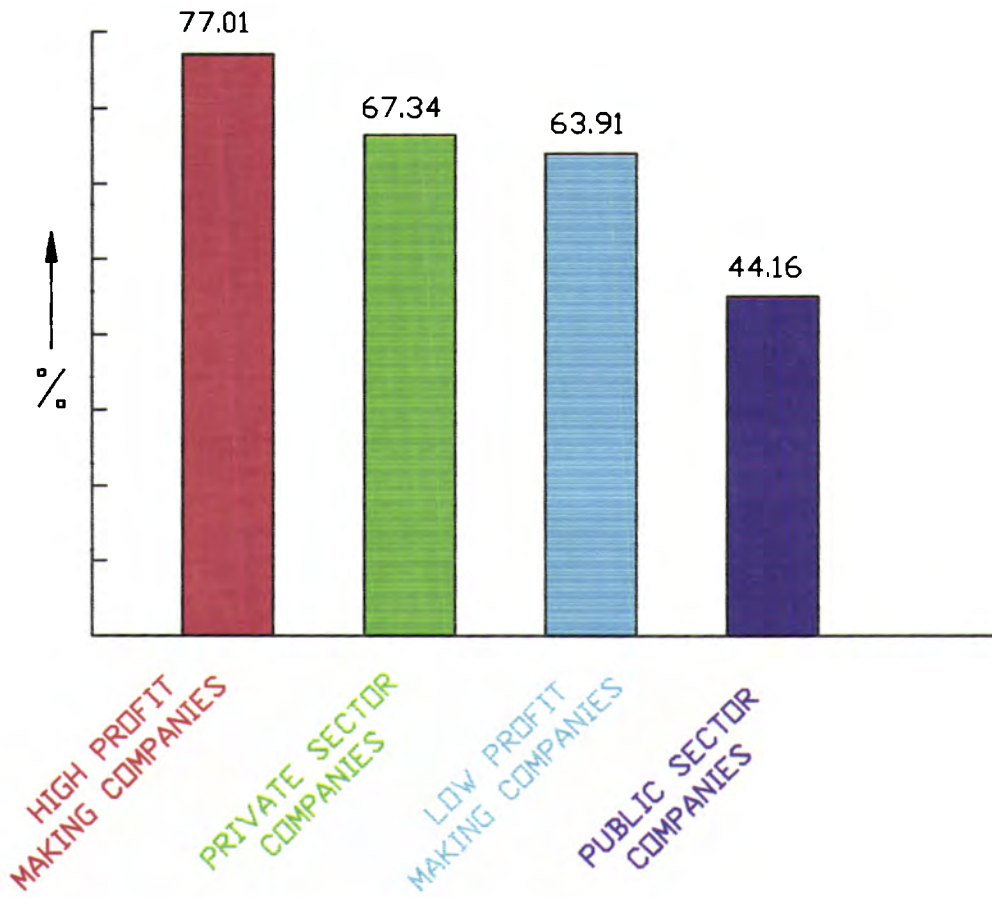


Table 6.26

CAPITAL EXPENDITURE PLANNED V/S ACTUALLY SPENT AS % OF
SALES

	High profit making companies		Low profit making companies	
	<u>Capex plnd</u>	<u>Actual</u>	<u>Capex plnd</u>	<u>Actual</u>
1	2.78	2.45	3.09	2.34
2	10.98	8.01	4.04	3.01
3	2.99	2.32	3.09	2.36
4	1.14	0.834	1.34	0.832
5	1.34	1.1	4.0	2.6
6	5.1	3.67	1.69	0.77
7	26.12	19.26	1.47	0.71
	=====	=====	=====	=====
Average	7.21	5.38	2.67	1.803

Source Survey data

This shows that 7.21% of the sales is the planned capital expenditure in high profit making companies and actually 5.38% of sales is the amount spent for capital expenditure. In the case of low profit making companies 2.67% of sales is planned as capital expenditure and in

actual situation 1.803% of the sales is only spent for implementing capital expenditure projects.

Exhibit 6.6 shows the capital expenditure planned and actually spent as % of sales. Capital expenditure planned and actually spent is high in high profit making companies. Then comes private sector companies followed by public sector and low profit making companies.

6.4.7 Delay in implementation of capital expenditure and increase in capital expenditure project cost are given below.

	<u>Delay in Implementation</u>	<u>Increase in Cost</u>
High profit making companies	11.46	14.42
Low profit making companies	15.55	15.46

Exhibit 6.7 shows the comparison of delay in implementation of capital expenditure by high profit making and low profit making companies in relation to public sector and private sector companies. This shows that delay is the highest in public sector (32.56%) where as it is lower in high profit making companies (11.46%) and in private sector companies it is 23.04%.

EXHIBIT - 6.6

CAPITAL EXPENDITURE PLANNED
V/S ACTUALLY SPENT AS % OF SALES

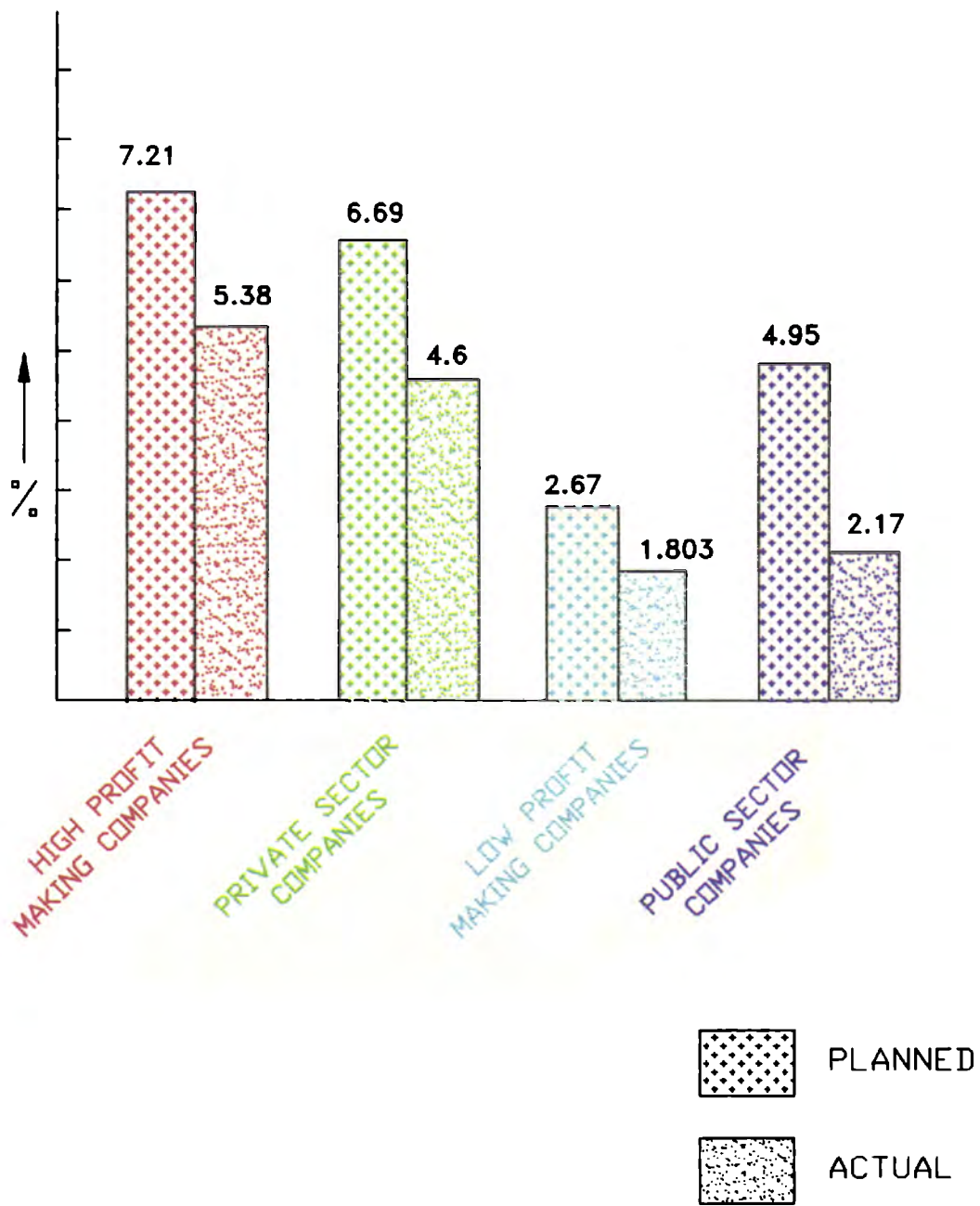
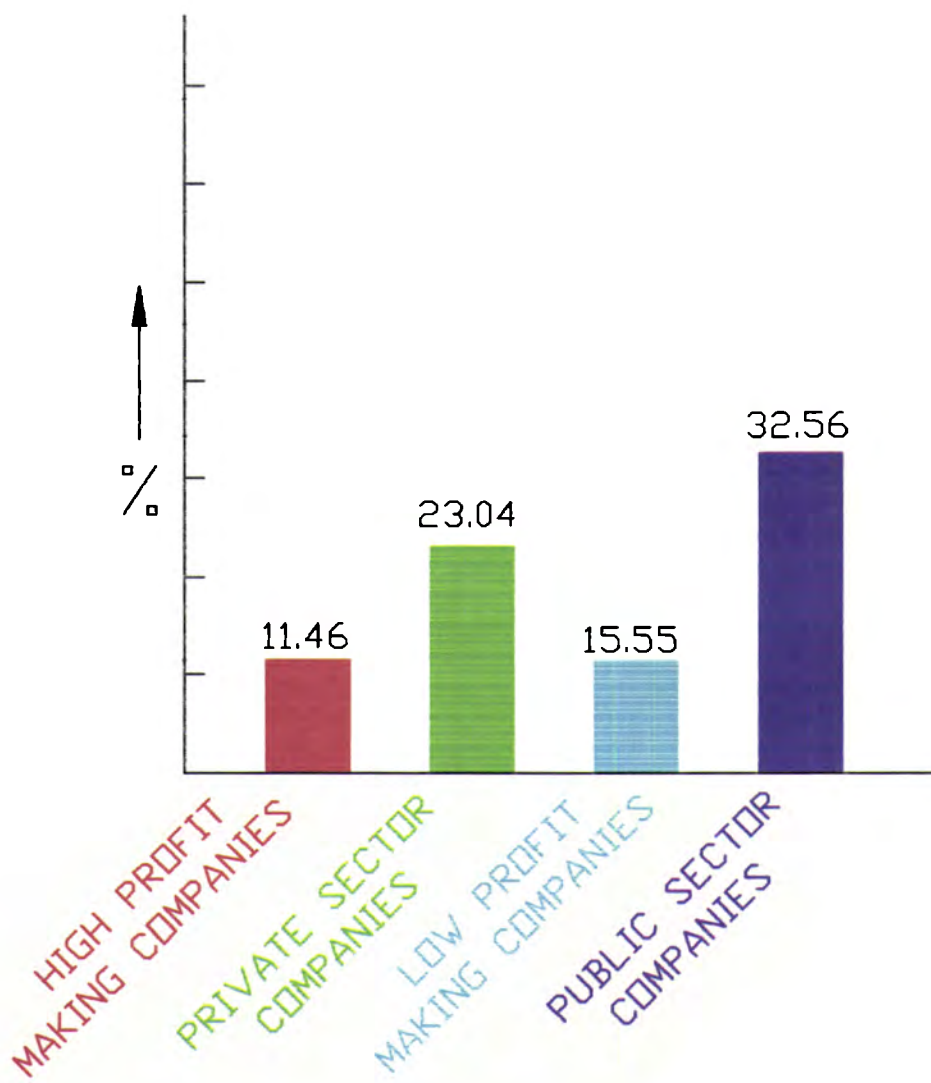


EXHIBIT - 6.7

DELAY IN IMPLEMENTATION



Delay in getting materials/equipment and delay in getting job done for high profit making and low profit making companies are given below.

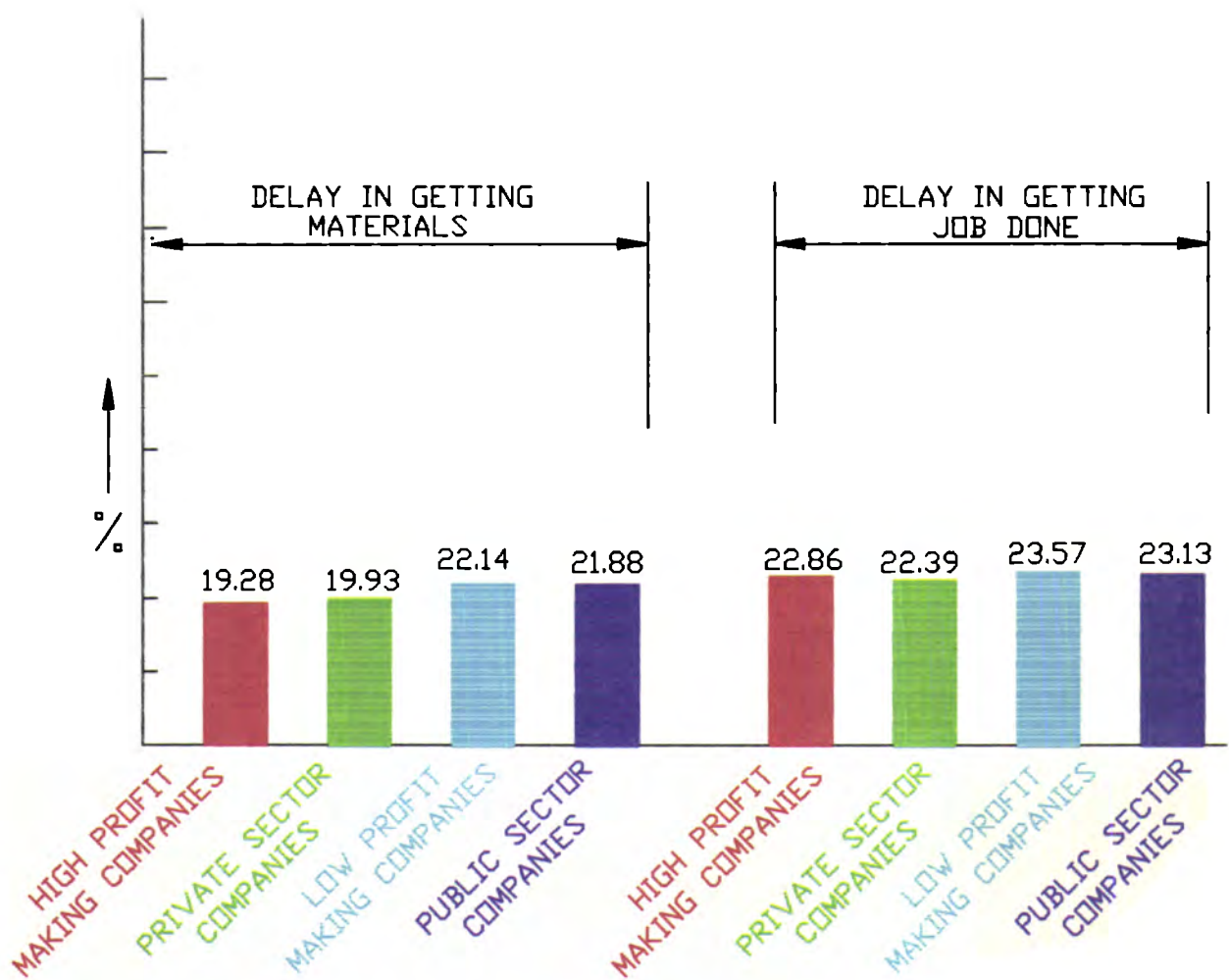
	Delay in getting Materials or Equipment (%)	Delay in getting job done (%)
High profit making companies	19.28	22.86
Low profit making companies	22.14	23.57

This shows that in high profit making companies the delay in getting materials or equipment is low (19.28% compared with 22.14%) in low profit making companies. Similarly the delay in getting job done is also low (22.86%) in high profit making companies compared to 23.57% in low profit making companies.

Exhibit 6.8 shows the comparison of delay in getting materials and getting job done by profit making (High and low) companies in relation to public sector and private sector companies. Delay in getting materials varies from 19.28% in high profit making companies to 22.14% in low profit making companies. Similarly delay in getting job done is lowest in high profit making companies and highest in low profit making companies followed by public sector companies.

EXHIBIT - 6.8

DELAY IN GETTING MATERIALS
AND GETTING JOB DONE



6.4.8 Cost overrun or increase in cost of capital expenditure projects in high profit making and low profit making companies are as follows :-

High profit making companies	14.42%
Low profit making companies	15.46%

This shows that increase in cost of capital expenditure is 14.42% of the high profit making companies where as it is 15.46% in low profit making companies.

The details of cost overrun are shown in exhibit 6.9. It shows that increase in cost is the lowest in high profit making companies and the highest in public sector companies.

6.4.9 Return on expected gain from capital expenditure projects from high profit making and low profit making companies are given below.

High profit making companies	88.57%
Low profit making companies	67.14%

From the analysis it is found that return on expected gain is high (88.57%) in high profit making companies where as it is only 67.14% in low profit making companies.

Details of return on expected gain are shown in Exhibit 6.10.

EXHIBIT - 6.9

INCREASE IN COST

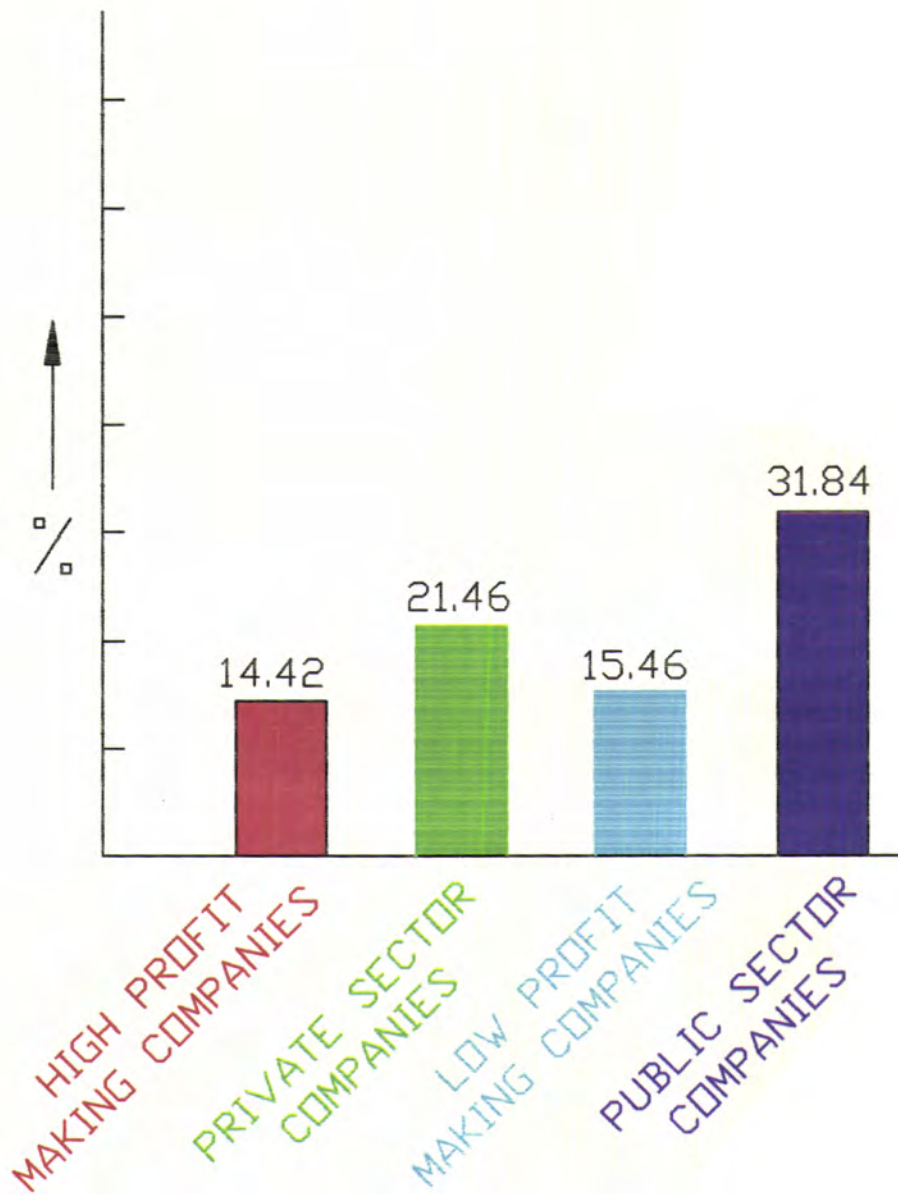
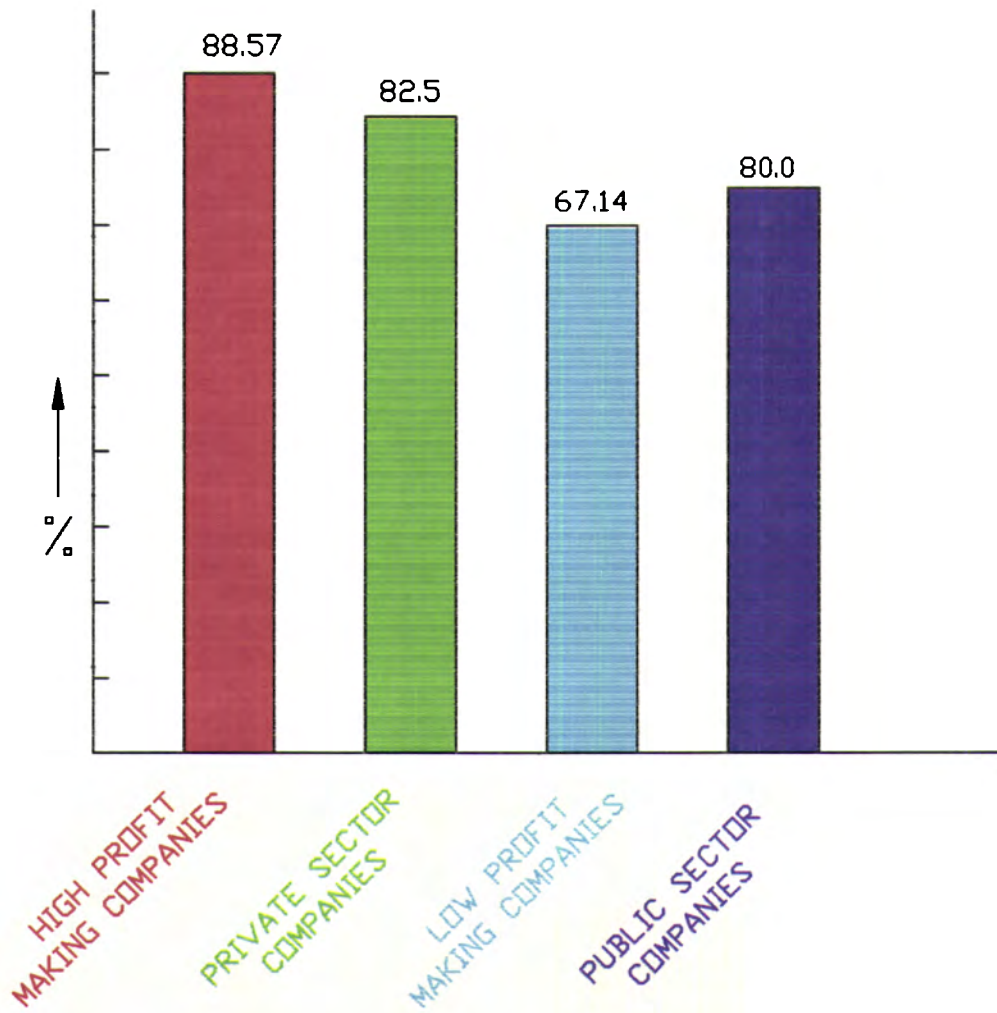


EXHIBIT - 6.10

RETURN ON EXPECTED GAIN



6.4.10 Time taken for planning for routine capital expenditure projects by the high profit making and low profit making companies are given below.

High profit making companies	2.14 years
Low profit making companies	1.29 years

High profit making companies are taking more than 2 years for planning for routine capital expenditure projects, where as low profit making companies take only 1.29 years. In other words high profit making companies are planning this year what they want in next year and the year after next.

6.4.11 Time taken for planning for expansion projects by high and low profit making companies are as follows

High profit making companies	4.71 years
Low profit making companies	4.43 years

Generally for expansion projects time taken for planning is about 4.5 to 5 years in average.

6.4.12 Frequency of meeting for review of capital expenditure projects is generally found to be monthly.

6.4.13 Efficiency of project evaluation in high profit making and low profit making companies are given below.

High profit making companies	90 %
Low profit making companies	73.57 %

In high profit making companies, 90% of the inflows and outflows taken into consideration for evaluation are becoming true. But it is only 73.57% in low profit making companies.

Exhibit 6.11 shows the efficiency of projects evaluation of high and low profit making companies in relation to private sector and public sector companies. This shows that efficiency of project evaluation is highest in high profit making companies (90.00%) and in private sector companies (87.8%) But in public sector companies the efficiency of project evaluation is 78.5% only.

6.4.14. Effectiveness of detailed financial report in high and low profit making companies are given below:

High profit making companies	89.29%
Low profit making companies	72.14%

89.29% of the details specified in the detailed financial report becomes a reality in high profit making companies. But in low profit making companies it is only 72.14%.

Exhibit 6.12 shows the effectiveness of detailed financial report of high and low profit making companies in relation to private and public sector companies.

EXHIBIT - 6.11

EFFICIENCY OF PROJECT EVALUATION

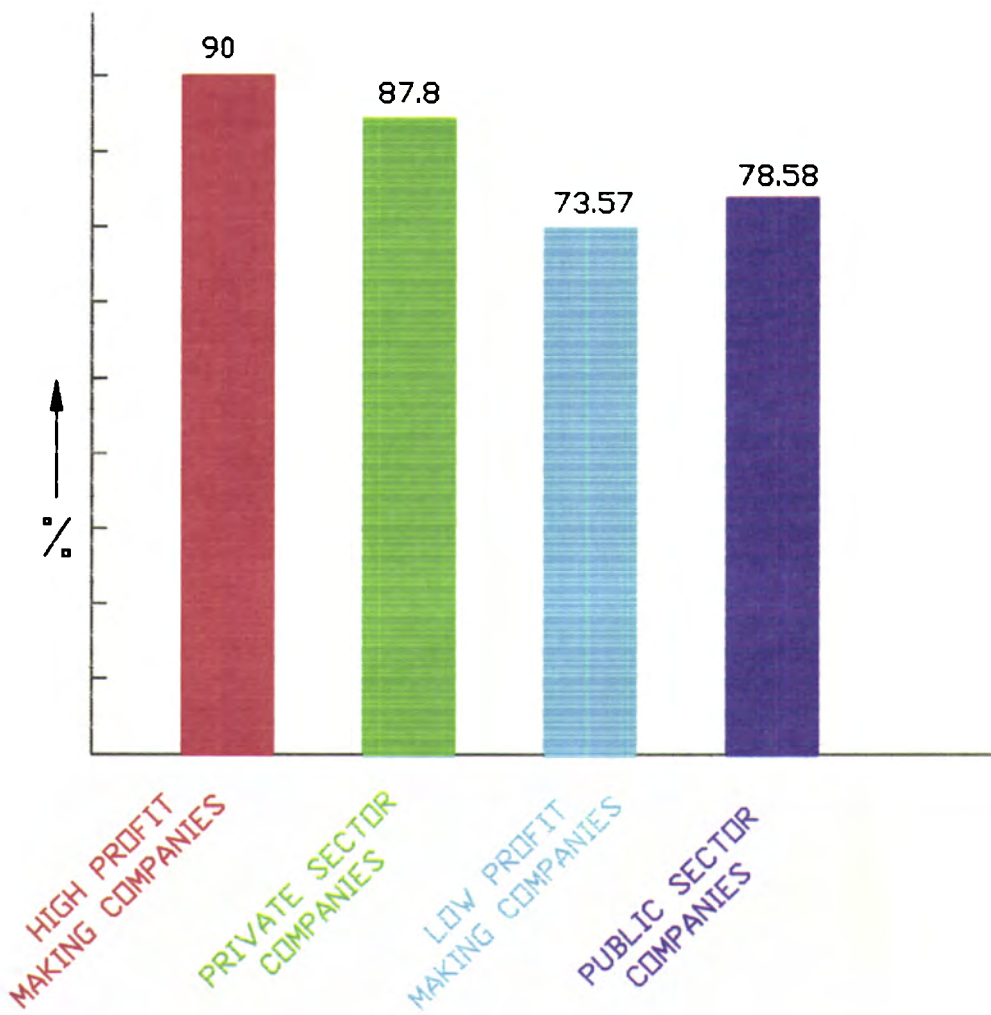
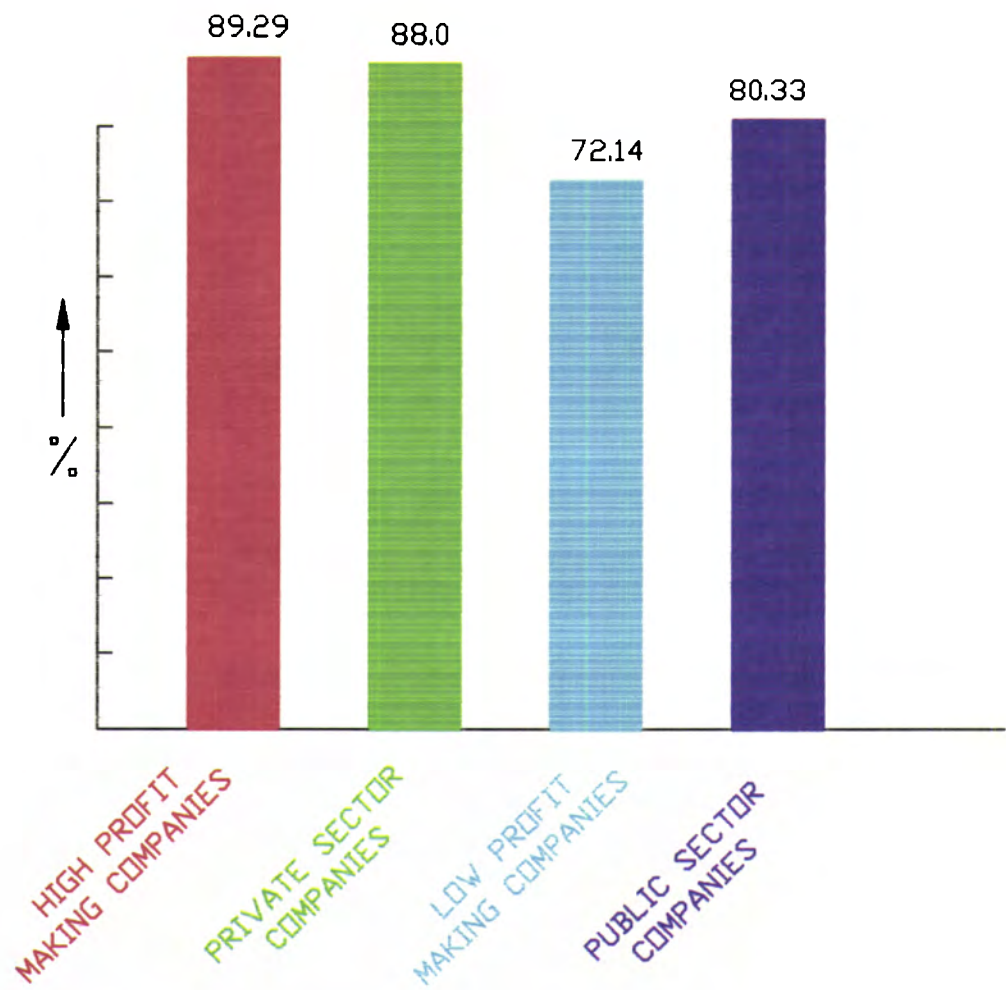


EXHIBIT - 6.12

EFFECTIVENESS OF DETAILED
FINANCIAL REPORT



6.4.15 Effectiveness of project planning and scheduling in high and low profit making companies is as follows:

High profit making companies	90.71%
Low profit making companies	69.29%

More than 90.71% of the project planning and scheduling is achieved in the case of high profit making companies but in low profit making companies it is only 69.29%.

Exhibit 6.13 shows the comparison with private sector and public sector companies alongwith high profit and low profit making companies. It shows that effectiveness of project planning and scheduling is highest in high profit making companies (90.71%) followed by private sector companies (84.54%) In public sector companies the effectiveness is found out to be lowest (68.55%) In low profit making companies it is 69.29%.

6.4.16 Effectiveness of project monitoring in high and low profit making companies is found out to be as follows:

High profit making companies	90.00%
Low profit making companies	69.29%

Project monitoring is very strictly done in high profit making companies (90 %) where as in large profit making companies it is only 69.29%.

EXHIBIT - 6.13

EFFECTIVENESS OF PROJECT
PLANNING AND SCHEDULING

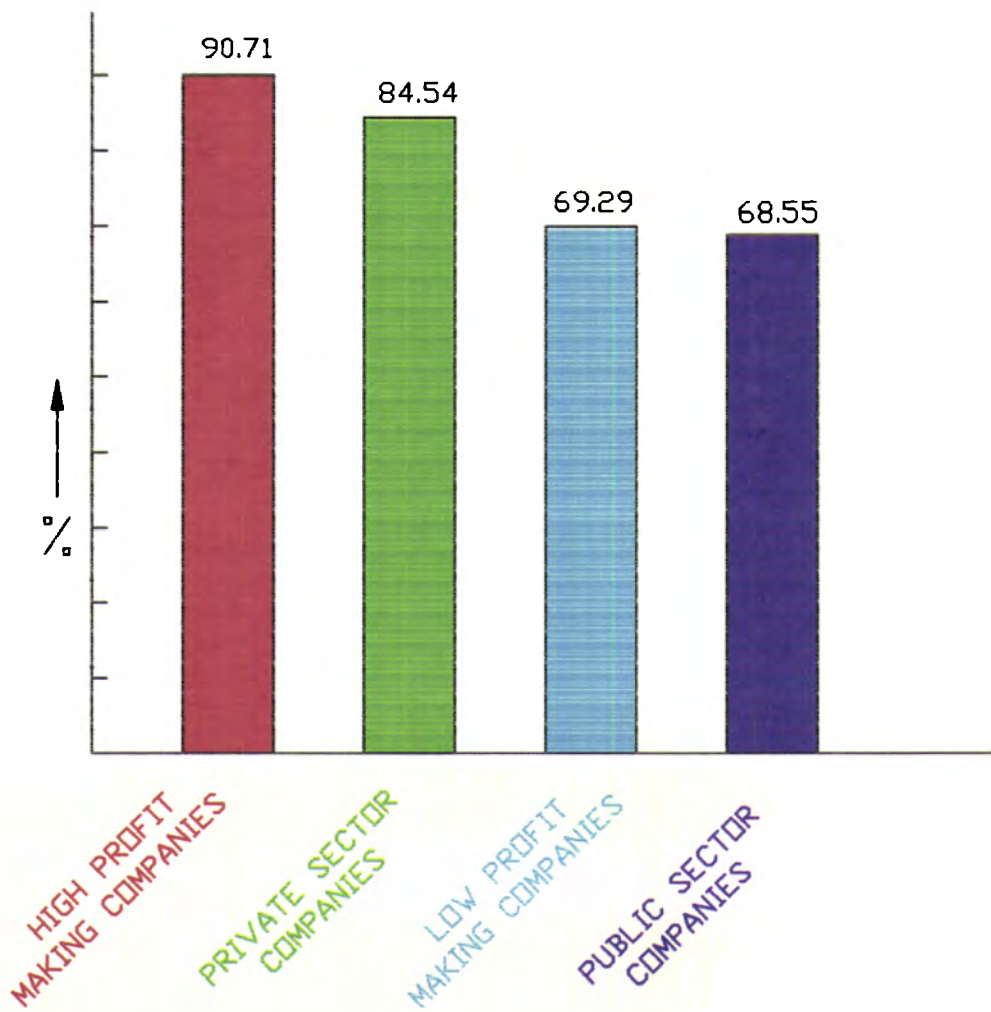


Exhibit 6.14 shows the comparison between high and low profit making companies along with public sector and private sector companies. Effectiveness of project monitoring is high in high profit making companies and private sector companies. It is low in low profit making companies and public sector companies.

6.4.17 Effectiveness of project negotiation in high and low profit making companies is as follows

High profit making companies	85.00%
Low profit making companies	62.86%

In high profit making companies, 85% of what ever wanted by negotiation is achieved but in low profit making companies it is only 62.86%.

Exhibit 6.15 shows the comparison of the effectiveness of project negotiation in profit making companies in relation to public sector and private sector companies. Compared with the private sector companies the effectiveness of project negotiation is found out to be 16% less in public sector companies.

6.4.18 Use of computerised project management technique is found to be varying from high profit making companies to low profit making companies as follows

High profit making companies	73.57 %
Low profit making companies	55.71 %

EXHIBIT - 6.14

EFFECTIVENESS OF PROJECT
MONITORING

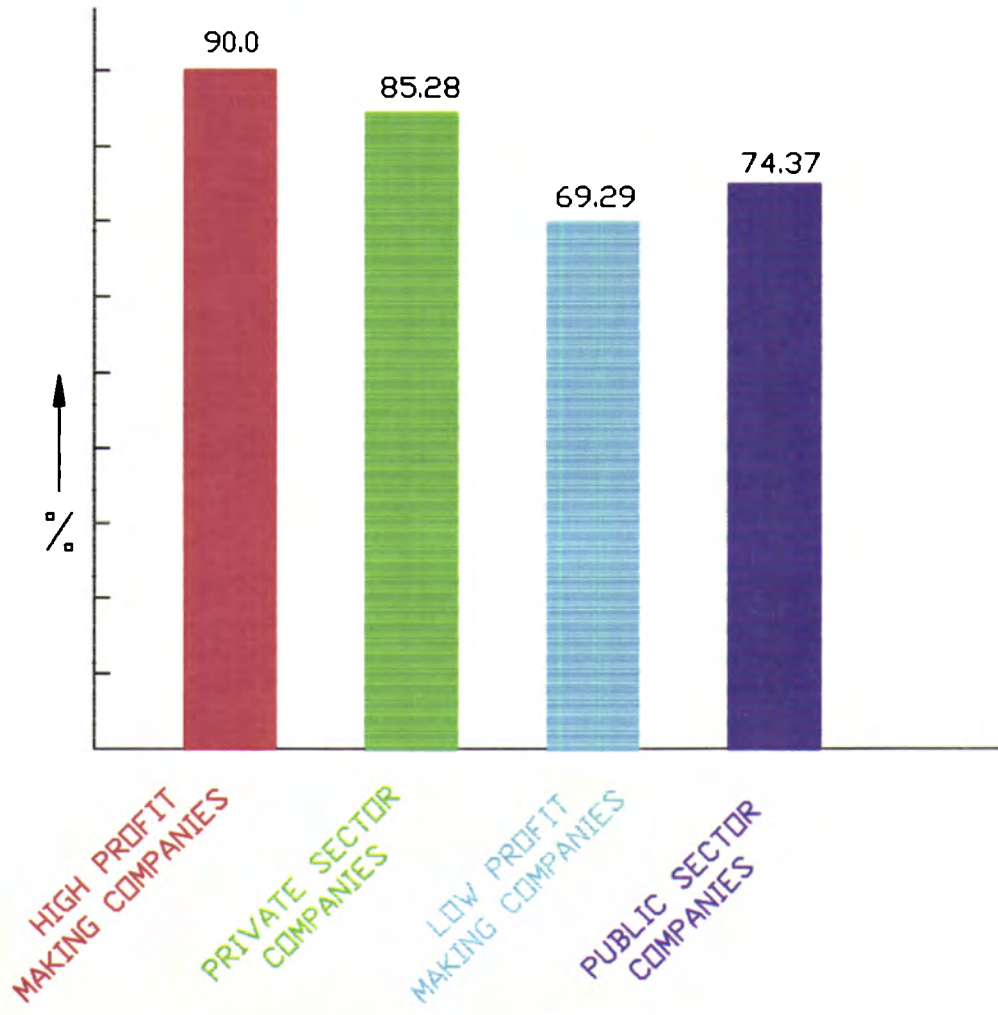
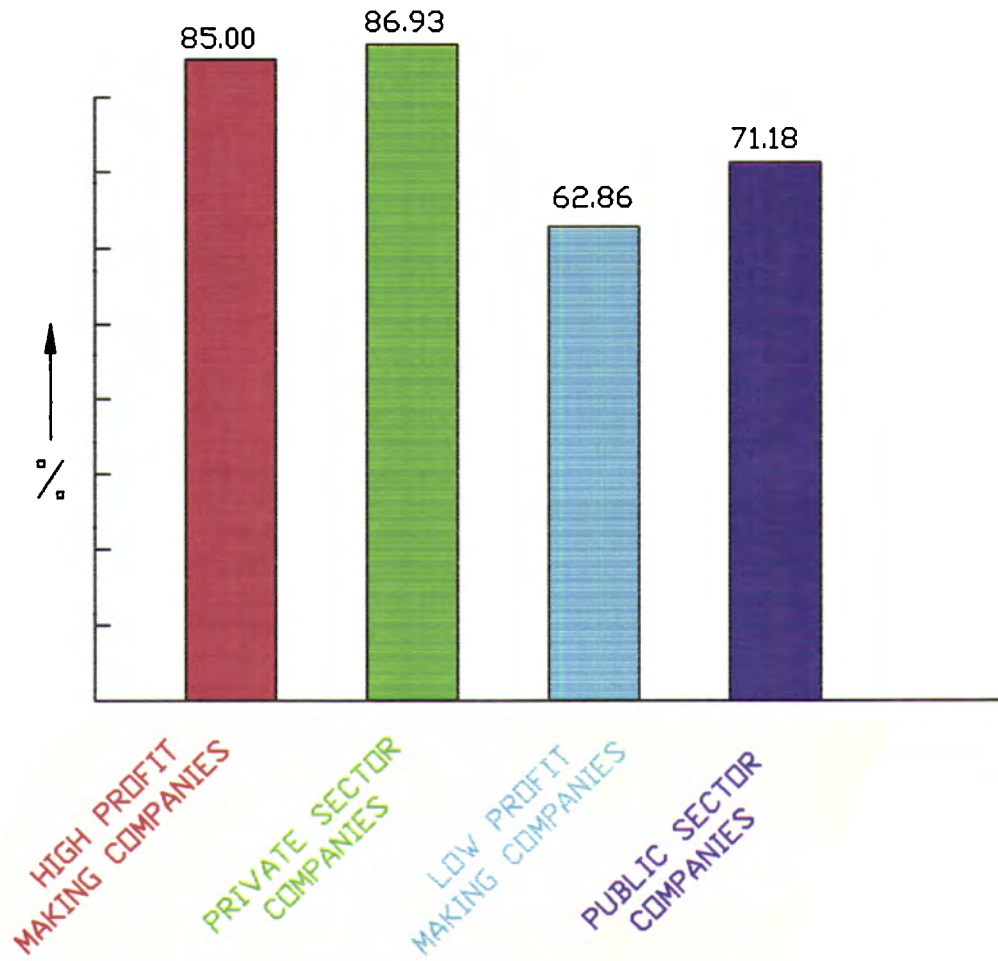


EXHIBIT - 6.15

EFFECTIVENESS OF PROJECT
NEGOTIATION



Computerised project management techniques were found being used in 73.57% of high profit making companies. In low profit making companies it is 55.71%.

Exhibit 6.16 shows the percentage use of computerised project management techniques in high and low profit making companies along with the use in private sector and public sector companies.

6.4.19 Effectiveness of the use of network technique in high profit making companies and low profit making companies are given below:-

High profit making companies	70.71%
Low profit making companies	60.71%

More than 70.71% of the high profit making companies are using the network techniques effectively .But in low profit making companies it is only 60.71%.

Exhibit 6.17 shows the effectiveness of the use of network techniques in high and low profit making companies along with those companies in private sector and public sector.

EXHIBIT - 6.16

USE OF COMPUTERISED PROJECT
MANAGEMENT TECHNIQUE

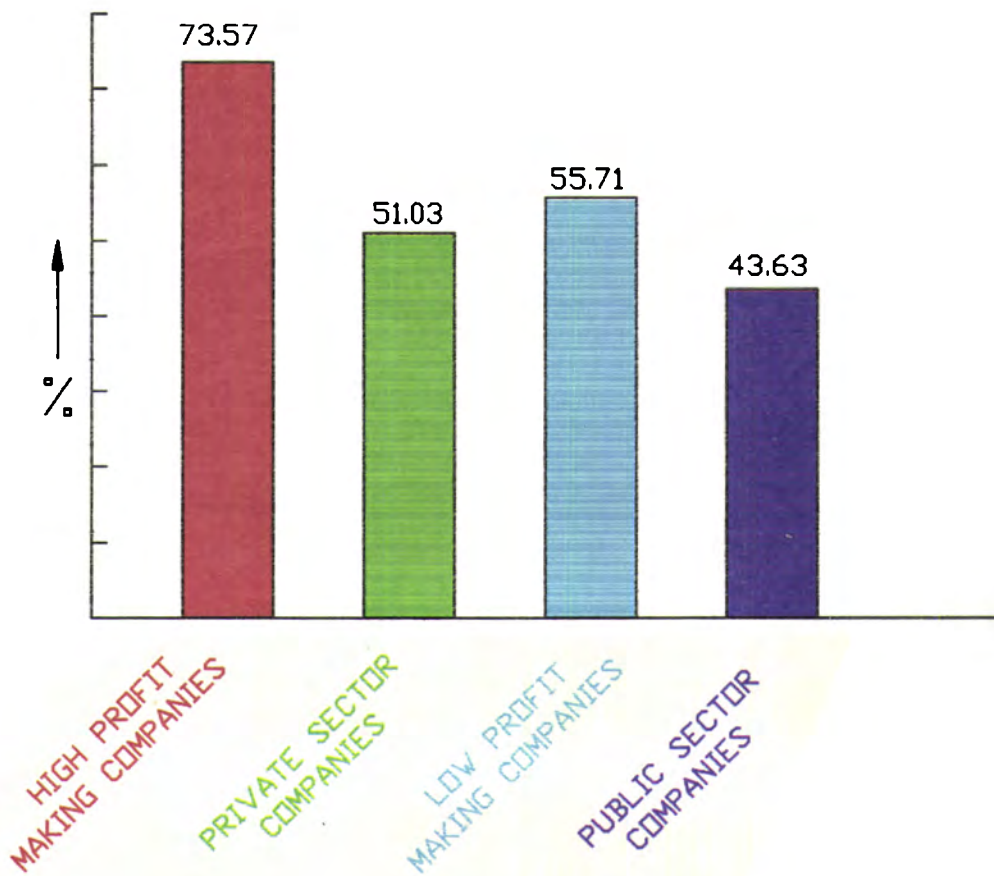
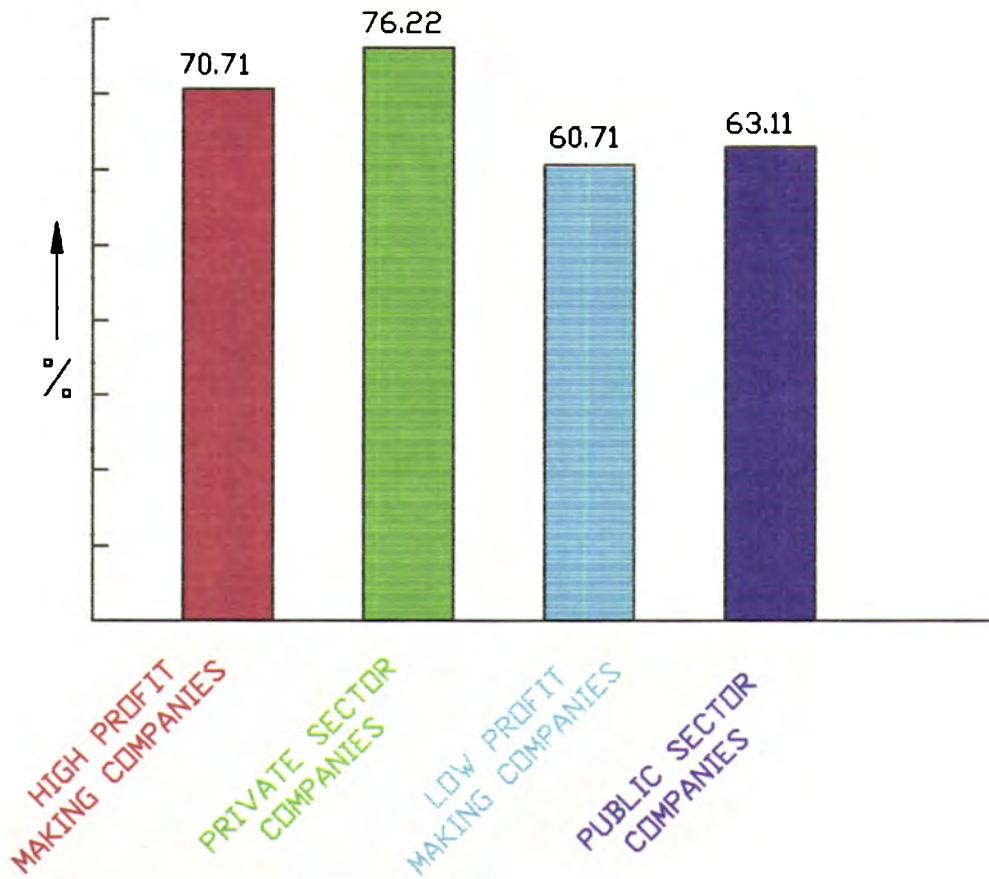


EXHIBIT - 6.17

EFFECTIVENESS OF NETWORK
TECHNIQUES



6.4.20 Effectiveness of post audit is found out to be different in high and low profit making companies. The collected data shows the following

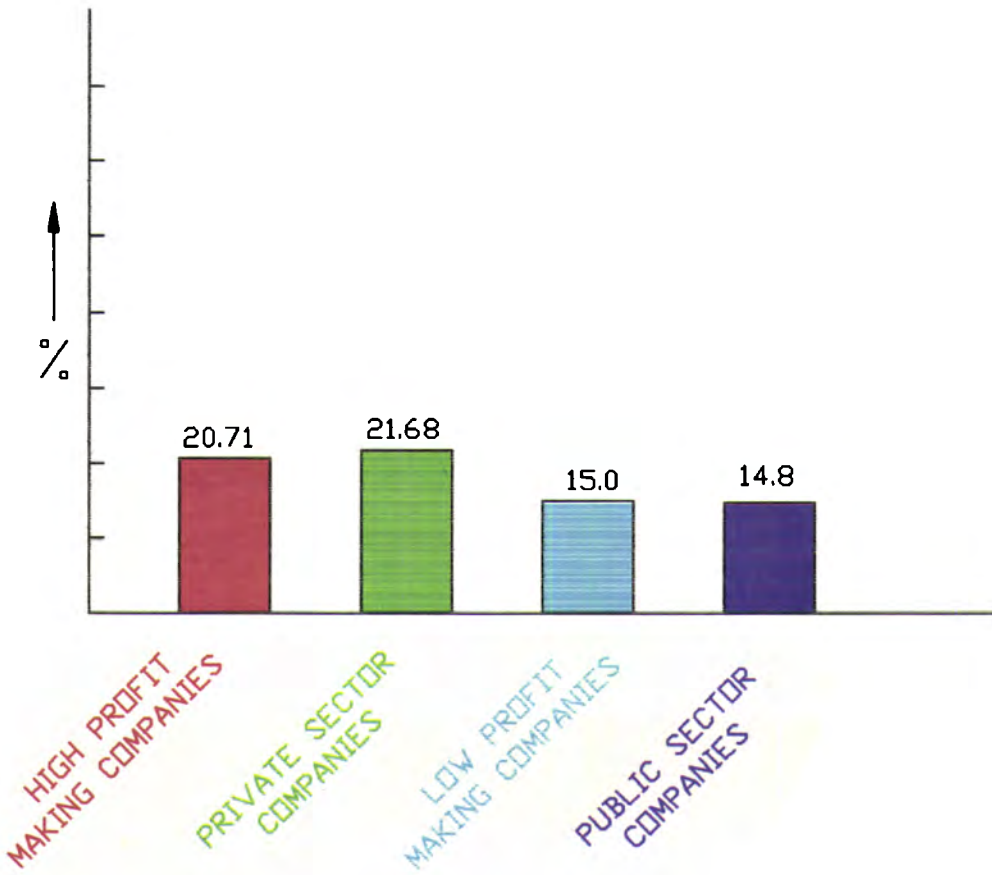
High profit making companies	20.71%
Low profit making companies	15.00%

Post audit is low in Indian companies. In high profit making companies it is only 20.7%. In low profit making companies, only 15% of the capital expenditure project are subjected to post audit.

Exhibit 6.18 shows the effectiveness of post audit in high and low profit making companies in relation to private sector and public sector companies. It shows that effectiveness of post audit is 20.71% and 21.68% in high profit making companies and private sector companies respectively. But in public sector companies it is only 14.80%.

EXHIBIT - 6.18

EFFECTIVENESS OF POST AUDIT



6.5.0. Test Of Significance

To test the significance of the results obtained from the collected data Student's t-distribution is used as the sample size is below 30. The value of t can be calculated from the formula,

$$t = \frac{\bar{X}_1 - \bar{X}_2}{S} \sqrt{\frac{n_1 n_2}{n_1 + n_2}}$$

where, \bar{X}_1 = mean of one sample

\bar{X}_2 = mean of other sample

n_1 = number of observations in first sample

n_2 = number of observations in second sample

S = combined standard deviation

$$= \sqrt{\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2}}$$

where, S_1 = standard deviation of first sample

S_2 = standard deviation of second sample

If the calculated value of t is greater than theoretical value (statistical value at 5% level) the hypothesis that the difference between the sample means is significant at 5% level of confidence is accepted. If the calculated value is less than the theoretical value the difference between the sample means is said to be insignificant or in other words the hypothesis is rejected.

The level of significance or confidence of 5% denotes that even if the hypothesis is accepted, there is a risk of accepting wrong decision in 5% of the cases.

Statistical method of testing the significance of the analysed data is used to prove the hypothesis that the mean of the profit earned by the private sector companies is significantly different from the mean of the profit earned by the public sector companies at 5% level of confidence. Similarly it is proved that capital expenditure actually spent as percentage of sales by private sector companies is significantly different from that of public sector companies.

6.5.1 Test for profit

From table 6.4, the number of companies coming in various intervals say, 1 to 2%, 2 to 3% etc, separately for private and public sector are found out. Mean and standard deviation of the distribution are calculated as shown in Table 6.27 for private sector companies and Table 6.28 for public sector companies.

Table 6.27

PROFIT AS % OF SALES - Private sector

class interval	frequency <u>f</u>	mid value <u>m</u>	deviation <u>d=m-A (A=5.5)</u>	<u>f.d</u>	<u>d</u>	<u>f.d</u>
-2 -1	1	-1.5	-7	-7	49	49
-1 -0	0	-0.5	-6	0	36	0

0	1	0	0.5	-5	0	25	0
1	2	4	1.5	-4	-16	16	64
2	3	0	2.5	-3	0	9	0
3	4	0	3.5	-2	0	4	0
4	5	1	4.5	-1	-1	1	1
5	6	1	5.5	0	0	0	0
6	7	1	6.5	1	1	1	1
7	8	1	7.5	2	2	4	4
8	9	0	8.5	3	0	9	0
9	10	1	9.5	4	4	16	16
10	11	0	10.5	5	0	25	0
11	12	1	11.5	6	6	36	36
12	13	0	12.5	7	0	49	0
13	14	1	13.5	8	8	64	64
14	15	0	14.5	9	0	81	0
15	16	0	15.5	10	0	100	0
16	17	0	16.5	11	0	121	0
17	18	0	17.5	12	0	144	0
18	19	1	18.5	13	13	169	169
19	20	1	19.5	14	14	196	196
		-----			-----	-----	
		14			24	600	

Source: Survey data

$$\text{Mean } \bar{X} = A + \frac{\sum fd}{N}$$

$$\text{Standard deviation } S = \sqrt{\frac{\sum fd^2}{N} - \left(\frac{\sum fd}{N}\right)^2} \times i$$

where i is the class interval

A =the assumed mean and N = f=Total number of observations

$$\bar{X}_1 = 5.5 + \frac{24}{14} = 5.5 + 1.714 = 7.214$$

=====

$$S_1 = \sqrt{\frac{600}{14} - \frac{24^2}{14}} \times 1 = \sqrt{42.857 - 2.938} = 6.318$$

=====

(Even though the number of observations are 15 one observation is not considered as the dispersion is very high.)

Table 6.28

PROFIT AS % OF SALES - Public sector

class interval	frequency f	mid value m	deviation d=m-A (A=4.5)	f.d	d	f.d
-9 -8	1	-8.5	-13	-13	169	169
-8 -7	0	-7.5	-12	0	144	0
-7 -6	0	-6.5	-11	0	121	0
-6 -5	2	-5.5	-10	-20	100	200
-5 -4	2	-4.5	-9	-18	81	162
-4 -3	0	-3.5	-8	0	64	0
-3 -2	0	-2.5	-7	0	49	0
-2 -1	0	-1.5	-6	0	36	0
-1 -0	0	-0.5	-5	0	25	0
0 1	0	0.5	-4	0	16	0
1 2	1	1.5	-3	-3	9	9
2 3	1	2.5	-2	-2	4	4
3 4	2	3.5	-1	-2	1	2

4	5	0	4.5	0	0	0	0
5	6	1	5.5	1	1	1	1
6	7	0	6.5	2	0	4	0
7	8	1	7.5	3	3	9	9
8	9	1	8.5	4	4	16	16
9	10	0	9.5	5	0	25	0
10	11	0	10.5	6	0	36	0
11	12	1	11.5	7	7	49	49
12	13	1	12.5	8	8	64	64
13	14	0	13.5	9	0	81	0
14	15	0	14.5	10	0	100	0
15	16	1	15.5	11	11	121	121
	--				---		---
		15			-24		806

Source: Survey data

$$\bar{X}_2 = 4.5 - \frac{24}{15} = 4.5 - 1.6 = 2.9$$

$$S_2 = \sqrt{\frac{806}{15} - \frac{24^2}{15 \times 15}} \times 1 = \sqrt{53.737 - 2.56} = 7.154$$

(Even though the number of observations are 16 one observation is not considered as the dispersion is very high.)

With the mean and standard deviation of the two distributions, value of t is calculated as given below:-

$$\bar{X}_1 = 7.214 \quad |$$

$$S_1 = 6.318 \quad | \text{ Private sector companies (Table 6.27)}$$

$$\bar{X}_2 = 2.9 \quad |$$

$$S_2 = 7.154 \quad | \text{ Public sector companies (Table 6.28)}$$

$$S = \sqrt{\frac{13 \times 6.318^2 + 14 \times 7.154^2}{27}}$$

$$= 6.764$$

=====

$$t = \frac{7.214 - 2.9}{6.764} \sqrt{\frac{14 \times 15}{14+15}}$$

$$= 1.716$$

=====

Value of t at 5% level of confidence and 27 degrees (n+n-2) of freedom from statistical table is 1.703. Since the calculated value is greater than the theoretical value, the mean of both the distributions are significantly different and hence the profit earned by private sector companies are different from public sector companies.

This shows that private sector companies are distinctly different from public sector companies as far as profit as percentage of sales is concerned.

6.5.2 Test for capital expenditure actually spent

As narrated in 6.5.1 the number of companies in various intervals of capital expenditure actually spent as percentage of sales are found out from Table 6.7 separately for private and public sector companies. Mean and standard deviation are calculated as shown in Table 6.29 and 6.30.

Table 6.29

CAPITAL EXPENDITURE ACTUALLY SPENT AS % OF SALES(Private Sector)

class interval	frequency f	mid value m	deviation d=m-A (A=5.5)	f.d	d	f.d
0 1	3	0.5	-5	-15	25	75
1 2	3	1.5	-4	-12	16	48
2 3	2	2.5	-3	-6	9	18
3 4	1	3.5	-2	-2	4	4
4 5	1	4.5	-1	-1	1	1
5 6	1	5.5	0	0	0	0
6 7	1	6.5	1	1	1	1
7 8	0	7.5	2	0	4	0
8 9	1	8.5	3	3	9	9
9 10	0	9.5	4	0	16	0
10 11	0	10.5	5	0	25	0
11 12	1	11.5	6	6	36	36
	14			-26		192

Source: Survey data

$$\bar{X}_1 = 5.5 - \frac{26}{14} = 5.5 - 1.857 = 3.643$$

=====

$$S_1 = \sqrt{\frac{192}{14} - \frac{26^2}{14^2}} \times 1 = \sqrt{13.714 - 3.448} = 3.204$$

=====

Table 6.30

CAPITAL EXPENDITURE ACTUALLY SPENT AS % OF SALES
(Public Sector)

class interval	frequency f	mid value m	deviation d=m-A (A=1.5)	f.d	d	f.d
0 1	9	0.5	-1	9	1	9
1 2	2	1.5	0	0	0	0
2 3	2	2.5	1	2	1	2
3 4	0	3.5	2	0	4	0
4 5	1	4.5	3	3	9	9
5 6	2	5.5	4	8	16	32
-----				-----		-----
	16			4		52

Source: Survey data

$$\bar{X}_2 = 1.5 + \frac{4}{16} = 1.5 + 0.25 = 1.75$$

=====

$$S_2 = \sqrt{\frac{52}{16} - \frac{4^2}{16^2}} \times 1 = \sqrt{3.25 - 0.0625} = 1.785$$

=====

Value of t is calculated as follows:-

$$\bar{X}_1 = 3.643 \quad |$$

$$S_1 = 3.204 \quad | \text{ Private sector companies (Table 6.29)}$$

$$\bar{X}_2 = 1.75 \quad |$$

$$S_2 = 1.785 \quad | \text{ Public sector companies (Table 6.30)}$$

$$S = \sqrt{\frac{13 \times 3.204 + 15 \times 1.785}{28}} = 2.544$$

=====

$$t = \frac{3.643 - 1.75}{2.544} \sqrt{\frac{14 \times 16}{14+16}}$$

$$= 2.033$$

=====

Value of t from statistical table at 5% level and 28 degrees of freedom is 1.701. Since the calculated value is greater than theoretical value, there is significant difference between these two means and hence these two distributions are different and hence capital expenditure spent in private sector companies is definitely different than the public sector companies.

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CHAPTER - VII

C H A P T E R - V I I

CONCLUSION

This chapter presents the conclusions of the study based on the analysis done in previous chapters.

As stated earlier the objective of this study is to systematically analyse the capital expenditure decision in private and public sector enterprises and to compare the findings and recommend possible improvements to enable public sector also to perform like private sector enterprises.

[1] The first hypothesis of this study is that the performance of public sector enterprises is poor compared with private sector enterprises.

From the analysis it is found that average profit earned by the public sector during the period of study as a percentage of sales is only 5.62 (ref. Table 6.4 - Chapter VI) in the five groups of companies studied under the public sector.

The performance of private sector companies is comparatively good. Profit during the period of study as a percentage of sales in all the groups of companies studied is 7.91 (ref. Table 6.4 - Chapter VI)

Moreover, the difference of the mean of the profit earned by the sample private sector enterprises is statistically significant from the mean of the sample public sector enterprises covered by this study (ref.6.5.1 in Chapter VI)

The hypothesis that the performance of public sector enterprises is poor compared with private sector enterprises is thus accepted.

[2] The second hypothesis of this study is that performance of public sector enterprises can be improved by improving the capital expenditure decision.

The following findings from the analysis show that capital expenditure decisions in public sector companies are poor compared to the decisions in private sector companies.

[a] The actual amount of capital expenditure spent against the planning in every year is low in public sector (44.16%) compared with private sector (67.34%) This has been found out in 6.3.1.5 (chapter VI) Also it is found out that capital expenditure planned in every year as a percentage of sales is high in private sector (6.69%) against public sector (4.95%) Similarly the actual capital expenditure amount spent in every year as a percentage of sales is high in private sector (4.60%) against public sector (2.17%) This is evident from the analysis done in 6.3.1.6 (chapter VI) This also shows that spending of capital expenditure against planning is high in private

sector companies compared with public sector. The same pattern is found true in high profit making companies compared with low profit making companies in private sector also.

The difference of the mean of the capital expenditure actually spent as percentage of sales by the sample private sector companies from the mean of the capital expenditure actually spent by the public sector companies is found statistically significant (ref. 6.5.2 - Chapter VI)

[b] Effectiveness of project planning and scheduling is better in private sector (84.54%) compared with (68.55%) public sector (ref. Table 6.15) Similarly in project monitoring the effectiveness is 85.28% in private sector against 74.37% in public sector (ref. Table 6.16)

[c] The delay in capital expenditure implementation is low in private sector - 23.04% - against 32.56% in public sector (ref. 6.3.3.1 of chapter VI)

[d] The increase in cost is low in private sector (21.46%) compared with 31.84% in the public sector (ref.6.3.3.1 of chapter VI)

[e] Post audit is very poor in Indian companies. In private sector it is 21.68%. In public sector, it is only 14.8% (ref. Table 6.20)

For comparing the results, the findings of the analysis are tabulated in Table 7.1

Table 7.1
Comparison of analysed data

Description -----	Private <u>sector</u>	Public <u>sector</u>
1. Profit as % of sales	7.91%	5.62%
2. Capital expenditure actually spent against planning	67.34%	44.16%
3. Planning for capital expenditure	1.509 y	1.892y
4. Planning for non-routine capital expenditure	5.1 y	5.3 y
5. Use of evaluation method		
Payback method	100.00%	100.00%
DCF method	61.54%	75.00%
NPV method	15.40%	43.75%
6. Efficiency of project evaluation	87.80%	78.58%
7. Effectiveness of detailed financial report	88.00%	80.33%
8. Delay in implementation	23.04%	32.56%
9. Increase in cost	21.46%	31.84%
10. Effectiveness of project planning and scheduling	84.54%	68.55%
11. Effectiveness of project monitoring	85.28%	74.37%
12. Effectiveness of negotiation	86.93%	71.18%
13. Use of computerised project management technique	51.03%	43.63%
14. Effectiveness of network technique	76.22%	63.11%
15. Effectiveness of post audit	21.68%	14.80%

Source: Survey data

Table 7.1 shows that profit is low in public sector and capital expenditure, both planning and implementation, are better in private sector. But time taken for planning capital expenditure for routine and non-routine jobs are almost the same in private and public sector companies. In the case of capital expenditure evaluation, public sector companies are found using more of discounted cashflow and net present value method compared with private sector. Everybody is using payback method.

This leads to the conclusion that in the case of planning and evaluation of capital expenditure, public sector companies are equally competent or even slightly better than private sector companies. In other words, public sector companies generally do a detailed planning and evaluation.

But in the case of efficiency of project evaluation, effectiveness of detailed financial report, project planning and scheduling, project monitoring, project negotiation etc., private sector companies are better than public sector. This shows that effectiveness of planning and control is low in public sector compared with private sector. Similarly the delay in implementation and increase in cost are about 33% less in private sector compared with public sector companies. Private sector companies are found using more modern network techniques and computerised project management techniques. Effectiveness of post auditing is 50% more in private sector compared with public sector.

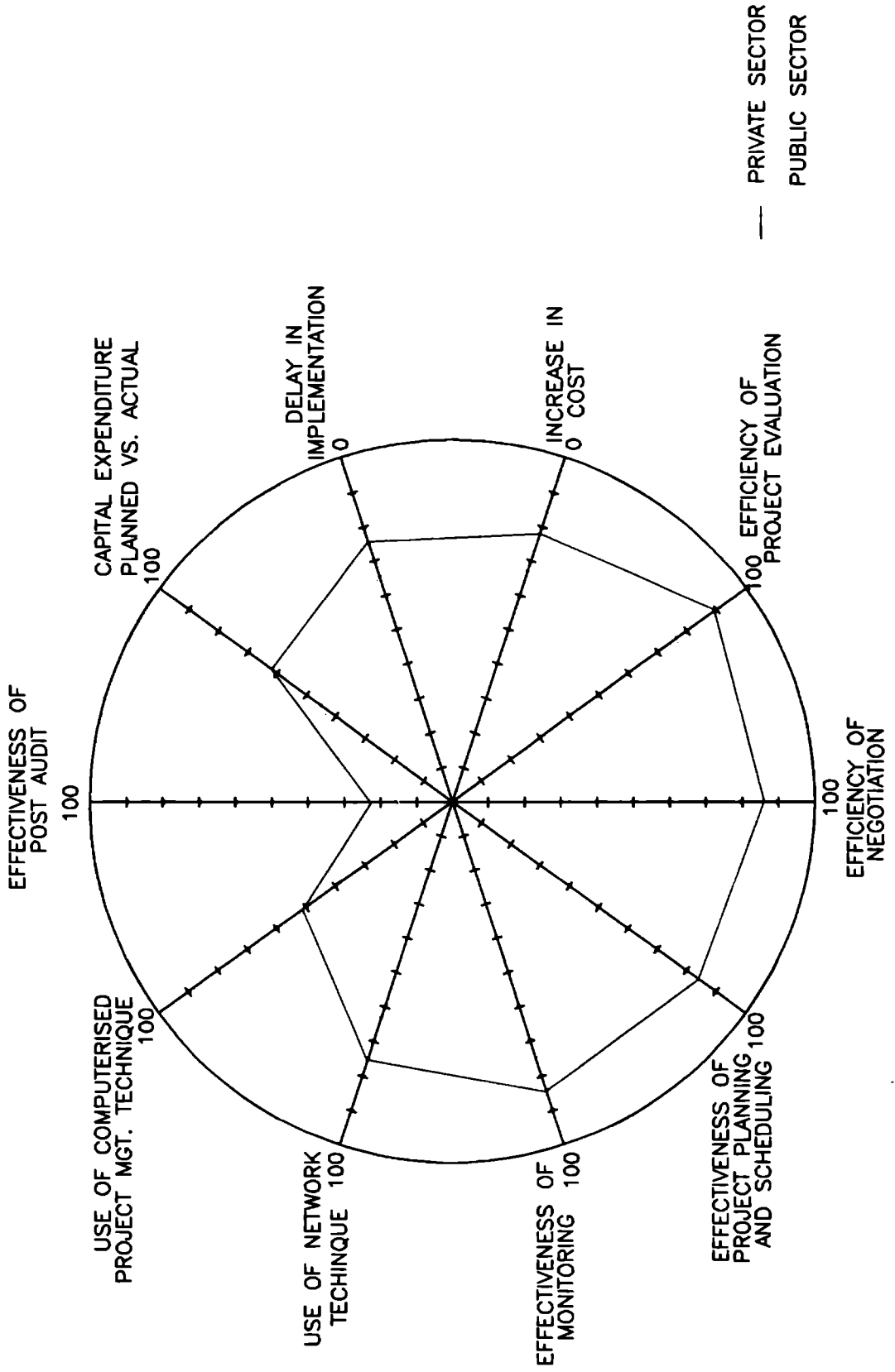
This study shows that there is not much difference between public sector and private sector companies in planning and in evaluation of capital expenditure, but there is significant difference in the effectiveness of scheduling, monitoring, negotiation etc, Delay in implementation and increase in cost are the two areas where private sectors companies are far better than public sector companies. If proper attention is given to these areas capital expenditure decision in public sector will also be better as in the case of private sector and hence the performance of the companies.

To get a bird's eyeview the various parameters related to the performance of capital expenditure are plotted in a radar chart - Exhibit 7.1 for comparison.

Radar chart is a chart used to compare various parameters. For example, implementation of capital expenditure is excellent if the delay is zero. The radius of the radar chart is divided into 10 parts starting from zero at the circumference and ending at 100% at the centre of the radar circle. Depending on the percentage of delay it may vary from zero to 100. Similarly for effectiveness of project evaluation, if the effectiveness is 100% it will be on the circumference. On the other hand if the effectiveness is zero, it will be at the centre of the circle. In other words, the location of a parameter if moves towards the circumference it will be better, if it is moving towards the centre, it will be bad. By joining all the points of the parameters the radar chart is obtained.

EXHIBIT 7.1

RADAR CHART SHOWING THE PERFORMANCE OF PRIVATE AND PUBLIC SECTOR COMPANIES



After plotting various parameters related to capital expenditure, it is found that the points related to private sector are moving towards the circumference and hence its performance is better, whereas the points related to public sector are more close to the centre than the private sector and hence the performance of capital expenditure in public sector is poor compared with private sector. Since capital expenditure being the 'lubricant' which keeps the 'wheels of the industry' moving, it can be concluded that the main reason for the poor performance of public sector enterprises is the poor capital expenditure decision.

The analysis also shows that the low performing private sector companies are also poor in capital expenditure decision compared to the high performing private sector companies. For example, the percentage of capital expenditure actually spent against planning is high (77.01%) in high profit making companies and it is low (63.91%) in low profit making companies. Also it is found that capital expenditure planned as a percentage of sales is high (6.78%) in high profit making companies compared with 2.67% in low profit making companies. Similarly the actual capital expenditure amount spent as a percentage of sales is high (5.31%) in high profit making companies compared with 1.803% in low profit making companies. (ref.6.4.6 of chapter VI)

This shows that even in private sector companies capital expenditure management is poor in low profit making companies compared with the high profit making companies.

If the capital expenditure spending is improved against the planning, the return or gain from the capital expenditure project will also improve. This will add to the profit of the company and hence to the growth of the company. If whatever capital expenditure planned is not spent, more than the loss of expected return or gain from the project, the amount blocked, either own capital or borrowed capital will result in a cost to the company either as lost opportunity or as interest charges paid. This will adversely affect the profit of the company.

This leads to the conclusion that if the capital expenditure decisions are improved, the performance of the companies will also be improved. Therefore the hypothesis that performance of public sector enterprises can be improved by improving the capital expenditure decision is accepted.

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CHAPTER - VIII

C H A P T E R VIII

RECOMMENDATIONS

Based on the analysis and conclusions given in the previous chapters, the following recommendations are made in this chapter for the improvement of capital expenditure practices in companies - especially in public sector companies.

8.1.0 Recommendations to improve capital expenditure decision.

- [1] There should be clear thinking and understanding during planning of capital expenditure.
- [2] Capital expenditure items proposed by the various department should not be a 'wish list', but it is to be practical and supported by facts and figures.
- [3] No muscle power of department head is to be used in getting the capital expenditure plan approved.
- [4] The request for financial approval should find proper answer to questions like;
 - [a] What is the need for this expenditure?

- [b] Why is it now?
- [c] How it will be done?
- [d] Who will be responsible?

[5] Detailed bar chart/PERT should follow every request for financial approval.

[6] The time of completion should be the time committed by the project team.

[7] Delay in all levels should be avoided to avoid further price rise.

[8] Liquidity damage clause should be included in all purchase orders.

[9] The review meeting should follow a proper agenda and man - bound and time - bound action plan. Action plans for follow up are to be very specifically mentioned and meticulously followed.

[10] All departments concerned like {i} Engineering [civil, mechanical, electrical and instrument], {ii} Materials [stores, purchase and traffic] and {iii} Accounts [material receipt, bill passing and cash] should have very close coordination.

8.2.0. The following ideal process chart developed for systematic preparation of capital expenditure, if followed will make the system more effective and meaningful.

Capital Expenditure is a process involving various activities. If the process can be defined, the implementation becomes easy and effective. The basic three steps in the preparation of capital expenditure are the following:-

1. Identification of capital expenditure projects
2. Preparation of Annual Capital Expenditure Plan
3. Preparation of Request for Financial Approval (RFA)

IDENTIFICATION OF CAPITAL EXPENDITURE PROJECTS

Exhibit 8.1 shows the various steps involved in identification of capital expenditure (CAPEX) projects. The need for a project may come either from the market demand or from the growth/improvement plan of the company. Projects coming from these two areas are to be revalidated with the strategic plan of the company. Another source from which a capital expenditure plan can emerge is the pain area of the company/plant. Ideas coming from these three areas can be converted into projects. A preliminary feasibility report for each project is to be prepared for understanding the project in depth. Projects coming out from here are to be considered for the annual capital expenditure plan of the company.

PREPARATION OF ANNUAL CAPITAL EXPENDITURE PLAN

Exhibit 8.2 shows the steps involved in the preparation of annual capital expenditure plan of the

EXHIBIT - 8.1

IDENTIFICATION OF PROJECTS
FOR CAPEX

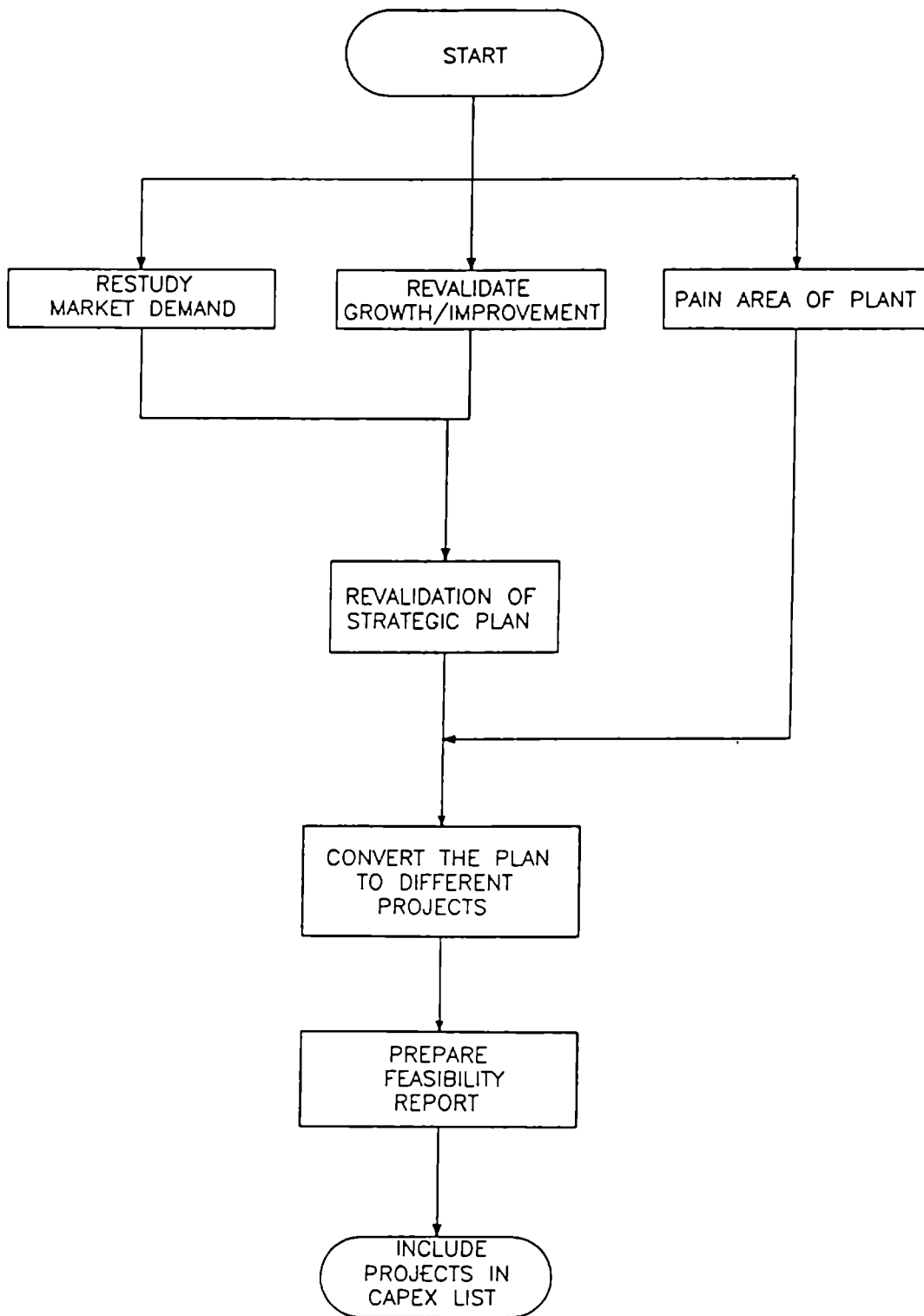
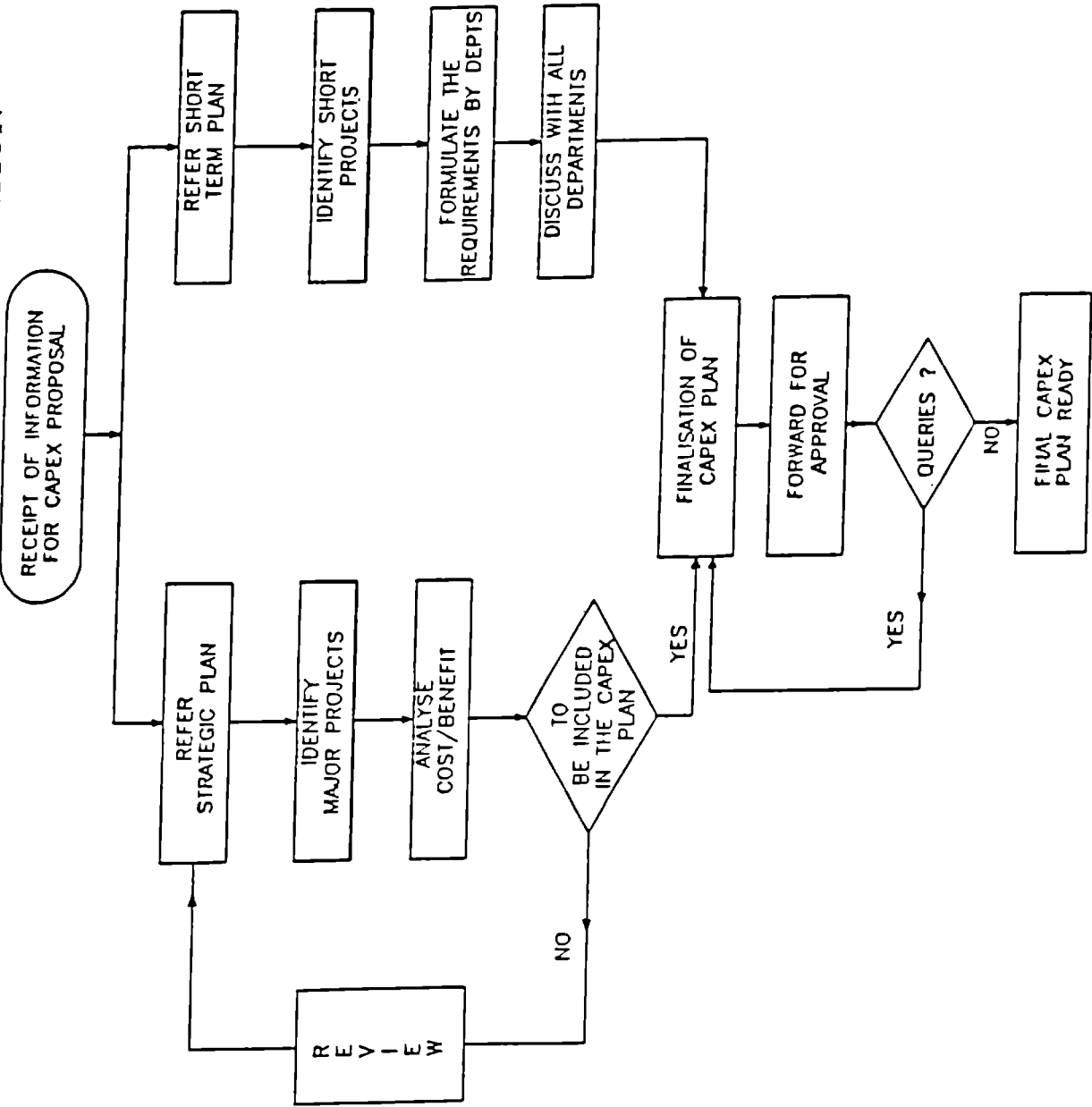


EXHIBIT-8.2
PROCESS OF CAPEX PREPARATION



company. This process normally follows the previous process of identification of projects. The identified projects of each department or section are referred to the strategic plan or short term plan of the company. Based on the strategic plan or short term plan, the projects can be identified as major projects or short/minor projects. For major projects cost benefit analysis is to be prepared. But in case of short/minor projects the various departments' requirement are to be formulated and discussed with all departments. The outcome of these discussions along with the major projects supported by the cost benefit analysis can be the final list of capital expenditure (CAPEX) plan of one particular plant. This can be forwarded to corporate office, if a separate corporate office exists, for the final capital expenditure plan approval by the chief engineer, chief finance officer and chairman and or managing director of the company, before the beginning of a financial year.

PREPARATION OF REQUEST FOR FINANCIAL APPROVAL

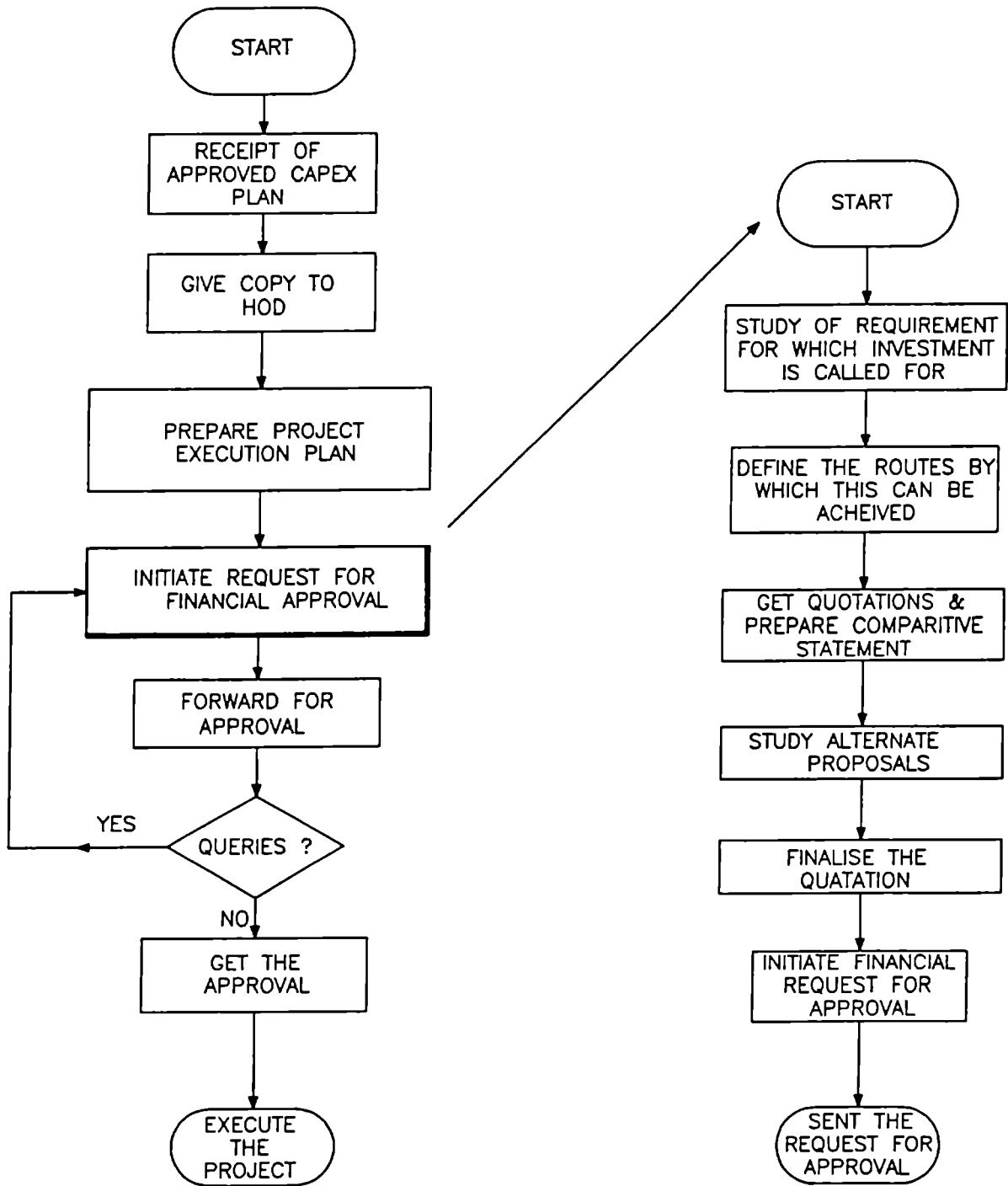
Once the annual capital expenditure plan is approved generally before the beginning of the financial year, a project execution plan is to be prepared. Project execution plan is the plan made at every plant clearly denoting who will execute which project and what is the time frame etc, Then the project leader has to prepare the request for financial approval.

Exhibit 8.3 shows the Macro process chart for the preparation of request for financial approval and also the Micro process chart giving the details of the request for financial approval.

The first step in the Micro process chart is to study the requirement for which investment is called for. The second step is to identify the alternatives or different routes available for meeting the requirement. Then quotations are to be invited for getting the material/equipment or for getting the job done. A comparative statement of different quotations are to be made. Once the comparative statement is studied by making use of capital expenditure evaluation methods the final source of supply and the course of action can be identified. After this is done the final request for approval showing details like what is this investment, why it is required, why it is required now, how it will be done, who will do it, what are the alternatives studied, what is the financial justification, what are the details of cost, what is the impact of this investment on environment etc., can be sent to the concerned authority depending upon the investment for approval. Once the request gets the approval the execution of the project can be started.

This type of clear identification and understanding of various steps involved in the preparation of capital expenditure proposal will avoid unnecessary queries from different angles and hence will avoid unnecessary delay in getting the proposal approved.

EXHIBIT - 8.3
PROCESS OF RFA PREPARATION



8.3.0. Review and / or reporting of the progress of capital expenditure is very important for the successful implementation. The bigger the report, lesser is the attention given by senior executives for reading and commenting. Therefore the reporting of the progress is to be done systematically. The following format is developed to improve the effectiveness of reporting of the progress of capital expenditure.

[a] The first chapter of the report should give an executive summary of the whole report.

[b] The second chapter is to be devoted for project control with subtitles like;

[i] Progress - to be given in few words but supported by progress chart which shows where the project stands now, where it should have been, where it will be in the next reporting time. Progress (S) chart which is also called as 'S' chart is a chart showing the relationship of time and job expressed as percentage.

[ii] Cost - here again overall cost chart is to be attached which will give a clear picture of cost planned and the actual cost incurred and the variance.

[iii] Changes - This is to include the description of any proposed and approved changes with clear mention about cost impact and time delay.

[iv] Procurement - materials and equipment are the live wire for any capital expenditure project. Procurement of these at the scheduled time, at the specified quality at reasonable price is very important. The time is important because if the materials/equipment are procured earlier, interest is lost till they are used. At the same time delay in getting the materials/equipment will definitely delay the project and hence will result in increase in cost. Therefore the actual status against the material planning is to be explained with the help of a chart.

[c] Safety - chance for injury or accident, and dangerous occurrence or hazardous incident is very high in project site. Therefore training on safety awareness is to be imparted to all those concerned in the capital expenditure projects. Personal protective equipments are to be properly used. Monitoring and recording of safety activities should find a place in reporting.

[d] Area of concern and corrective action - this section should give a correct picture about the concern and it should also give the proposed corrective action. The impact of these in cost and time is to be clearly mentioned.

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APPENDIX

A P P E N D I X - I A

QUESTIONNAIRE

A. You

- 1.1 Name of the company
- 1.2 Address of the company

- 1.3 Main products of the company
- 1.4 No. of branches/divisions, if any
- 1.5 Total number of employees
separately for branches/divisions
- 1.6 Paid up capital as on 31 March '93
- 1.7 Sales turnover
92-93
91-92
90-91
89-90
- 1.8 Net profit
92-93
91-92
90-91
89-90
- 1.9 Public sector enterprise/private
sector enterprise

B. Your Industry Group

- 2.1 Industry to which this company
belongs
Iron and steel
Non-ferrous

Paper and allied products
Engineering
Cement
Textiles
Tobacco
Sugar
Fertilizer
Coal mining
Petroleum products
Food and beverage
Chemicals
Pharmaceuticals
Soap and cosmetics
Tyre
Automobiles
Machine tools
Electric equipment
Consumer electronics
Any other

C. Your Capital Expenditure

3.1 Amount of capital expenditure planned

92-93:

91-92:

90-91:

89-90:

3.2 Amount of capital expenditure spent

92-93:

91-92:

90-91:

89-90:

3.3 Plans fore expansion and diversification

	Planned amount	Spent amount
92-93:		
91-92:		
90-91:		
89-90:		

3.4 Attach additional sheets showing list of capital expenditure items (more than Rs.50,000) along with planned date of completion, cost and saving against actual date of completion, cost and saving for each items for the period 92-93, 91-92, 90-91 and 89-90. Additional details like impact on environment by each project, pollution control techniques planned and achieved etc., can also be added.

3.5 Sources of fund

3.6 Cost of capital

3.7 Years of planning ahead for capital expenditure

[a] Routine

[b] Expansion/Diversification

3.8 Percent of new investment proposals for both routine and expansion/diversification originate at each of the following levels:-

Routine	Expansion/Diversif- ication
---------	--------------------------------

[a] Head Office

- [b] Divisional/ !
- Regional !
- Office !

- [c] Plant Office:
- [d] Any other

3.9 Percent of screening of new proposals at each of the following levels:-

- | | Routine | Expansion/Diversif-
ication |
|-------------------|---------|--------------------------------|
| [a] Head Office | | |
| [b] Divisional/ ! | | |
| Regional ! | | |
| Office ! | | |
| [c] Plant Office: | | |
| [d] Any other | | |

D..Your Organisation

- 4.1 Organisation set up for screening the proposals
- 4.2 Approval levels and their limits
- 4.3 Ranking of the capital expenditure evaluation techniques as is being practised in your organisation
 - [a] Payback method
 - [b] Accountant Rate of Return
 - [c] Discounted cash flow rate
 - [d] Net Present Value method
 - [e] M A P I
 - [f] Any other

4.4 Problems, if any, faced by the organisation in evaluating the proposals

4.5 Manuals or procedures for capital expenditure, if so relevant features

E. Your Team

5.1 Type of organisation for implementing the capital expenditure

5.2 Number of members of the implementing team and their freedom for decision making

5.3 Frequency for review meeting

5.4 Reporting system

F. Your Evaluation Methods

6.1 Type of O.R techniques used in assessing the progress of capital expenditure decisions

6.2 Frequency of progress evaluation

6.3 Comments about review

6.4 Sensitivity analysis

6.5 Risk analysis

- [a] Methods employed
- [b] Results

6.6 Post Audit

6.7 The extent of expected returns as achieved in the past projects including the life

G..Your Comments

7.1 The weakness of your system

7.2 Proposed ranking of the capital expenditure evaluation techniques

- [a] Payback method
- [b] Accountant Rate of Return
- [c] Discounted cash flow rate
- [d] Net Present Value method
- [e] M A P I
- [f] Any other

7.3 Suggestion for improvement

7.4 General comments

H..Approval

8.1 Name of the Chief Financial Officer of the company

8.2 Name of the Chief Engineer
of the company

8.3 Name of the Chief Project
Manager of the company

8.4 Approval of this questionnaire
with date

I..About I

9.1 Name E.C.JOSE

9.2 Occupation Materials Superintendent
Indian Aluminium Company Ltd,

9.3 Address A-1, IAC Staff Quarters
Indian Aluminium Company Ltd.,
P.O.Kuttikattukara
Ernakulam - 683 504

9.4 Purpose As a research student of
Schoool of Management
Studies, Cochin
University of Science and
Technology,
Cochin - 682 022.

T H A N K Y O U

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APPENDIX - I B

The following is the schedule used to collect data during discussion with senior executives of various companies.

SCHEDULE

- [01] How much is the increase in cost in capital expenditure during the last five year in your company?
- [02] How much is the delay in implementation of capital expenditure projects?
- [03] What are the reasons for delay and how much each reason is contributing?
- [04] What is the return on expected gain of capital expenditure projects in your company?
- [05] What is the efficiency of project evaluation?
- [06] How much is the effectiveness of feasibility of detailed financial report?
- [07] What is the effectiveness of project planning and scheduling?
- [08] What is the effectiveness of project monitoring?

[09] What is the effectiveness of negotiation for capital expenditure projects?

[10] How much is the use of computerised project management technique in capital expenditure projects?

[11] Are you using network technique in capital expenditure project? If so, how much?

[12] Any other information relevant to capital expenditure.

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BIBLIOGRAPHY

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