



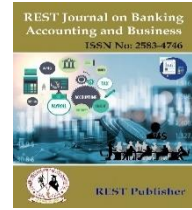
**REST Journal on Banking, Accounting and Business**

**Vol: 2(2), June 2024**

**REST Publisher; ISSN: 2583-9721**

**Website: <https://restpublisher.com/journals/jbab/>**

**DOI: <https://doi.org/10.46632/jbab/3/2/12>**



# **A Study on Capital Budgeting Evaluation Methods & Techniques with Reference to Heritage Food India Ltd Hyderabad**

**Busareddypally Sai Kumar, Jyothika Sony**

*Aristotle PG College, Hyderabad, Telangana, India.*

Corresponding Author Email: [chakalimithisha@gmail.com](mailto:chakalimithisha@gmail.com)

**Abstract:** *Capital budgeting is the process of evaluating and selecting long-term investments that are consistent with the goal of the firm. Capital expenditure decision affects the company's future cost structure over a long-time span. The investment in fixed assets increases the fixed cost of the firm, which must be recovered from the benefit of the same project. If the investment turns out to be unsuccessful in future or gives less profit than expected, the company will have to bear the extra burden of fixed costs. Such risk can be minimized through the systematic analysis of projects, which is an integral part of investment decisions. Capital investment decisions are not easily reversible without much financial loss to the firm because there may be no market for second-hand plants and equipment and their conversion to other uses may not be financially viable. Hence, capital investment decisions are to be carried out and performed carefully and effectively in order to save the company from such financial loss. The investment decision which is undertaken carefully and effectively can save the firm from huge financial loss aroused due to the selection of unfavorable projects.*

**Keywords:** *capital Budgeting, capital expenditure, capital investment, investment decisions.*

## **1. INTRODUCTION**

While making capital budgeting investment decision the following factors or aspects should be considered.

- The amount of investment
- Minimum rate of return on investment (k)
- Return expected from the investments. (R)
- Ranking of the investment proposals and
- Based on profitability the raking is evaluated I.e., expected rate of return on investment.

## **2. REVIEW OF LITERATURE**

**Susan F. Haka** This chapter provides a historical appraisal of the development of current capital budgeting practices and reviews capital budgeting academic research. In the late eighteenth and early nineteenth centuries, the industrial revolution was instrumental in creating demand for capital budgeting processes and techniques. Academic research, beginning in the late 1940s and early 1950s, is categorized by its focus on appraisal techniques, individual decision-maker effects, organizational issues, and environmental factors. Experimental, analytical, agency-based, survey-based, and case-based research is reviewed. The chapter concludes with a compilation of issues identified by academic research and a set of questions that have not yet been addressed.

### **Objectives of the study**

1. To determine the capital projects those are feasible.
2. To estimate the expenditure involved.
3. To ensure the selection of the possible profitable capital project.
4. To ensure maximization of profits by allocating the available investment.

### **Research methodology:**

Methodology is a systematic procedure of collecting information in order to analyze and verify a phenomenon. The collection of information is done two principles sources.

**They are as follows:**

1. Primary Data
2. Secondary Data

**Primary Data:**

It is the information collected directly without any references. In this study it is gathered through interviews with concerned officers and staff, either individually or collectively, sum of the information has been verified or supplemented with personal observation conducting personal interviews with the concerned officers of finance department of Heritage.

**Secondary Data:**

The secondary data was collected from already published sources such as, pamphlets of annual reports, returns and internal records, reference from text books and journals relating to financial management.

**The data collection includes.**

- (a) Collection of required data from annual records of Heritage.
- (b) Reference from text books and journals relating to financial management.

**Limitations of the study:**

1. Lack of awareness of food generation sector of heritage
2. Lack of time is another limiting factor the scheduled period 5 weeks are not sufficient to make the study independently regarding Capital budgeting in Heritage Ltd.
3. The busy schedule of the officials in Heritage Ltd is another limiting factor. Due to the busy schedule of officials restricted me to collect the complete information about the organization.
4. Non-availability of confidential financial data.
5. The study was conducted in a short period, which was not detailed in all aspects.

### 3. DATA ANALYSIS & INTERPRETATION

**TABLE 1.** Statement showing calculation of payback period

YEAR	ROE	INC	TAX	PAT	DEP	CFAT	CCFAT
1	59.64	5.48	0	65.12	170.4	235.52	235.52
2	59.64	5.48	0	65.12	170.4	235.52	471.04
3	59.64	5.48	0	65.12	170.4	235.52	706.56
4	59.64	5.48	0	65.12	170.4	235.52	942.08
5	59.64	5.48	0	65.12	170.4	235.52	1177.6
6	59.64	5.48	0	65.12	170.4	235.52	1413.12
7	59.64	5.48	0	65.12	170.4	235.52	1648.64
8	59.64	5.48	0	65.12	170.4	235.52	1884.16
9	59.64	5.48	0	65.12	170.4	235.52	2119.68
10	59.64	5.48	0	65.12	170.4	235.52	2355.2
11	59.64	5.48	22.8	42.32	14.2	56.52	2411.72
12	59.64	5.48	22.8	42.32	14.2	56.52	2468.24
13	59.64	5.48	22.8	42.32	14.2	56.52	2524.76
14	59.64	5.48	22.8	42.32	14.2	56.52	2581.28
15	59.64	5.48	22.8	42.32	14.2	56.52	2637.8
16	59.64	5.48	22.8	42.32	14.2	56.52	2694.32
17	59.64	5.48	22.8	42.32	14.2	56.52	2750.84
18	59.64	5.48	22.8	42.32	14.2	56.52	2807.36
19	59.64	5.48	22.8	42.32	14.2	56.52	2863.88
20	59.64	5.48	22.8	42.32	14.2	56.52	2920.4

21	59.64	5.48	22.8	42.32	14.2	56.52	2976.92
22	59.64	5.48	22.8	42.32	14.2	56.52	3033.44
23	59.64	5.48	22.8	42.32	14.2	56.52	3089.96
24	59.64	5.48	22.8	42.32	14.2	56.52	3146.48
25	59.64	5.48	22.8	42.32	14.2	56.52	3203

Base Year = 9<sup>th</sup> year  
 Required CFAT = 10.32  
 Next year CFAT = 2355.2

$$\text{Payback period} = 9^{\text{th}} \text{ year} + \frac{2130 - 2119.68}{2355.2} = 9^{\text{th}} \text{ year} + .00437\text{yr}$$

$$= \mathbf{9.004 \text{ years.}}$$

**Interpretation:**

As per payback period, the project is accepted because to get the initial investment of 2130 crores, it is taking a time of 9.004 year.

**Average Rate of Return:**

The Average Rate of Return (ARR) is also known as Accounting Rate of Return using accounting information, as revealed by financial statements, to measure the profitability of an investment. The accounting rate of return is found out by dividing the average after-tax profit by the average investment. The average investment would be equal to half of the original investment, if it is depreciated constantly.

$$\text{A.R.R.} = \frac{\text{Annual Average Profit after Tax}}{\text{Annual Average Investment}} \times 100$$

**TABLE 2.** Statement showing calculation of average rate of return

YEAR	ROE	INC	TAX	PAT
1	59.64	5.48	0	65.12
2	59.64	5.48	0	65.12
3	59.64	5.48	0	65.12
4	59.64	5.48	0	65.12
5	59.64	5.48	0	65.12
6	59.64	5.48	0	65.12
7	59.64	5.48	0	65.12
8	59.64	5.48	0	65.12
9	59.64	5.48	0	65.12
10	59.64	5.48	0	65.12
11	59.64	5.48	22.8	42.32
12	59.64	5.48	22.8	42.32
13	59.64	5.48	22.8	42.32
14	59.64	5.48	22.8	42.32
15	59.64	5.48	22.8	42.32
16	59.64	5.48	22.8	42.32
17	59.64	5.48	22.8	42.32
18	59.64	5.48	22.8	42.32
19	59.64	5.48	22.8	42.32
20	59.64	5.48	22.8	42.32
21	59.64	5.48	22.8	42.32

22	59.64	5.48	22.8	42.32
23	59.64	5.48	22.8	42.32
24	59.64	5.48	22.8	42.32
25	59.64	5.48	22.8	42.32
Total				1286

**Calculation of ARR:**

Average NPAT = 1286/25 = 51.44

Average Investment = 2130/2 = 1065

$$\text{ARR} = \frac{51.44}{1065} \times 100 = 4.83 \%$$

**Interpretation:**

From the point of ARR method, project should be accepted, as its ARR is less than the required rate return (4.83% < 12%).

**Net Present Value:**

The Net present value (NPV) method is the classic economic method of evaluating investment proposals. It is one of the discounted cash flow techniques explicitly recognizing the time value of money. It correctly postulates that cash flows arising at different time periods differ in value and the comparable only when their equivalents present values are found out.

**TABLE 3.** Statement showing calculation of net present value

YR	ROE	INC	TAX	PAT	DEP	CFAT	PV@	PV	CASH	PV OF
							12%	CFAT	O.F	COF
0							1		426	426
1	59.64	5.48	0	65.12	170.4	235.52	0.893	210.32	170.4	152.17
2	59.64	5.48	0	65.12	170.4	235.52	0.797	187.71	170.4	135.81
3	59.64	5.48	0	65.12	170.4	235.52	0.712	167.69	170.4	121.32
4	59.64	5.48	0	65.12	170.4	235.52	0.636	149.79	170.4	108.37
5	59.64	5.48	0	65.12	170.4	235.52	0.567	133.54	170.4	96.62
6	59.64	5.48	0	65.12	170.4	235.52	0.507	119.41	170.4	86.39
7	59.64	5.48	0	65.12	170.4	235.52	0.452	106.46	170.4	77.02
8	59.64	5.48	0	65.12	170.4	235.52	0.404	95.15	170.4	68.84
9	59.64	5.48	0	65.12	170.4	235.52	0.361	85.02	170.4	61.51
10	59.64	5.48	0	65.12	170.4	235.52	0.322	75.84	170.4	54.87
11	59.64	5.48	22.8	42.32	14.2	56.52	0.287	16.22	0	0
12	59.64	5.48	22.8	42.32	14.2	56.52	0.257	14.53	0	0
13	59.64	5.48	22.8	42.32	14.2	56.52	0.229	12.94	0	0
14	59.64	5.48	22.8	42.32	14.2	56.52	0.205	11.59	0	0
15	59.64	5.48	22.8	42.32	14.2	56.52	0.183	10.34	0	0
16	59.64	5.48	22.8	42.32	14.2	56.52	0.163	9.21	0	0
17	59.64	5.48	22.8	42.32	14.2	56.52	0.146	8.25	0	0
18	59.64	5.48	22.8	42.32	14.2	56.52	0.13	7.35	0	0
19	59.64	5.48	22.8	42.32	14.2	56.52	0.116	6.56	0	0
20	59.64	5.48	22.8	42.32	14.2	56.52	0.104	5.88	0	0

21	59.64	5.48	22.8	42.32	14.2	56.52	0.093	5.26	0	0
22	59.64	5.48	22.8	42.32	14.2	56.52	0.083	4.69	0	0
23	59.64	5.48	22.8	42.32	14.2	56.52	0.074	4.18	0	0
24	59.64	5.48	22.8	42.32	14.2	56.52	0.066	3.73	0	0
25	59.64	5.48	22.8	42.32	14.2	56.52	0.059	3.33	0	0
	1491	137	342	1286	1917	3203		1454.99		1388.92

Present value of cash inflow = **1454.99**

Present value of cash outflow = 1388.92

Net Present Value = 1454.99 – 1388.92 = **66.07 crores**

**Interpretation:**

As NPV is positive, the project is accepted.

**Profitability Index:**

It is also called Benefit Cost Ratio. It is also a time-adjusted method of evaluating the investing proposals. It is the relationship between the present value of cash inflows and the present value of cash outflows.

**TABLE 4.** Statement showing calculation of profitability index

YR	ROE	INC	TAX	PAT	DEP	CFAT	PV@	PV	CASH	PV OF
							12%	CFAT	O.F	COF
0							1		426	426
1	59.64	5.48	0	65.12	170.4	235.52	0.893	210.32	170.4	152.17
2	59.64	5.48	0	65.12	170.4	235.52	0.797	187.71	170.4	135.81
3	59.64	5.48	0	65.12	170.4	235.52	0.712	167.69	170.4	121.32
4	59.64	5.48	0	65.12	170.4	235.52	0.636	149.79	170.4	108.37
5	59.64	5.48	0	65.12	170.4	235.52	0.567	133.54	170.4	96.62
6	59.64	5.48	0	65.12	170.4	235.52	0.507	119.41	170.4	86.39
7	59.64	5.48	0	65.12	170.4	235.52	0.452	106.46	170.4	77.02
8	59.64	5.48	0	65.12	170.4	235.52	0.404	95.15	170.4	68.84
9	59.64	5.48	0	65.12	170.4	235.52	0.361	85.02	170.4	61.51
10	59.64	5.48	0	65.12	170.4	235.52	0.322	75.84	170.4	54.87
11	59.64	5.48	22.8	42.32	14.2	56.52	0.287	16.22	0	0
12	59.64	5.48	22.8	42.32	14.2	56.52	0.257	14.53	0	0
13	59.64	5.48	22.8	42.32	14.2	56.52	0.229	12.94	0	0
14	59.64	5.48	22.8	42.32	14.2	56.52	0.205	11.59	0	0
15	59.64	5.48	22.8	42.32	14.2	56.52	0.183	10.34	0	0
16	59.64	5.48	22.8	42.32	14.2	56.52	0.163	9.21	0	0
17	59.64	5.48	22.8	42.32	14.2	56.52	0.146	8.25	0	0
18	59.64	5.48	22.8	42.32	14.2	56.52	0.13	7.35	0	0
19	59.64	5.48	22.8	42.32	14.2	56.52	0.116	6.56	0	0
20	59.64	5.48	22.8	42.32	14.2	56.52	0.104	5.88	0	0
21	59.64	5.48	22.8	42.32	14.2	56.52	0.093	5.26	0	0
22	59.64	5.48	22.8	42.32	14.2	56.52	0.083	4.69	0	0
23	59.64	5.48	22.8	42.32	14.2	56.52	0.074	4.18	0	0
24	59.64	5.48	22.8	42.32	14.2	56.52	0.066	3.73	0	0
25	59.64	5.48	22.8	42.32	14.2	56.52	0.059	3.33	0	0

	1491	137	342	1286	1917	3203		1454.99		1388.92
--	------	-----	-----	------	------	------	--	---------	--	---------

$$\text{Profitability Index} = \frac{\text{PV of cash inflows}}{\text{PV of cash out flows}}$$

$$\text{Net Profitability Index} = \frac{\text{NPV}}{\text{Initial cash outlay}}$$

From the above table calculated values are

Present value of cash inflow = 1454.99  
 Present value of cash outflow = 1388.92

$$\begin{aligned} \text{Profitability Index} &= \frac{1454.99}{1388.92} \\ &= 1.047 \end{aligned}$$

$$\begin{aligned} \text{Net Profitability Index} &= \frac{6.07}{1388.92} \\ &= \mathbf{0.047} \end{aligned}$$

**Interpretation:**

1. As the ruled (PI) profitability index we can accept only the projects having the (>1) value.
2. The result we got (1.047) is positive indication.
3. The net profitability index lies between the 0.47 it seems the project affianced sure returns.

**Internal Rate of Return:**

The internal rate of return (IRR) method is another discounted cash flow technique, which makes account of the magnitude and timing of cash flows. Others terms used to describe the IRR Method are yield on investment, marginal efficiency of capital, rate of return over cost, time adjusted rate of internal return and so on. The concept of internal rate of return is quite simple to understand in the case of one-period projects. The IRR is calculated by interpolating the two rates with the help of the following formula:

$$\text{IRR} = \text{LR} + \frac{\text{Pv of cash inflows at lower rate} - \text{Pv of cash outflows}}{\text{Pv of cash inflows at lower rate} - \text{Pv of cash inflows at higher rate}} (\text{hr}-\text{lr})$$

where,

- Lr = Rate of interest that is lower of the two rates at which PV of Cash inflows have been Calculated.
- Hr= Rate of interest that is higher of the two rates at which PV of Cash inflows have been Calculated.

**Acceptance Rule:**

The accept project rule, using the IRR method, is to accept the project if its internal rate of return is higher than the opportunity cost of capital (r>k) note that k is also known as the required rate of return or cut-off rate. The project shall be rejected if its internal rate of return is lower than the opportunity cost of capital. Thus the IRR acceptance rules are:

- ✓ Accept if r>k
- ✓ Reject if r<k
- ✓ May accept if r=k

**TABLE 5.** Statement showing the calculations of internal rate of return

YR	ROE	INC	TAX	PAT	DEP	CFAT	PV @	PV OF	PV @	PV OF
							12%	CF	13%	CF
1	59.64	5.48	0	65.12	170.4	235.52	0.893	210.32	0.885	208.44
2	59.64	5.48	0	65.12	170.4	235.52	0.797	187.71	0.783	184.41
3	59.64	5.48	0	65.12	170.4	235.52	0.712	167.69	0.693	163.22
4	59.64	5.48	0	65.12	170.4	235.52	0.636	149.79	0.613	144.37
5	59.64	5.48	0	65.12	170.4	235.52	0.567	133.54	0.543	127.89
6	59.64	5.48	0	65.12	170.4	235.52	0.507	119.41	0.48	113.05
7	59.64	5.48	0	65.12	170.4	235.52	0.452	106.46	0.425	100.1
8	59.64	5.48	0	65.12	170.4	235.52	0.404	95.15	0.376	88.56
9	59.64	5.48	0	65.12	170.4	235.52	0.361	85.02	0.333	78.43
10	59.64	5.48	0	65.12	170.4	235.52	0.322	75.84	0.295	69.48
11	59.64	5.48	22.8	42.32	14.2	56.52	0.287	16.22	0.261	14.75
12	59.64	5.48	22.8	42.32	14.2	56.52	0.257	14.53	0.231	13.06
13	59.64	5.48	22.8	42.32	14.2	56.52	0.229	12.94	0.204	11.53
14	59.64	5.48	22.8	42.32	14.2	56.52	0.205	11.59	0.181	10.23
15	59.64	5.48	22.8	42.32	14.2	56.52	0.183	10.34	0.16	9.04
16	59.64	5.48	22.8	42.32	14.2	56.52	0.163	9.21	0.141	7.97
17	59.64	5.48	22.8	42.32	14.2	56.52	0.146	8.25	0.125	7.07
18	59.64	5.48	22.8	42.32	14.2	56.52	0.13	7.35	0.111	6.27
19	59.64	5.48	22.8	42.32	14.2	56.52	0.116	6.56	0.098	5.54
20	59.64	5.48	22.8	42.32	14.2	56.52	0.104	5.88	0.087	4.92
21	59.64	5.48	22.8	42.32	14.2	56.52	0.093	5.26	0.077	4.35
22	59.64	5.48	22.8	42.32	14.2	56.52	0.083	4.69	0.068	3.84
23	59.64	5.48	22.8	42.32	14.2	56.52	0.074	4.18	0.06	3.39
24	59.64	5.48	22.8	42.32	14.2	56.52	0.066	3.73	0.053	3
25	59.64	5.48	22.8	42.32	14.2	56.52	0.059	3.33	0.047	2.66
	1491	137	342	1286	1917	3203		1454.98		1385.55

$$\begin{aligned}
 \text{Therefore, IRR} &= LR + \frac{PV @ LR - COF}{PV @ LR - PV @ HR} \times \text{Rate Difference} \\
 &= 12\% + \frac{1454.98 - 1388.92}{1454.98 - 1385.55} \times 1 \\
 &= 12\% + \frac{66.06}{69.43} \times 1 = 12\% + 0.95\% = 12.95\%
 \end{aligned}$$

**Interpretation:**

Therefore, IRR lies at 12.95%. It is a point where outflow = inflow And IRR>K, Therefore it is accepted.

$$\text{ROE} = 426 \times 14\% = 59.64$$

$$\begin{aligned} \text{Incentive} &= \text{Difference of Standard capacity - Actual capacity} \times 0.25 \text{ Pisa} \\ \text{Standard capacity} &= \frac{\text{Installed capacity} \times \text{Hours} \times \text{No. Of days in a Year}}{1000} \times \text{Std \%} \\ &= \frac{500 \text{ MW} \times 24 \times 365}{1000} \times 85 \% = 3723 \\ \text{Actual capacity} &= \frac{\text{Installed capacity} \times \text{Hours} \times \text{No. of days in a Year}}{1000} \times \text{Std \%} \\ &= \frac{500 \text{ MW} \times 24 \times 365}{1000} \times 80 \% = 3504 \end{aligned}$$

Therefore,

$$\text{Incentive} = 3723 - 3504 \times 0.25 = 54.75/10 = 5.48$$

Depreciation = 80% of CC = 1704

Which is paid in 10 equal installments = 1704 / 10 = 170.4

And balance 10% = 213 which is paid in 15 equal installments = 213 / 15 = 14

Tax = 35 % of ROE + incentive = 22.8

Note: For the first 10 years tax holiday

### Findings:

- The net present value of Heritage is satisfactory.
- The internal rate of return of Heritage is considerably high.
- The heritage will take long period to recover the initial investment.
- The profitability index is to meet company objectives.
- The average rate of return is very low because the motto is not to earn profits. This is compensated for by good benefits to society.
- As discussed in earlier chapter Heritage follows, systems and procedures as per the Andhra Pradesh State Electricity Act, accordingly project initiative is taken up.
- While preparing project financing Heritage considers social benefit of the state.
- Heritage generates the food based on requirement of APTRANSCO.
- The project's life is expected to be 25 years; due to this the gestation period is very high.
- The entire project is financed by the food financial institutions like (PFC, REC).
- The major portion of finance is done through secured loans.
- The unit cost and other expenditures are eligible to be claimed from the potential buyer as approved by the Regulatory Commission.

### Suggestions

- The company should go for the improvement in the technology to improve efficiency and to decrease the cost of production per unit.
- For societies with lower income levels or below the poverty line, company should go for subscribed rates and for industries it should increase its rate marginally to cover the losses.
- The subscribed cost in future should be reduced.
- High risk is associated with the project, since the generation period is high.
- The government of AP should provide notional debt equity.



#### 4. CONCLUSIONS

The budgeting exercise in Heritage also covers the long-term capital budgets, including annual planning and provides long term plans for application of internal resources and debt servicing translated into the corporate plan. The scope of capital budgeting also includes expenditure on plant betterment, and renovation, balancing equipment, capital additions and commissioning expenses on trial runs generating units. To establish a close link between physical progress and monetary outlay and to provide the basis for plan allocation and budgetary support by the government. The manual recommends the computation of NPV at a cost of capital / discount rate specified from time to time. A single discount rate should not be used for all the capacity budgeting projects. The analysis of relevant facts and quantifications of anticipated results and benefits, risk factors if any, must be clearly brought out. Inducting at least three non -official directors, the mechanism of the Search Committee should restructure the Boards of these PSUs. A feasibility report of the project is prepared on the cost estimates and the cost of generation. Scope of capital budgeting in NTPC are Approved and ongoing schemes are new approved schemes, unapproved schemes, capital budgets for plant betterment's, survey and investigation.

#### REFERENCES

- [1]. Welch, I. (2015) Corporate finance: An introduction (5th ed.). Pearson Education International.
- [2]. Williamson, R., & Yang J. (2013). Financial constraints, firm structure and acquisitions. Working Paper, Georgetown University.
- [3]. Zhang, G. (1997). Moral Hazard in Corporate Investment and the Disciplinary Role of Voluntary Capital Rationing. *Management Science*, 43, 737-750. <https://doi.org/10.1287/mnsc.43.6.737>