



Methodology for performing a financial/economic feasibility analysis

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What Project Appraisal examines?

- **Technical Feasibility**
 - suitability of the technology selected
 - adequacy of the technical investigation, and design.
- **Economic Feasibility**
 - determines the conduciveness of economic parameters to setting up the project and their impact on the scale of operations. It also contains Market Demand/Survey providing rationale for undertaking the Project.
- **Financial Feasibility**
 - Determines the accuracy of cost estimates, suitability of the envisaged pattern of financing and general soundness of the capital structure.
- **Commercial Viability**
 - Ascertains the extent of profitability of the project and its sufficiency in relation to the repayment obligations pertaining to term finance.
- **Managerial Competency**
 - Ascertain that competency exists in the project to ensure its successful implementation and efficient management after commencement of commercial production.

We have to understand whether the project is acceptable

- The first step in Project Appraisal is to find out whether the project is prima facie acceptable by examining salient features such as:
 - The background and experience of the applicants, particularly in the proposed line of activity
 - The potential demand for the product
 - The availability of the required inputs, utilities and other infrastructural facilities
 - Whether the project is in keeping with the priorities, if any, laid down by the Government.

Project Appraisal: you need to collect information! (I/II)

- Project Appraisal should contain the following essential information, such as:
 - **Particulars of the project** along with a copy of the **Project Feasibility Report** furnishing details of the technology, manufacturing process, availability of construction / production facilities, etc.
 - Estimates of **Cost of the project** detailing the itemized assets acquired / to be acquired, inclusive of Preliminary / Pre-operative Expenses and WC margin requirements.
 - Details of the **proposed means of financing** indicating the extent of promoters' contribution, the quantum of Share Capital to be raised by public issue, the composition of the borrowed capital portion with particulars of Term Loans, Foreign Currency Loans, etc.
 - **WC requirements** at the peak level (i.e., when the level of Gross Current Assets is at the peak) during the first year of operations after the commencement of commercial production and the banking arrangements to be made for financing the WC requirements.
 - **Project Implementation Schedule** review in the light of actual implementation; Main stages in the project implementation and whether the time schedule for construction, erection/installation of P&M, start-up/trial run, commencement of commercial production is reasonable & acceptable



Project Appraisal: you need to collect information! (II/II)

- **Organizational set up** along with a list of Board of Directors and indicating the qualifications, experience and competence of
 - i) The **key personnel** to be in charge of implementation of the project during the construction period and
 - ii) The **executives** to be in charge of the functional areas of purchase, production, marketing and finance after commencement of commercial production.
- **Demand projection** based on the overall market prospects together with a copy of the market survey report.
- Details of the nature and value of the **securities offered**.
- **Regulatory Consents** from the Government / other authorities and any other relevant information.
- Interactive Financial Model Containing detailed Projections with assumptions including following at a minimum
 - **Estimates of sales**, CoP and profitability.
 - **Projected P&L Account and Balance Sheet** for the operating years during the currency of the Bank's term assistance.
 - **Proposed amortization schedule**, i.e., repayment program.
 - **Projected Funds Flow Statement** covering both the construction period and the subsequent operating years during the currency of the Term Loan.

What is a Feasibility Study?

- As one of the first steps in a project financing is hiring of a technical consultant and he will prepare a feasibility study showing the financial viability of the project
- A prospective lender may hire its own independent consultants to Prepare or Review the Feasibility Study before the lender will commit to lend funds for the project.

Contents

- Description of project
- Description of sponsor(s)
- Sponsors' Agreements.
- Project site.
- Governmental arrangements.
- Source of funds.
- Feedstock Agreements.
- Off take Agreements.
- Construction Contract.
- Management of project.
- Capital costs.
- Working capital.
- Equity sourcing.
- Debt sourcing.
- Financial projections.
- Market study.
- Assumptions.

What do we check in a Project Appraisal?

• TECHNICAL FEASIBILITY

- The main objective of a technical feasibility study is to determine whether a certain plan of action is feasible—that is, will it work?
- A technical feasibility assessment should be applied to all projects being considered in order to better understand if the project can be done “technically” and whether it can be done “here and now”
- **Technology and techniques:**
 - Do the technology and techniques required to deliver this project exist locally or globally? Have they been used before? If a new technology or technique is needed, how confident are we in its success?
- **Technical capacity/skills:**
 - Do the skills exist locally to design and implement the project? Have they been used before?
- **Human and Financial resources:**
 - What is the scope of human and financial (budget) resources required to implement this project? Will the human resources be accessible, and how might costs change during the life of the project (operational, maintenance, etc.)?

Financial feasibility checks: (1)

- Determines the accuracy of cost estimates, suitability of the envisaged pattern of financing and general soundness of the capital structure.
- Understands the Total Cost of Project *Financial feasibility checks: (including Contingency & appropriate risk mitigation)
- Determines whether a Project is Financially Feasible—that is, will it provide adequate returns to all investors (including Debt Holders) based on reasonable Assumptions.

Financial feasibility checks: (2)

PAST TRACK RECORD

- Summary of Sponsor Company's past performance
 - Licensed/installed/operating capacities,
 - Sales,
 - Operating / Net Profit
 - Capacity utilization;
 - Dividend policy
 - Capital expenditure programs
 - Sources of financing;
 - Company's management-labour relations

PRESENT FINANCIAL POSITION

- Sponsor Company's audited Balance Sheets & P/L Accounts for the past 3 years with analysis; Company's Capital structure; Summaries conclusions of financial analysis; Method of depreciation; Revaluation of F/A; Record of major defaults; Position of Company's tax assessment; contingent Liabilities; Pending suits; Qualifications /Adverse remarks by auditors

PROJECT INCENTIVE

- Support from Government
- Hedging for any open exchange or interest rate risk (FOREX)
- Security package that is enforceable
- Experienced and capable contractor(s)
- Experienced and capable operator(s)

- Mitigation of key risks (e.g. technological, environmental)

Financial feasibility checks: (3)

- **WORKING CAPITAL REQUIREMENTS**

- Assessment of total WC requirements (at the peak level during the first year of operations or after commencement of commercial production)
- Sharing of business among member banks
- Financing of additional WC requirements in case of existing companies.

- **MARKETING**

- Sales prospects and underlying assumptions,
- Demand projections on the basis of past consumption, total supply position, general condition of industry
- Selling Price-Trend to see whether stable, Govt. price controls ,quota systems, etc
- Prospects for exports – Export obligations;
- Marketing Organization – Adequacy, Distributors/Selling Agents, Terms of arrangement, remuneration, competence, Concerns – Siphoning of profits

- **FUNDS FLOW ANALYSIS**

- Funds Flows to be divided into Long term Funds Flows and Short Term Funds Flows
- Difference would indicate Long Term Surplus or Deficit/Movements in C/A &Op. Cash Flow leading to increase or decrease in WC, Essential expenditure on F/A, repayment obligations, taxes and dividends are fully provided for; Cash generation would be adequate to meet all commitments during the entire repayment period.

Financial feasibility checks: (4)

PROJECTED BALANCE SHEETS

- Projected B/S covering the entire period of repayment to be scrutinized;
- Profitability estimates, Funds Flow projections and projected B/S are all inter-related
- Projected B/S to be scrutinized analytically with reference to all other related essential data to ensure that all the projections, made realistically and accurately, have been woven into well coordinated financial statements.
- Focus on underlying Assumptions

SECURITY & MARGIN AND RATE OF INTEREST

- Complete details of (backup) security to be offered for the Term Loan
- Detailed Opinion Report on Guarantors
- Security Margin Coverage Ratio
- Whether security offered and the margin available are adequate and satisfactory
- Credit Rating may be done and interest rate (Pricing) to be in line with this rating, unless market forces demand otherwise

Financial feasibility checks: (5)

- **GOVERNMENT CONSENTS AND INCENTIVES**

- Examples include

- Concession Agreement and/or Industrial License
- Approval for collaboration agreement and technical know-how arrangement
- Clearance for import of Machinery
- Approval for making payments for imported Machinery on deferred terms and specific clearance for tax exemption on interest
- Consent from Controller of Capital issues (f) Various approvals /No Objection Certificate from Local Authorities, etc

- **GROUP COMPANIES**

- Brief resume of Group Companies indicating the extent to which they are depend on the parent company/other companies in the Group
- Company's liability in respect of partly paid shares in subsidiary companies

Financial feasibility checks: (6)

• MANAGERIAL COMPETENCY

- Company's management set-up;
- Composition of the BoD;
- CEO in charge of day-to day affairs of the Company;
- Quality of the Company's management and the level of managerial expertise built-up within the Group;
- Whether all departments are well served by professionals

FINANCIAL EVALUATION

- Acceptable Gearing Levels
- Adequate Debt Service Coverage Ratio
 - DSCR provides the value in terms of the number of times the total debt service obligations consisting of interest and repayment of principal in installments are covered by the operating funds available after the payment of tax: earnings after taxes, EAT + interest + Depreciation + Other non cash expenditure like amortization.
 - Gives an indication of Margin of safety and extent of risk coverage
 - DSCR is considered a comprehensive and apt measure to compute debt service capacity of Project.
 - $DSCR = \frac{EAT + \text{interest} + \text{Depreciation} + \text{Other Non cash expenditure}}{\text{Installments (Interest + Principal)}}$
- Internal Rate of Return
 - Indicate the IRR for the project and should be compare with the IRR's for similar projects in the same industry

FINANCIAL EVALUATION

- Break-Even Analysis & and comparison with projected capacity utilization
- Sensitivity Analysis – To determine ‘Resiliency’ of the project
- Net Cash Flow: Net Income plus Non Cash Expenses (Depreciation, Amortization etc)
- Inter-firm comparisons
- Repayment Schedule based on the above factors and initial moratorium (start-up) period

FINANCIAL EVALUATION TECHNIQUES

Some common techniques of evaluating viability of infrastructure projects are given below:

- Pay-Back Period Method
- Accounting Rate of Return Method
- NPV (Net Present Value) Method
- Profitability Index Method
- IRR (Internal Rate of Return) Method

Pay-Back Period Method

The Pay-Back Period is the length of time required to recover the initial outlay on the project Or It is the time required to recover the original investment through income generated from the project.

$$\text{Pay-Back Period} = \frac{\text{Original Cost of Investment}}{\text{Annual Cash Inflows or Savings}}$$

Pros: - a) It is easy to operate and simple to understand.

b) It is best suited where the project has shorter gestation period and project cost is also less.

c) It is best suited for high risk category projects. Which are prone to rapid technological changes.

d) It enables entrepreneur to select an investment which yields quick return of funds.

Pay-Back Period Method

- Cons:** - a) It Emphasizes more on liquidity rather than profitability.
b) It does not cover the earnings beyond the pay back period, which may result in wrong selection of investment projects.
c) It is suitable for only small projects requiring less investment and time
d) This method ignores the cost of capital which is very important factor in making sound investment decision.

Decision Rule: - A project which gives the shortest pay-back period, is considered ACCEPTABLE to be the most

For Example: - If a Project involves a cash outlay of Rs. 2,00,000 and the Annual Cash inflows are Rs. 50,000, 80,000, 60,000, and 40,000 during its economic life of 4 years.

$$\text{Here Pay-Back Period} = 3 \text{ years} + \frac{10,000}{40,000}$$

Pay-Back Period = 3 years + 0.25 Or 3 years and 3 months.

Accounting Rate of Return Method

- This method is considered better than pay-back period method because it considers earnings of the project during its full economic life. This method is also known as Return On Investment (ROI). It is mainly expressed in terms of percentage.

$$\text{ARR or ROI} = \frac{\text{Average Annual Earnings After Tax}}{\text{Average Book Investment After Depreciation}} * 100$$

Here, Average Investment = (Initial Cost – Salvage Value) * 1 / 2

Decision Rule

In the ARR, A project is to be ACCEPTED when (If Actual ARR is higher or greater than the rate of return) otherwise it is Rejected and In case of alternate projects, One with the highest ARR is to be selected.

Accounting Rate of Return Method

Pros: - a) It is simple to calculate and easy to understand.

b) It considers earning of the project during the entire operative life.

c) It helps in comparing the projects which differ widely.

d) This method considers net earnings after depreciation and taxes.

Cons: - a) It ignores time value of money.

b) It lays more emphasis on profit and less on cash flows.

c) It does not consider re-investment of profit over years.

d) It does not differentiate between the size of investments required for different projects.

For Example: -

	<u>Project A</u>	<u>Project B</u>
Investment	25,000	37,000
Expected Life (In Yrs.)	4	5
Net Earnings (After Dep. & Taxes)		
Years		
1	2500	3750
2	1875	3750
3	1875	2500
4	1250	1250

If the Desired rate of return is 12%, which project should be selected?

NPV (Net Present Value) Method

This method mainly considers the time value of money. It is the sum of the aggregate present values of all the cash flows – positive as well as negative – that are expected to occur over the operating life of the project.

$$\text{NPV} = \text{PV of Net Cash Inflows} - \text{Initial Outlay (Cash outflows)}$$

- **Decision Rule:** -
 - If NPV is positive, ACCEPT
 - If NPV is negative, REJECT
 - If NPV is 0, then apply Payback Period Method
- The standard NPV method is based on the assumption that the intermediate cash flows are reinvested at a rate of return equal to the cost of capital. When this assumption is not valid, the investment rates applicable to the intermediate cash flows need to be defined for calculating the modified NPV.

NPV (Net Present Value) Method

- Pros and Cons of NPV: -

- Pros: -

- This method introduces the element of time value of money and as such is a scientific method of evaluating the project.
- It covers the whole project from start to finish and gives more accurate figures
- It Indicates all future flows in today's value. This makes possible comparisons between two mutually exclusive projects.
- It takes into account the objective of maximum profitability

- Cons: -

- It is difficult method to calculate and use.
- It is biased towards short run projects.
- In this method profitability is not linked to capital employed.
- It does not consider Non-Financial data like the marketability of a product.

NPV (Net Present Value) Method

For Example: -

Initial Investment – 20,000

Estimated Life – 5 years

Scrap Value – 1,000

XYZ Enterprise's Capital Project

<i>Year</i>	<i>Cash flow</i>	<i>Discount factor</i>	<i>Present Value</i>
		@10%	
1	5,000	0.909	4,545
2	10,000	0.826	8,260
3	10,000	0.751	7,510
4	3,000	0.683	2,049
5	2,000	0.621	1,242
5	1,000	0.621	<u>621</u>

PV of Net Cash Inflows = **24,227**

NPV = PV of Net Cash Inflows – Cash Outflows

= 24,227 – 20,000

NPV = 4,227

Here, NPV is Positive (+ ve) The Project is ACCEPTED.

Profitability Index Method

Profitability Index is the ratio of present value of expected future cash inflows and initial cash outflows or cash outlay. It is also used for ranking the projects in order of their profitability. It is also helpful in selecting projects in a situation of capital rationing. It is also known as Benefit / Cost Ratio (BCR).

$$PI = \frac{\text{Present value of Future cash Inflows}}{\text{Initial Cash Outlay}}$$

Decision Rule: - In Case of Independent Investments, ACCEPT a Project If a PI is greater (> 1) and Reject it otherwise.

In Case of Alternative Investments, ACCEPT the project with the largest PI, provided it is greater than (> 1) and Reject others.

Profitability Index Method

Pros: - a) It is conceptually sound.

b) It considers time value of money.

c) It Facilitates ranking of projects which help in the selection of projects.

Cons: - a) It is vulnerable to different interpretations.

b) Its computation Process is complex.

For Example: - In Case of Above Illustration: -

Here $PI = \frac{\text{Present Value of Cash Inflows}}$

$\frac{\text{Present Value of cash Outflows}}$

$= \frac{24,227}{20,000}$

$PI = 1.21$

Here, The PI is greater than ONE (> 1), so the project is accepted.

IRR (Internal Rate of Return) Method

- This method is known by various other names like Yield on Investment or Rate of Return Method. It is used when the cost of investment and the annual cash inflows are known and rate of return is to be calculated. It takes into account time value of Money by discounting inflows and cash flows. This is the Most alternative to NPV. It is the Discount rate that makes it NPV equal to zero.
- In this Method, the IRR can be ascertained by the Trial & Error Yield Method, Whose the objective is to find out the expected yield from the investment.

$$= \text{Smaller discount rate} + \frac{\text{NPV @ Smaller rate}}{\text{Sum of the absolute values of the NPV @ smaller and the bigger Discount rates}} \quad \text{Bigger X discount rate} - \text{Smaller discount rate}$$

NPV Vs IRR

Decision Rule: - In the Case of an Independent Investment, ACCEPT the project if

Its IRR is greater than the required rate of return and if it is lower, Then Reject it. In Case of Mutually Exclusive Projects, ACCEPT the project with the largest IRR, provided it is greater than the required rate of return & Reject others.

Pros: - a) It considers the profitability of the project for its entire economic life and hence enables evaluation of true profitability.

b) It recognizes the time value of money and considers cash flows over the entire life of the project.

c) It provides for uniform ranking of various proposals due to the percentage rate of return.

d) It has a psychological appeal to the user. Since values are expressed in percentages.

Cons: - a) It is most difficult method of evaluation of investment proposals.

b) It is based upon the assumption that the earnings are reinvested at the Internal Rate of Return for the remaining life of the project.

c) It may result in Incorrect decisions in comparing the Mutually Exclusive Projects.

NPV Vs IRR

- It is calculated in terms of currency.
 - It recognizes the importance of market rate of interest or cost of capital.
 - The PV is determined by discounting the future cash flows of a project at a predetermined rate called cut off rate based on cost of capital.
 - In this, intermediate cash flows are reinvested at a cutoff rate.
 - Project is accepted, If NPV is + ve .
- It is expressed in terms of the percentage return.
 - It does not consider the market rate of interest.
 - The PV of cash flow are discounted at a suitable rate by hit & trial method which equates the present value so calculated the amount of investment.
 - In this, intermediate cash inflows are presumed to be reinvested at the internal rate of return.
 - Project is accepted, if $r > k$.

Assessment of NPV & IRR Method

	<u>NPV</u>	<u>IRR</u>
<u>Theoretical Considerations:</u> -		
a) Does the method discount all cash flows?	Yes	Yes
b) Does the method discount cash flows at the opportunity cost of funds?	Yes	No
c) From a set of M.E. Projects, does the method choose the project which maximizes shareholder wealth?	Yes	No
<u>Practical Considerations:</u> -		
a) Is the Method Simple?	Yes	Yes
b) Can the method be used with limited information?	No	No
c) Does the method give a relative measure?	No	No

PROJECT APPRAISAL: Tips & Tricks

- Don't assume anything, don't take anything for granted.
- Assumption is the mother of all failures.
- All the data / information should be checked and, wherever possible, counter-checked through inter-firm and inter-industry comparisons.
- Check everything.
- Then double-check everything.

Sources and further reading

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- Commission, Regional Policy, *Guide to Cost -Benefit Analysis of Investment Projects*, July 2008 Edition.
- Campbell, Harry F.; Brown, Richard (2003). "Incorporating Risk in Benefit-Cost Analysis". *Benefit-Cost Analysis: Financial and Economic Appraisal using Spreadsheets*. Cambridge: Cambridge University Press
- <http://www.sbp.org.pk/departments/ihfd/2013/Mar/Credit%20Appraisal%20and%20Evaluation.pptx>

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End of Session

Thank you for your attention!

Q&A