Capital Budgeting Part I

Dr. Ram Chandra Rai

Sr.Professor (Finance Management)

Railway Staff College,

Vadodara, 390004

Module Objectives

- To understand & appreciate following relationships
- Resource Mobilization Strategy (RMS) & change in financial health (Value Addition)
- Fundamental economics, Investment Strategy (IS) & Resource Mobilization Strategy (RMS)

Module Objectives - Contd

- Investment Strategy (IS), Operational Strategies & Capacity Utilization
- Investment Strategy (IS), Cost Structure, Cost Behavior & Actual Economics
- Timings of Cash Flows & Financial Health
- Growth of Demand, Investment Strategy(IS) & Financial Health

Module Objectives - Contd

- Be able to ascertain financial, economic & social value of an investment opportunity.
- Be able to simulate values of capital budgeting options and formulate optimal capital budget which maximizes value for stakeholders.

Module Objectives - Contd

- Be able to formulate supportive strategies in the areas of resource mobilization, project management, operations, marketing and performance evaluation to ensure results as per plan.
- Be able to formulate project with balanced asset mix to ensure capacity optimization (minimum bottlenecks)

Role of Corporate Finance

- Maximize shareholders value by
- ➢ In-depth appraisal of Investments proposals to ensure that projects with positive NPV are selected
- ➢ Resource mobilization at minimum cost of capital with suitable hedging arrangements
- ➢ Cost controls to minimize cash outflows during construction & operation period
- ➢ Working capital Management

Role of Public Finance

- Ensure net contribution to national exchequer from commercial enterprises
- Enhance internal surplus to finance investment requirements for realizing corporate objectives.
- Ensure delivery of services at minimum cost to customers, all of them being owners also within the parameters of corporate viability.

Role of Public Finance – contd.

- Expenditure controls in non-remunerative activities to ensure prudent use of public funds
- Ensure expenditure as per public policy and parliamentary sanctions.
- Meet out the objection of statutory audits.
- Render financial advice to administration including investments.

Resource Allocation Issues

- Which projects should be accepted?
- How should the productivity (Financial, Economic & Social) of capital be measured?
- Should we focus on investments that reduces cost/improve profit or add capacity?
- What should be mix of cost reducing/profit improving and capacity creating investments?

Resource Allocation Issues-contd

- What happens to the risk complexion of the firm if investment under consideration is accepted ?
- What would happen to the competitive position of the firm if the project under consideration is accepted ?

Need for objective investment Analysis & Appraisal

- To right size projects to bare minimum functional utility to avoid wastages in buildings /other assets.
- Cost of project(cash out flows) has been realistically estimated after actual field survey with regards to
- ✓ Quantity
- ✓ Rates
- ✓ Implementation Schedule as per demand growth pattern

Need for objective investment Analysis & Appraisal--contd

- ✓ Escalation during construction period.
- ✓ Interest during construction period.
- ✓ Contingencies
- To ensure that various inputs of the cost of production and other overhead costs(cash outflows) have been realistically estimated.

Need for objective investment Analysis & Appraisal--contd

- To ensure correctness of estimates of sales with regards to
  - Quantity
  - Price
  - Timings
- To ensure productivity of capital (Profit potential of the project) has been correctly estimated.

Need for objective investment Analysis & Appraisal--contd

- Ascertain expected cost of capital under various financing models
- ✓ Total grant from state budget Budgetary Constraints.
- ✓ Part grant and part interest bearing capital from state budget. (Budgetary constraints due to demand of other sectors like education, health, Law & Order).

Need for objective investment Analysis & Appraisal--contd

- Plan Resource mobilization strategy depending upon nature of the project i.e. profit and risk potential of the project and its economic & social contribution
- ✓ Part budgetary support and part private funding(Capital market)- Private participation
- ➢ Domestic markets
- ➢ International markets
- ✓ Total Funding from private sector with full risk expense for bankable projects.

Need for objective investment Analysis & Appraisal--contd

- Drop optional projects unless they are bankable/viable to be financed from private equity/debt.
- Accept projects in order of profitability taking into account resources available

Need for objective investment Analysis & Appraisal--contd

- ✓ 100% of private participation with full risk exposure.
- ✓ Private participation through debt capital with full govt. guarantee(No risk)
- ✓ Equity participation by private sector in part with risk sharing arrangements.
- ✓ Private equity/debt with no risk(payment of access charges as annuity of investment(including profit)

Need for objective investment Analysis & Appraisal--contd

- ✓ Total state funding
- ✓ Total state funding but operation and management of private sector on lease rentals.
- Investment deferment plan to ensure demand generation as anticipated.
- Assess contingent liabilities of the Govt. realistically in respect of projects viable on socio-economic considerations.
- Unmask demand risks and enter into buy-purchase agreements.

Need for objective investment Analysis & Appraisal--contd

- Identify corporate strategies to ensure realization of cash flows as estimated in the areas of
- ✓ Marketing to realize sales forecast.
- ✓ Risk Management to minimize the negative impact on cash flows.
- ✓ Partnership with private sector

Need for objective investment Analysis & Appraisal--contd

- ✓ Unbundling and privatization/Corporatization
- ✓ Cost controls
- ✓ Takeovers/mergers etc.
- ✓ Long term financial planning

Project Beneficiaries

- Direct
- Indirect

Direct Project Beneficiaries

- Investors promoters (Return of equity)
- Creditors(Interests on loans)
- Employees(Wages, bonus, housing, facilities)
- Customers(better services/products at cheaper cost)
- Govt (Increase tax receipts)

Indirect Project Beneficiaries

- Economy
- Society

Types of Socio-Economic Benefits

- Increase in house hold income due to
- ✓ More employment due to increased agricultural activity, industrial & service.
- ✓ Increase in productive man days due to reduction in traveling time and reduction in incidence of sickness.
- ✓ Saving in expenditure on drugs etc. due to less pollution .

Types of Socio-Economic Benefits--contd

- ✓ Increase in dividends, interests on deposits etc.
- ✓ availability of cheaper products/ services.
- Optimum utilization of resources (Fuel, industrial capacity)
- Increase in tax receipts to Govt.
- Improved productivity in agriculture industry, and service sector.
- Increase corporate savings due to better capacity utilization

Types of Socio-Economic Benefits --contd

- Increase domestic income leads to
- Increase in demand of goods and services
- Increase in tax receipt of Govt.
- Better quality of life
- Increase in domestic net savings.
- Increase in investments
- Faster Economic development
- Faster Area development

Social Benefits

- Reduction in pollution
- Rural connectivity due to irrigation canal roads
- Development due to better connectivity
- Increased social interaction

Pollution Control Benefits

- Reduction in respiratory disease
- Reduction in exp on drugs
- Improvement in productive man days
- Improvement in house hold income /savings

Nature of Costs / Benefits

- Easily quantifiable
- Difficulty to quantify
- Non quantifiable

Analysis & Appraisal Methods

- Financial Analysis & Appraisal (quantifiable)
- Economic Analysis & Appraisal (Quantifiable)
- Social cost benefit Analysis & Appraisal of difficult to quantify & not quantifiable costs/benefits- only qualitative assessment to be done and decision taken.

Analysis & Appraisal Methods Contd.

- Social cost benefit analysis & appraisal
- ✓ Evaluate cost and benefits of difficult to quantify factors associated with projects & Attempt to assign values to these variables
- ✓ See whether they could change NPV
- ✓ Qualitative assessment of not quantifiable costs/benefits
- ✓ Be cautious

Cycle of Value

- Investment/ Grant by Govt/Payment to private parties
- Recovery through increased taxation due to higher economic growth
- Time lag between project investment and increase in tax revenues.
- Gap to be filled by private investment on assured annuity/lease payments by Govt. to private party
- Economic development has to be pushed

Time Value of Money

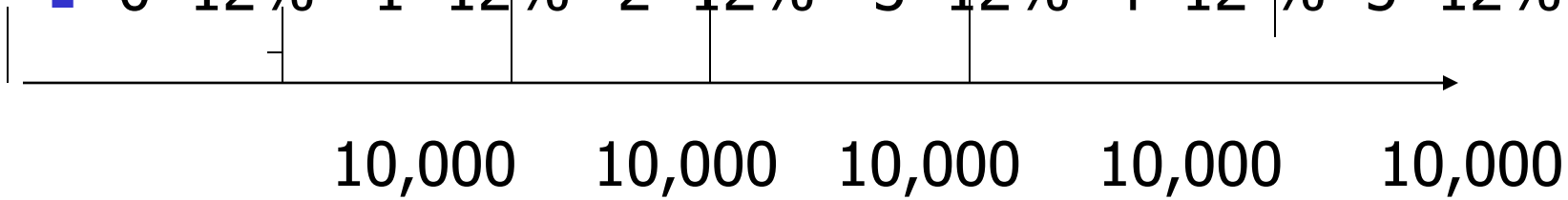
- **Time value of Money**- Why important?
- A rupee today is more valuable that a rupee after one year because
- ✓ Current consumption preferred over future consumption.
- ✓ Productivity of capital- rupee invested/employed in the period (one year) generate positive return. Rs.1.00 will become (1+r) if r is annual rate of return
- ✓ In inflationary time a rupee today has more purchasing power than after one year

Pattern of Cash Flows-Issues

- Cash flows occur at different times
- Cash flows (inflows, outflows and net) have to be brought to the same reference point for aggregation and comparison of likes.
- Usage of concept of time value of money and techniques of discounting essential for Valuation of securities & Projects

Time Line

- Cash flow streams of Rs.10,000/- at the end of each of 5 years
- 0 12% 1 12% 2 12% 3 12% 4 12 % 5 12%



0 = present time

- No discounting required in zero year as it is already at present value

Notions used

- PV=Present value
- FVn,r=Future value N year hence
- Ct=Cash flow occurring at the end of the year
- A=A stream of constant periodical cash flows over a given time
- r =Interest/cost of capital or discount rate
- n =a number of periods over which cash flow occurs

Notions used--contd

- $(1+r)^n$=Future value interest factor
- Future value of a single amount can be shown as
  - $FVn,r = PV(1+r)^n$
  - Consult future value interest table
  - Assumption-Each interest payment due is reinvested to earn future interest.
- Present value of a single amount can be shown as

  $PV = FVn\{1/(1+r)^n\}$
- Present value of uneven series can be shown as
- $PVr,n = A1/(1+r) + A2/(1+r)^2 + ---+ An/(1+r)^n$
  - (PVr,n=Present value of cash flow stream)

Future value of annuity

- Constant cash flow occurring at regular intervals e.g. premium of LIC
- $FVAn=A(1+r)^{n-1}+A(a+r)^{n-2}+-------+A$
- $=A\ [\ \{(1+r)^{n}---1\}/r]$

Applications

- To know the maturity value of recurring bank deposit at the end of the period.
- To know the accumulated amount in PF if x amount is deposited for 30 years @ y % interest rate
- How much to save annually if we want to buy a house for Rs. 20 lakhs after five years @interest rate of 12 %
- FVIFA n=5, r=12=$\frac{(1.12)^5-1}{0.12}$ =6.353
- Annual saving Rs.20 lakhs /6.353=Rs.3,14,882

Present value of Annuity

- $PV_{r,n}=A/(1+r)+A/(1+r)^2+----A/(1+r)^n$
- $=A[\{1-1/(1+r)^n\}/r]$
- Applications
  - How much to borrow for a car if annual saving is Rs.x?
  - Find maturity period of a loan given annual payment at a given interest rate

Present value of Annuity--contd

- Short (Less than a year) discount period
- $PV=FVn\ [\{1/(1+r/m)]^{mn}$
- PV=Present value
- FVn=Cash flow after n years
- M=number of time per year for which discounting to be done
- R=Annual discount rate

Concept of value

- Value is the fair price at which an asset can be bought/sold without any influence or coercion in an efficient market. It can be of the following types.
  - Liquidation value-Amount that than be realized when an asset/group of assets is sold separately from the operating organisation
  - Going concern value-amount that can be realised if the firm is sold as going concern.

Concept of value--contd

- Book Value (BV)- it is accounting value i.e. historical cost less accumulated depreciation or amortization

- Market Value (MV)-It is price at which asset is traded in the market - for profitable company MV>BV

Concept of value--contd

- Intrinsic Value (IV)- It is present value of cash flow stream expected from the said asset discounting at the rate appropriate to the risk associated with it. It is also called economic value

- In a efficient market MV=IV

- Valuation exercise seeks to ascertain intrinsic value