Capital Budgeting

Capital budgeting, which is also called "**investment appraisal**," is the planning process used to determine which of an organization's long term investments such as new machinery, replacement machinery, new plants, new products, and research development projects are worth pursuing. It is to budget for major capital investments or expenditures. One of the primary goals of capital budgeting investments is to increase the value of the firm to the shareholders.

Capital Budgeting projects are classified as either **Independent Projects** or **Mutually Exclusive Projects**.

An **Independent Project** is a project whose cash flows are not affected by the accept/reject decision for other projects. Thus, all **Independent Projects** which meet the Capital Budgeting criterion should be accepted.

Mutually Exclusive Projects are a set of projects from which at most one will be accepted. For example, a set of projects which are to accomplish the same task. Thus, when choosing between "Mutually Exclusive Projects" more than one project may satisfy the Capital Budgeting criterion. However, only one, *i.e.*, the best project can be accepted.

Why the Need for Capital Budgeting

1. As large sum of money is involved which influences the profitability of the firm making capital budgeting an important task.
2. Long term investment once made cannot be reversed without significant loss of invested capital. The investment becomes sunk and mistakes, rather than being readily rectified, must often be borne until the firm can be withdrawn through depreciation charges or liquidation. It influences the whole conduct of the business for the years to come.
3. Investment decision are the base on which the profit will be earned and probably measured through the return on the capital. A proper mix of capital investment is quite important to ensure adequate rate of return on investment, calling for the need of capital budgeting.

The implication of long term investment decisions are more extensive than those of short run decisions because of time factor involved, capital budgeting decisions are subject to the higher degree of risk and uncertainty than short run decision

Factors Influencing Capital Budgeting

- Availability of funds
- Structure of capital
- Taxation Policy
- Government Policy
- Lending Policies of Financial Institutions
- Immediate need of the Project
- Earnings

- Capital Return
- Economic Value of the Project
- Working Capital
- Accounting Practice
- Trend of Earning
- Risk of the business
- Forecast of the market
- POlitical unrest
- Geographical Condition
- Exchange Rate of Currency

Funding Sources/ Sources of capital

Capital budgeting investments and projects must be funded through excess cash provided through the raising of

- **Debt capital (**Debt capital is borrowed cash, usually in the form of bank loans, or bonds issued to creditors**)**
- **Equity capital (**Equity capital are investments made by shareholders, who purchase shares in the company's stock**)**
- **Retained earnings (**Retained earnings are excess cash surplus from the company's present and past earnings**)**

Cost of Capital: is the discount rate which should be used in capital budgeting. It reflects the firm's cost of obtaining capital to invest in long term assets. Thus it reflects a weighted average of the firm's cost of debt, cost of preferred stock and cost of common stock.

Major Methods

A Capital Budgeting decision rule should satisfy the following criteria:

- Must consider all of the project's cash flows.
- Must consider the Time Value of Money
- Must always lead to the correct decision when choosing among Mutually Exclusive Projects.

Many formal methods are used in capital budgeting, including the techniques as followed:

- Net present value
- Internal rate of return
- Payback period
- Profitability index

- Equivalent annuity
- Real options analysis

Net Present Value

Net present value (NPV) is used to estimate each potential project's value by using a discounted cash flow (DCF) valuation. This valuation requires estimating the size and timing of all the incremental cash flows from the project. The NPV is greatly affected by the discount rate, so selecting the proper rate–sometimes called the hurdle rate–is critical to making the right decision.
This should reflect the riskiness of the investment, typically measured by the volatility of cash flows, and must take into account the financing mix. Managers may use models, such as the CAPM or the APT, to estimate a discount rate appropriate for each particular project, and use the weighted average cost of capital (WACC) to reflect the financing mix selected. A common practice in choosing a discount rate for a project is to apply a WACC that applies to the entire firm, but a higher discount rate may be more appropriate when a project's risk is higher than the risk of the firm as a whole.

Internal Rate of Return

The internal rate of return (IRR) is defined as the discount rate that gives a net present value (NPV) of zero. It is a commonly used measure of investment efficiency.

The IRR method will result in the same decision as the NPV method for non-mutually exclusive projects in an unconstrained environment, in the usual cases where a negative cash flow occurs at the start of the project, followed by all positive cash flows. Nevertheless, for mutually exclusive projects, the decision rule of taking the project with the highest IRR, which is often used, may select a project with a lower NPV.

One shortcoming of the IRR method is that it is commonly misunderstood to convey the actual annual profitability of an investment. Accordingly, a measure called "Modified Internal Rate of Return (MIRR)" is often used.

Payback Period

Payback period in capital budgeting refers to the period of time required for the return on an investment to "repay" the sum of the original investment. Payback period intuitively measures how long something takes to "pay for itself. " All else being equal, shorter payback periods are preferable to longer payback periods.

The payback period is considered a method of analysis with serious limitations and qualifications for its use, because it does not account for the time value of money, risk, financing, or other important considerations, such as the opportunity cost.

Profitability Index

Profitability index (PI), also known as profit investment ratio (PIR) and value investment ratio (VIR), is the ratio of payoff to investment of a proposed project. It is a useful tool for ranking projects, because it allows you to quantify the amount of value created per unit of investment.

Equivalent Annuity

The equivalent annuity method expresses the NPV as an annualized cash flow by dividing it by the present value of the annuity factor. It is often used when comparing investment projects of unequal lifespans. For example, if project A has an expected lifetime of seven years, and project B has an expected lifetime of 11 years, it would be improper to simply compare the net present values (NPVs) of the two projects, unless the projects could not be repeated.

Real Options Analysis

The discounted cash flow methods essentially value projects as if they were risky bonds, with the promised cash flows known. But managers will have many choices of how to increase future cash inflows or to decrease future cash outflows. In other words, managers get to manage the projects, not simply accept or reject them. Real options analysis try to value the choices–the option value–that the managers will have in the future and adds these values to the NPV.

These methods use the incremental cash flows from each potential investment or project. Techniques based on accounting earnings and accounting rules are sometimes used. Simplified and hybrid methods are used as well, such as payback period and discounted payback period.

Difference Between NPV and IRR: Net Present Value and Internal Rate of Return decision rules consider all of the project's cash flows and the Time Value of Money. As we shall see, only the Net Present Value decision rule will always lead to the correct decision when choosing among *Mutually Exclusive Projects*. This is because the Net Present Value and Internal Rate of Return decision rules differ with respect to their *Reinvestment Rate Assumptions*. The Net Present Value decision rule implicitly assumes that the project's cash flows can be reinvested at the firm's *Cost of Capital*, whereas, the Internal Rate of Return decision rule implicitly assumes that the cash flows can be reinvested at the projects IRR. Since each project is likely to have a different IRR, the assumption underlying the Net Present Value decision rule is more reasonable.

RISK: The potential that a chosen action or activity (including the choice of inaction) will lead to a loss (an undesirable outcome).

VOLATILITY: A quantification of the degree of uncertainty about the future price of a commodity, share, or other financial product.

CAPITAL BUDGETING AND POSSILBLE RISKS ASSOCIATED WITH IT

The increasing volatility of the global economy has caused investors to search out safer investment alternatives. Investors use a capital budget when selecting their investments. Risk is inevitable to these investments. The various risks include cash flows not being paid in time as agreed, the risk of the investee company collapsing and also the management sinking the invested funds in risky projects. By incorporating risk in capital budgeting, investors can minimize losses. The list of possible risks are presented in the table below.

Possible risks	Measures to mitigate the risk
Operational risks	
Weather conditions or pests affect crop yields	Provide technical solutions to farmers; calculate with careful scenarios; deal in different crops at a time.
Farmers sell their production to other buyers	Offer farmers an attractive price and pay immediately; build loyalty by involving the farmers in your business. Try to understand how the other buyers are competing with you, and whether it is temporary or permanent.
Theft	Rent a store with a proper door and lock; have it guarded.
Quality deterioration during storage (insect infestation, moulds etc.)	Chose suitable storage facilities, keep the place clean, dry and windows meshed. Monitor pests with traps. Regularly take product samples and check them.
Product getting wet, dirty, or damaged during transportation	Use a reliable transport service. Make sure that the truck is clean, that nothing else is loaded up. Tell them you must be informed immediately in case of an accident or breakdown.
Product getting damaged or lost during export shipment	Make sure that the container is well loaded (take photos). Make sure that the shipment is sufficiently insured by the importer (if FOB conditions) or by yourself (if CIF conditions).
Financial risks	
Payments to farmers disappear on the way	Handle payments via bank accounts; involve farmer organisations in handling the payments to farmers.
Margins are not sufficient to cover operational costs	Increase efficiency, reduce production costs per unit. Calculate with leeway for unforeseen costs and sufficient target margins.
No loans can be obtained to maintain cash flow	Organise trade loans in time; agree with farmers and clients when payments are to be made.
The buyer does not pay, or pays less after having received the product	Know and trust your client (track record); work with FOB, Letters of Credit, CAD with your preferred bank. Send correct samples, have a good agreement on handling discounts.
Market risks	
Demand for the product slows down, no buyer can be found	Check-out market trends before entering into contracts; diversify your business. Look into local-regional markets, look into storing.
Clients do not honour the contracts and do not buy the committed volume	Build strong partnerships; negotiate solid contracts; arrange for alternatives, even with the buyer who did not buy.
Competitors offer the product at lower price or better quality	Continuously work on reducing production costs and improving quality. Be more reliable than the competition. When it is structural, shift focus, diversify.
Sudden increase in local price	Communicate with your buyers in good time. Decide together whether to sit it out or cancel the contract.
Sales prices for the product decrease	Pay farmers in two instalments (see chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**); the second payment depending on the realised sales price.
Fluctuations in exchange rate	Negotiate sales prices in local currency or in a relatively staple currency (e.g. EUR); sell "back to back" (see next paragraph).