# Chapter 1: Feasibility Studies: An Overview

Introduction

## 1.1 Introduction

Every long term decision the firm makes is a *capital budgeting decision* whenever it changes the company's cash flows. Consider launching a new product. This involves a phase where the new product is advertised and distributed. Hence, the firm will have cash outflows for paying advertising agencies, distributors, transportation services etc. Then, *for a long period of time,* the firm has cash inflows from the sale of the product in the future. Alternatively, consider the decision to make or buy a certain component the firm needs as an input it currently purchases from another company. Making the input requires payments for labor and materials, but saves payments to the supplier, and all these cash inflows and outflows are affected by that decision.

Many decisions affect the cash flows

**Many other decisions affect the company's cash flows such as:**

- **Choice of** distribution channel
- **Purchases** of buildings
- **Choice of** geographical location
- **Purchase of another** company or sale of a division
- **Leasing or buying a certain** piece of equipment
- **Reducing dividend payments** in order to pay down bank debt

*The difficulty with making these decisions is that typically,* many cash flows are affected, and they usually extend over a long period of time. *Investment appraisal* criteria help us in analyzing capital budgeting decisions by aggregating the multitude of cash flows into one number.

*Investment projects start with the identification of an investment idea and or investment opportunity*. Project ideas may arise from studies of the product-consumption pattern of the country, market studies, surveys of existing industrial establishments, import schedules…..etc. All ideas for projects are valuable and may prove to be the beginning of the project. However, each investment idea should be first studied. This study is called a *pre-feasibility study* or *preliminary feasibility study*. The purpose of this stage is to determine whether the project idea should be studied in more details and the scope of future studies; i.e.

purpose of the pre-feasibility study

**The purpose of the pre-feasibility study is to answer the following questions:**

Is it feasible to continue to study this investment project?
Is it feasible to spend more resources (money, time) to extend this feasibility study?
Are there any constraints (legal, technological, environmental, and ethical) over the investment project?

The pre-feasibility study is prepared on the basis of available data in published form that can be easily collected and worked out. If the pre-feasibility study indicates that the proposed project appears to be a promising one, the decision may be taken to proceed further with the complete or integrated feasibility study.

Types of Feasibility Studies

## 1.2 Types of Feasibility Studies

To implement any project, the investor needs to carry out different types of *feasibility studies*. These feasibility studies evaluate all the *risks* and *returns related to that project* and try to balance them and help the investor to finalize his/her plans. Different feasibility studies include:

Market Feasibility

### 1.2.1 Market Feasibility

*This is a critical analysis because the output of any factory has to sell in the market place for the promoter to earn revenues.* Very often demand analysis and projections are optimistic leading to problems in the future. Another observation has been that products that sell abroad may not have a market locally. Egypt, in general is a cost conscious market and the investor has to keep this in the back of his mind.

*The main purpose of the marketing study is to determine the market share of the investment project.* This will be determined first by calculating the *market gap*, then determining the percentage of that gap that the project will cover.

The market gap

**The market gap =** Total demand on the product or service **–**Total supply (fully imported goods, fully local produced goods, and mix between imported and local suppliers).

Usually at the preliminary point the market share will be less than the market gap, however after introducing the new product the market share may be greater than the market gap.

**However,** *in assessing the marketability of the projected products and services, one should distinguish between those categories:*

- *New to the world products* (New products that create new market).
- *New products lines* (New products that allow a company to enter an established market).
- Additions to existing product lines. New products that supplement a company's established product lines.
- *Improvements in or revisions in existing products* (New products that provide improved performance or greater value and replace existing products).
- *Repositioning* (Existing products that are targeted to new markets or market segments).
- *Cost reduction* (New products that provide similar performance at lower cost).

Managerial Feasibility

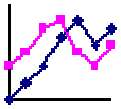
### 1.2.2 Managerial Feasibility

Every business has different requirements from the management. Businesses, which are complex require significant experience on part of top management to run it. Management expertise is not only in technical know-how but also in understanding market dynamics, ability to distribute product effectively, manage manpower and environment.

In cases where a multi-national company (MNC), which has a long track record and significant experience, is implementing a project, it would be an added comfort about management feasibility. In businesses, which are technologically driven based on intellectual capital, technocrats would be preferred.

Economic Feasibility

### 1.2.3 Economic Feasibility



The project has to generate an acceptable *rate of return*, which adequately covers its *cost of capital*. The expected rate of return depends on the risk profile of the project. In a rational economic world, nobody implements a project to make losses. In other words, net present value has to be positive if you discount the cash flows by the desired rate of return.

Commercial Feasibility

### 1.2.4 Commercial Feasibility (Availability of Key Factors)

Commercial feasibility refers to availability of raw material, skilled labor, infrastructure, and other factors of production. A number of projects have run into rough weather due to poor commercial viability.

Financial Feasibility

### 1.2.5 Financial Feasibility

The ability to raise money to implement the project is of paramount importance. The promoter (investor) should be capable of raising funds either from his own sources or from banks and institutions. One area that often gets overlooked is contingency planning. In most cases, the first generation entrepreneur has problems in raising funds to implement his project, and even if he does so, he lacks staying power and is not able to withstand unforeseen problems like delays and overruns.

Technical Feasibility

### 1.2.5 Technical Feasibility

*An investor should have the requisite number of technically capable people as well as technology required to set up and run the plant*. The technology should be such that is can adapt to local conditions. Technology transfer from overseas often fails in this regard. The conditions in USA and Europe are quite different from Egypt. Most parts of Egypt are hot and dusty. Sophisticated process controls have known to fail. Therefore, knowledge and suitability to local conditions is very important.

Social Feasibility

### 1.2.6 Social Feasibility

Many a time plants may be viable economically and financially but would be socially undesirable. In the last 5 years, Egypt is slowly becoming environment conscious and friendly. Therefore, using hazardous chemicals or polluting industries may not get the necessary clearances.

Long-Term Investment Analysis

## 1.3 Long-Term Investment Analysis

*Long-term investment decisions represent sizable outlays of funds that commit a firm to some course of action.* Thus, the firm needs procedures to analyze and properly select its long-term investments. It must be able to measure the cash flows and apply appropriate decision techniques. The process of making such long-term investment decisions is referred to as *Capital Budgeting*.

Capital budgeting

**Capital budgeting** is the process of evaluating and selecting long-term investments that are consistent with the firm's goal of maximizing owners' wealth. Capital budgeting involves choosing among various capital projects to find the one(s) that will maximize the return on the capital invested.

*The important points are:*

- *Capital budgeting* is the most significant financial activity of the firm.
- *Capital budgeting* determines the core activities of the firm over a long-term future.
- *Capital budgeting* decisions must be made carefully and rationally.
- *Long-term investments* may be in the form of a new project, or to expand an existing firm, or to acquire a new fixed asset. In all cases, the capital budgeting decision is related to the future thus it may contain many uncertainties.
- *Capital budgeting* emphasizes the firm's goal of wealth maximization, which is expressed as maximizing an investment's Net Present Value.

Capital Budgeting Within the Firm

## 1.3.1 Capital Budgeting Within the Firm

*Many companies follow a carefully prescribed process in capital budgeting.* At least once a year, proposals for new projects are requested from each department and plant. The proposals are screened by a capital budgeting committee, which submits its findings to the officers of the company. The officers, in turn, select the projects they believe to be most worthy of funding and submit them to the board of directors. The directors approve the investment decision for the next period. The involvement of top management and the board of directors in the process demonstrate the importance of capital budgeting decisions. These decisions often have a significant impact on the future returns, as shown in Figure 1.1.

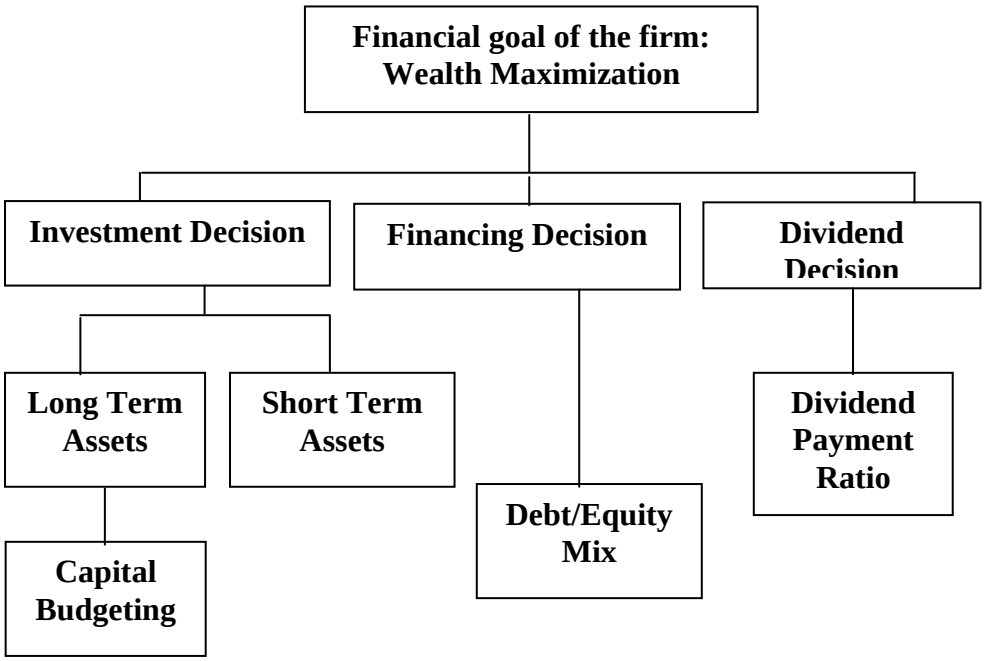



**Figure 1.1: The position of capital budgeting**

Aspects of Capital Budgeting

### 1.3.2 Aspects of Capital Budgeting

*Capital budgeting involves:*

- Committing significant resources
- Planning for the long term: 5 to 50 years.
- Decision making by senior management.
- Forecasting long term cash flows.
- Estimating long term discount rates.
- Analyzing risks.
- Calculating a project's relevant cash flows

Capital budgeting uses

**Capital budgeting uses:**

- Sophisticated forecasting techniques.
- Time series analysis by the application of simple and multiple regression, and moving averages
- Qualitative forecasting by the application of various techniques, such as the Delphi method
- Application of time value of money formulae
- Application of Net Present Value (NPV) analysis to forecasted cash flows
- Application of Sensitivity and Break Even analyses to analyze risk
- Application of Simulation and Monte Carlo Analysis as extra risk analysis
- Application of long term forecasting and risk analysis to projects with very long lives

Cash Flows

## 1.4 Cash Flows

### 1.4.1 Why Cash Flows?

*Cash flows, and not accounting estimates, are used in capital budgeting, project analysis because*:

- They measure actual economic wealth.
- They occur at identifiable time points.
- They have identifiable directional flow.
- They are free of accounting definitional problems.

**But which cash flows?** If we decide to make a component, should the cost of the factory building where it is made be included? What about the salary of the sales manager if a new product is launched?

*The answer to this question is clear and simple*: All cash flows have to be included in our analysis whenever they are affected by the decision! Hence, if launching a new product implies hiring a new sales manager, then his/her salary is included. If the sales manager

would continue to be employed anyway, then his/her salary is a cash outflow the company would incur even if the product were not launched, and then his/her salary is not included.

Similarly, the factory building may have been there already without any other use for the firm (then don't include it), or it could have been sold (then include foregone cash inflow from not selling it). Alternatively, it may exist, but using it for making a component may force us to lease another building (then include these lease payments). These cash flows are also called incremental cash flows, since they always compare the cash flows for a base scenario (do not launch product, do not make component) with an alternative scenario.

The differences of the cash flows in the base and the alternative scenario are the incremental cash flows. We denote these incremental cash flows by Xt,

Where,
$X_t > 0$ indicates that the firm's cash inflow increases in time t as a result of the decision, and
$X_t < 0$ indicates the opposite.

Hence, from a point of view of capital budgeting procedures, a decision is completely characterized by the stream of incremental cash flows. Analytically, characterizing the decision by a stream of cash flows presents us with two challenges:

1. We have to estimate these cash flows X for all periods in the future where the decision under consideration has an impact on the cash flows. This implies forecasting.
2. We have to use some investment appraisal method in order to analyze decisions where X is positive for some periods, and negative for others. We have to understand the time value of money in order to proceed correctly. We discuss the solution to this problem in the following sections. The incremental cash flows estimated here are typically uncertain, and we have to take into account that some cash flows are certain, whereas others depend on the state of the economy. We return to the problem of risk later in the course. There we shall see that we can take care of the riskiness of projects by using adequate discount rates.

The Meaning of RELEVANT Cash Flows

## 1.4.2 The Meaning of RELEVANT Cash Flows.

1. A relevant cash flow is one, which will *change* as a direct result of the decision about a project.
2. A relevant cash flow is one, which will occur in the future. A cash flow incurred in the past is irrelevant. It is sunk.
3. A relevant cash flow is the difference in the firm's cash flows with the project, and without the project.

**Relevant cash flows are also known as:** Marginal cash flows.

1. Incremental cash flows.
2. Changing cash flows
3. Project cash flows.
4. However, all titles have the same meaning.

## 1.4.3 Project Cash Flows: Yes and No.

YES

**YES: These are relevant cash flows**

- Incremental future sales revenue.
- Incremental future production costs.
- Incremental initial outlay.
- Incremental future salvage value.
- Incremental working capital outlay.
- Incremental future taxes.

NO

**NO: These are not relevant cash flows**

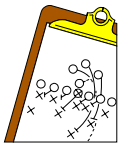
- Changed future depreciation.
- Reallocated overhead costs.
- Adjusted future accounting profit.
- Unused idle capacity cost.
- Outlays incurred in the past

Cash Flows and Depreciation

## 1.4.4 Cash Flows and Depreciation: Always a Problem

- Depreciation is NOT a cash flow.
- Depreciation is simply the accounting amortization of an initial capital cost.
- Depreciation amounts are only accounting journal entries.
- Depreciation is measured in project analysis only because it reduces taxes.

Summary



## 1.4.5 Project Cash Flows: Summary

Only future, incremental, cash flows are Relevant. Relevant Cash Flows are entered into a yearly cash flow table. Net Annual Cash Flows are discounted to give the project's Net Present Value. Thus when examining an investment proposal one should be interested only in the marginal or incremental cash flows associated with the project in question.

The incremental net cash flow of an investment proposal is defined to be the difference between the firm's cash flows if the investment project is undertaken and the firm's cash flows if the investment project is not undertaken.

Net Cash Flow = Cash Inflow - Cash Outflow

**Cash Inflows include**:

- Cash operating revenues,
- Cash proceeds from selling assets,
- Residual value of the investment at the end of its useful life.

**Cash outflows include:**

- The investment cost (the initial investment)
- Cash operating cost
- Increase in working capital
  Income tax on taxable income

The income tax paid is determined by:
Taxes = t*(Revenue - Expenses - Depreciation)

where t is the corporate tax rate. Note that depreciation is not a cash expense and only affects cash flows through its effect on taxes.

Example

## 1.4.6 Project Cash Flows: Example 1

Egyptian Investors Company is considering an immediate investment of LE. 200000 in new equipment. The new equipment is expected to last for 5 years and have LE. 50000 salvage value at the end of its useful life. The annual net cash inflows are LE. 200000, and the annual net cash outflows are LE. 100000. The company's net income is subject to 40% income tax. The company uses the straight-line method in calculating the annual depreciation.

**Required**: calculate the annual net cash flows for the new equipment.

1. The annual depreciation = The investment cost – Salvage value/Number of Years in the useful life
2. The annual depreciation = (200000 – 50000/5) = LE. 30000 (non cash item)
   5 years
3. The annual accounting net income = Total annual revenues (cash and non cash) – Total operating expenses (cash and non cash)
4. The annual accounting net income = 200000 – (100000 + 30000) = 70000

The annual income tax = The accounting net income * The income tax rate

5. The annual income tax = 70000 * 40% = 28000

The annual net cash flows = The annual net cash inflows – The net cash outflows including income tax

6. The annual net cash flows = 200000 – (100000 + 28000) = LE. 72000

These information can be summarized as follows
Net Cash Flows Estimation (amounts in LE.)

| Item | Year 0 | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 |
|---|---|---|---|---|---|---|
| Cash inflows Current Operating Revenue Residual (salvage value) | 0 | 200000 | 200000 | 200000 | 200000 | 200000 50000 |
| A-Total cash inflows | 0 | 200000 | 200000 | 200000 | 200000 | 250000 |
| Cash outflows Investment cost Current operating cash outflows Income tax | 200000 | 100000 28000 | 100000 28000 | 100000 28000 | 100000 28000 | 100000 28000 |
| B-Total cash outflows | 200000 | 128000 | 128000 | 128000 | 128000 | 128000 |
| Net Cash flows (NCF) A-B | -200000 | 72000 | 72000 | 72000 | 72000 | 132000 |

Example

## 1.4.7 Project Cash Flows: Example 2

A corporation is considering installing a machine that costs $60,000 plus installation costs of $2,000. It will generate revenues of $155,000 annually and cash expenses annually of $100,000. It will be depreciated to a salvage of $6,000 over a seven-year life using the straight-line method. Assuming the firm has a marginal cost of capital of 12 percent and is in the 34 percent marginal tax bracket, determine the incremental cash flows of this investment project. What is the annual net cash flow of this project?

**Year 0:** The incremental cash flows associated with the project in year 0 are:
Cost of new machine: $60,000 + Installation Cost: $2,000 = $62000

**Years 1-7:**
Yearly revenues: $155,000
Yearly expenses: $100,000
Yearly tax expense = Tax rate * [taxable income]
Where taxable income = revenues –expenses - depreciation.

In this case depreciation is computed using the straight line method,
D = (62,000-6,000)/7 = $8,000.
Therefore, yearly tax expense is 0.34(155,000-100,000-8,000) =$15,980.

**Year 7**
Salvage value: $6,000.

The results can be summarized in two tables.
The first computes taxable income and the tax expense. The second table computes the net cash flow.

1. **Computation of Taxable Income:**

| Year | Revenues | Expenses | Depreciation | Taxable Income | Income Tax |
|---|---|---|---|---|---|
| 1 | 155,000 | 100,000 | 8,000 | 47,000 | 15,980 |
| 2 | 155,000 | 100,000 | 8,000 | 47,000 | 15,980 |
| 3 | 155,000 | 100,000 | 8,000 | 47,000 | 15,980 |
| 4 | 155,000 | 100,000 | 8,000 | 47,000 | 15,980 |
| 5 | 155,000 | 100,000 | 8,000 | 47,000 | 15,980 |
| 6 | 155,000 | 100,000 | 8,000 | 47,000 | 15,980 |
| 7 | 155,000 | 100,000 | 8,000 | 47,000 | 15,980 |

2. **Computation of Net Cash Flows:**

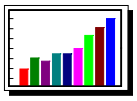
| Item | Year Zero | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 |
|---|---|---|---|---|---|---|
| Cash inflows<br>Current operating revenues<br>Residual (salvage) value | 0 | 155000 | 155000 | 155000 | 155000 | 155000<br>6000 |
| A- Total cash inflow | 0 | 155000 | 155000 | 155000 | 155000 | 161000 |
| Cash outflows<br>Investment cost<br>Current operating cash outflows<br>Income tax | 62000 | 100000<br>15980 | 100000<br>15980 | 100000<br>15980 | 100000<br>15980 | 100000<br>15980 |
| B- Total cash outflows | 62000 | 115980 | 115980 | 115980 | 115980 | 115980 |
| Net Cash Flows (NCF) A- B | - 62000 | 39020 | 39020 | 39020 | 39020 | 45020 |

Essential Formula in Project Appraisal

## 1.5 Essential Formula in Project Appraisal

Recognition of the time value of money can make a significant difference in the long-term impact of the capital; budgeting decision. For example, cash flows that occur early in the life of an investment will be worth more than those that occur later, because of the time value of money. Therefore, it is useful to recognize the timing of cash flows when evaluating projects. This part aims at explaining of the formulae and symbols used to evaluate investment projects

Fundamentals in Financial Evaluation



### 1.5.1 Fundamentals in Financial Evaluation

Money has a time value: a $ or £ or € today, is worth more than a $ or £ or € next year. A risk free interest rate may represent the time value of money. Inflation too can create a difference in money value over time. It is NOT the time value of money. It is a decline in monetary purchasing power.

Moving Money Through Time

### 1.5.2 Moving Money Through Time

Investment projects are long lived, so we usually use annual interest rates. With compound interest rates, money moved forward in time is 'compounded', whilst money moved backward in time is 'discounted'.

Financial Calculations

### 1.5.3 Financial Calculations

Time value calculations in capital budgeting usually assume that interest is annually compounded.

'Money' in investment projects is known as 'cash flows': the symbol is: Ct Cash flow at end of period t.

**The present value of a single sum is:**

$$PV = FV (1 + r)^{-t}$$

- The present value of a dollar to be received at the end of period t, using a discount rate of r.

**Example:**
Calculate the present value of $110 to be received after one year, the discount rate is 10%
PV = 110/ (1.1) = $100,
Thus, the $110 after one year has a value of $100 today.

Cash Flow Series

## 1.5.3 Cash Flow Series

The present value of a series of cash flows is:

$$PV = \sum_{1}^{t} CF_t / (1 + r)^t$$

A payment series in which cash flows are Equally sized And Equally timed is known as an annuity.

**There are three types of annuities:**

1. Ordinary annuities; the cash flows occur at the end of each time period.
2. Annuities due; the cash flows occur at the start of each time period.
3. Perpetuities; the cash flows begin at the end of the first period, and go on forever.

The present value calculations may be made manually using tables (appendix 1) or using financial calculators or using spreadsheets (Excel program). The examples illustrated below are based on manual calculations, however, the trainees may use the excel program to recalculate the figure. The formulas are illustrated in the handouts.

PV of Mixed Stream

## 1.5.4 PV of Mixed Stream of Future Cash Flows

Example: A project that has a useful life of 4 years and will give a net annual cash flows of 150, 220, 400, 540 respectively during each year of the useful life.

**Required:**

How much does it worth today if the required rate of return is 14%?
How much does it worth today if the required rate of return is 16%?
Explain the reason for the difference?

| Years | Net Cash Flow (1) | PV Factor 14% (use the table) (2) | PV of Cash Flows = (1) * (2) | PV Factor 16% | PV of Cash Flows |
|---|---|---|---|---|---|
| 1 | 150 | 0.877193 | 131.5789 | 0.862069 | 129.3103 |
| 2 | 220 | 0.769468 | 169.2829 | 0.743163 | 163.4958 |
| 3 | 400 | 0.674972 | 269.9886 | 0.640658 | 256.2631 |
| 4 | 540 | 0.59208 | 319.7233 | 0.552291 | 298.2372 |
| Total | 1310 | | 890.5738 | | 847.3064 |

If the net cash flow stream had changed to 540, 150, 400, 220, would it make any difference in the value of the project today, why?

| Years | Net Cash Flow (1) | PV Factor 14% (use the table) (2) | PV of Cash Flows = (1) * (2) | PV Factor 16% | PV of Cash Flows |
|---|---|---|---|---|---|
| 1 | 540 | 0.877193 | 473.6842 | 0.862069 | 465.5172 |
| 2 | 150 | 0.769468 | 115.4201 | 0.743163 | 111.4744 |
| 3 | 400 | 0.674972 | 269.9886 | 0.640658 | 256.2631 |
| 4 | 220 | 0.59208 | 130.2577 | 0.552291 | 121.504 |
| Total | 1310 | | 989.3506 | | 954.7588 |

PV of Constant Stream

### 1.5.5 PV of Constant Stream of Future Cash Flows (Annuity)

**Example:** A project has a useful life of 4 years and will give constant net annual cash flows of 200 during each year of the useful life. How much does it worth today if the required rate of return is 14%, and 16%

| Years | Net Cash Flow (1) | PV Factor 14% (use the table) (2) | PV of Cash Flows = (1) * (2) | PV Factor 16% | PV of Cash Flows |
|---|---|---|---|---|---|
| 1 | 200 | 0.877193 | 175.4386 | 0.862069 | 172.4138 |
| 2 | 200 | 0.769468 | 153.8935 | 0.743163 | 148.6326 |
| 3 | 200 | 0.674972 | 134.9943 | 0.640658 | 128.1315 |
| 4 | 200 | 0.59208 | 118.4161 | 0.552291 | 110.4582 |
| Total | 800 | | 582.7425 | | 559.6361 |

Alternatively, use the present value of an annuity table, look at 14% and 4 years then multiply the present value factor by $ 200.

PV of 200 annuity for 4 years @ 14% = 200 * 2.9137 = 582.7425 (same answer but faster)

PV of Constant Perpetuity

### 1.5.6 PV of Constant Perpetuity (Constant Amount That Will Last Forever)

Find the present value of $ 20 constant for unlimited period using 14% as the required rate of return

$$PV = \frac{\text{Constant Cash Flow}}{\text{Rate of return}} = \frac{20}{0.14} = \$\ 142.85$$

PV of Constant Growth Perpetuity

### 1.5.7 PV of Constant Growth Perpetuity (an Annual Amount That Will Grow With a Constant Rate and Will Last Forever)

Find the present value of an annual dividends of $ 20 that will grow with a constant rate of 4% using 14% as the required rate of return

$$PV = \frac{\text{Constant Cash Flow}}{\text{Rate of return- Growth rate}} = \frac{20}{0.14 - 0.04} = \frac{20}{0.1} = \$\ 200$$

FV of Mixed Stream

### 1.5.8 FV of Mixed Stream of Future Cash Flows

**Example:** A project has a useful life of 4 years and will give net annual cash flows of 150, 220, 400, 540 respectively during each year of the useful life, find the future values of these amounts by the end of the 4 years @ 14%.

| Years | Net Cash Flow (1) | Years left to 4 | Future value factor @ 14% | FV of Cash Flows |
|---|---|---|---|---|
| 1 | 150 | 3 | 1.4815 | 222.225 |
| 2 | 220 | 2 | 1.2996 | 285.912 |
| 3 | 400 | 1 | 1.14 | 456 |
| 4 | 540 | 0 | 1 | 540 |
| Total | 1310 | | | 1504.137 |

FV of Constant Stream

### 1.5.9 FV of Constant Stream of Future Cash Flows (Annuity)

**Example:** A project has a useful life of 4 years and will give a constant net annual cash flow of 200 during each year of the useful life. How much does it worth after 4 years if the required rate of return is 14%,

| Years | Net Cash Flow (1) | Years left to 4 | Future value factor @ 14% | FV of Cash Flows |
|---|---|---|---|---|
| 1 | 200 | 3 | 1.4815 | 296.3 |
| 2 | 200 | 2 | 1.2996 | 259.92 |
| 3 | 200 | 1 | 1.14 | 228 |
| 4 | 200 | 0 | 1 | 200 |
| Total | 800 | | | $ 984.22 |

Alternatively, use the future value of an annuity table, look at 14% and 4 years then multiply it by 200

FV of 200 annuity for 4 years @ 14% = 200 * 4.92 = $ 984 (same answer but faster)

Evaluation of Project Cash Flows

## 1.5.10 Evaluation of Project Cash Flows

Cash flows occurring within investment projects are assumed to occur regularly, at the end of each year. Since they are unlikely to be equal, they will not be annuities.

Annuity calculations apply more to loans and other types of financing.

All future flows are discounted to calculate a Net Present Value, NPV; or an Internal Rate of Return, IRR.

Decision Making With Cash Flow Evaluations

## 1.5.11 Decision Making With Cash Flow Evaluations

- If the Net Present Value is positive, then the project should be accepted. The project will increase the present wealth of the firm by the NPV amount.
- If the IRR is greater than the required rate of return, then the project should be accepted. The IRR is a relative measure, and does not measure an increase in the firm's wealth.

Essential Formula

## 1.5.12 Essential Formula -- Summary

1. The Time Value of Money is a cornerstone of finance.
2. The amount, direction and timing of cash flows, and relevant interest rates, must be carefully specified.
3. Knowledge of financial formula is essential for project evaluation.
4. NPV and IRR are the primary investment evaluation criteria.

Most financial functions can be automated within Excel program.