Chapter 2: Management Decision Making: Capital Expenditure and Chapter 3: Special Order

Continuation of Make or Buy (Module 1)

- Exercise 1
    - Fracas Airlines owns $20,000 worth of parts which were designed for an aircraft that the airline no longer uses. The airline has two options:
    - Option 1: Sell the existing parts for $17,000 and purchase new parts for $26,000.
    - Option 2: Modify the existing parts at a cost of $12,000.
    - Should Fracas Airlines keep or sell the parts?
    - Solution

	Option 1	Option 2
Proceeds from sale of parts	17,000	0
Costs to modify parts		-12,000
Cost of new parts	-26,000	
Total Costs	-$9,000	-$12,000

        - Worldwide should therefore dispose of the parts and purchase new equipment.
        - Note the exclusion of the initial cost of the equipment from the analysis.
            - Because this is classified as a sunk cost

Sunk Costs

- **Sunk costs** are those which;
    - Have already been incurred
    - Do not affect any future cost and cannot be changed by any current or future action.
- Sunk costs do not meet the definition of relevant information.

Opportunity Cost

- **Opportunity** cost: The Potential benefit that is forgone as a result of choosing one alternative over another.
- Opportunity costs meet the definition of a relevant cost.
    - They therefore need to be included in make or buy or special order decisions.

Special Orders

- On occasions, an organisation will be offered a special, once only order.
    - The price offered for the organisations products will normally be below the normal selling price.
- Using relevant costs and benefits managers must decide whether this order should be accepted or rejected.
- Exercise 1 – Fracas Airlines Excess Capacity
    - A travel agency has offered to charter a flight from Perth to Sydney return for $50,000. Fracas Airlines would normally charge $100,000 for a Perth to Sydney return flight.
    - Expenses per flight are as follows;
        - VC per flight 20,000
        - FC allocated to each flight 35,000
            - (FC = $350,000, Fracas Airlines operates 10 flights).

    - Fracas Airlines has two aircraft which are presently not being used
    - Should the offer be accepted?
    - Solution
        - Charter Price $50,000
        - Less Variable Cost -$20,000
        - Contribution from Charter $30,000
        - Since Fracas Airlines has 2 aircraft not currently being used, they should accept the special order.
- Exercise 2 Special Order – Full Capacity
    - If Fracas Airlines was at full capacity (i.e. no spare planes) how would your analysis differ??
    - To accept the offer Fracas Airlines would need to drop one of its flights. The contribution margin is $80,000 ($100,000- $20,000 {VC}).
    - Solution

Charter Price	$50,000
Less VC	-$20,000
Less Opportunity Cost	-$80,000
Contribution from the Charter	**-$50,000**

        - Fracas Airlines should not accept the special order due to a negative contribution margin.

The process of decision making

- Common categories of investment alternatives
    - new investments to increase revenue
    - new technology to decrease costs
    - replacement of old assets as they wear out
- The investment alternatives available at any one time to an entity normally fit into one of these three categories
- Almost all entities make investments to decrease costs in today's environment of rapidly developing technology
- investments are made with the intent of making processes more effective and more efficient

Capital Budgeting

- **Capital budgeting**: The planning and financing of capital investments such as:
    - Replacement of Equipment
    - Enhancement of Production Facilities
    - Establishing a New Retail/Production Site

Important of Capital Budgeting

- Capital investments usually have the following characteristics.
    - High Cost (relative to the size of the entity)
    - Decision will extend well into the future.
    - Difficult to reverse decision.

Capital Budgeting Process

- Step One
    - Calculate the net annual cash flows.
        - 1. Estimate life of the project/asset.

        - 2. Estimate cash inflows for each year
            - Additional sales
            - Residual value
            - Cost savings
        - 3. Estimate cash outflows for each year
            - Cost of the project/asset
            - Higher wages, training costs, higher electricity cost
        - 4. Net Cash Flow = Inflow - Outflow
- Step Two
    - Apply one of the 2 evaluation techniques
        - The Payback Method
        - Net Present Value

The information for a decision making (example)

- New equipment cost $120,000
- Salvage value in 4 years time $60,000

Year	Expected net cash flows
1	$30,000
2	$60,000
3	$50,000
4	$40,000

- Raw material cost $200 per kg
  (Sometimes subject to 20% discount)
- Straight line depreciation

Payback period

- The **payback period** is the period of time necessary to recoup the initial outlay with net cash inflows
- To Calculate (assuming net cash flows are the same each year):
    - **Initial Cost of Investment = ? Years**
- **Net Annual Cash flows**

Year	Net cash flow $	Cumulative net cash flow $
0	-120,000	120,000
1	30,000	-90,000
2	60,000	-30,000
3	50,000	20,000
4	100,000	120,000

    - Payback occurs between years 2 and 3 (2.6 years)
- Entities invest in order to make profits. Investments normally require the outlay of cash and cash is important to entities that want to survive.
- Thus, the time it takes to recoup cash expended on investment is important.
- If two investments were potentially equally profitable, most entities would prefer the investment where the outlaid cash was recouped earlier.
- Decision rule for payback period
    - This varies between entities, but most have maximum periods beyond which they would not invest

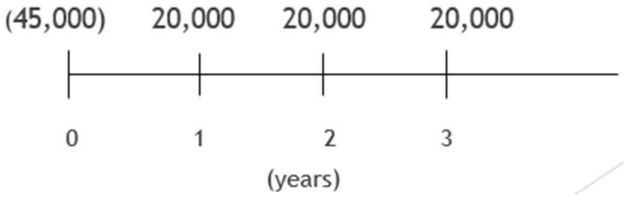
- The longer the payback period, the greater the risk, because there is a far greater chance that some of the assumptions on which the investment decision was made will change

Advantages	Disadvantages
Simple to calculate	Ignores all cash inflows after payback has occurred (so less-profitable short-term investments may get the nod !)
Easy to understand	Time value of money is ignored as it treats all cash inflows equally (PP is too simple to use as a decision tool by itself)
A crude measure of incorporating awareness of risk into the decision	

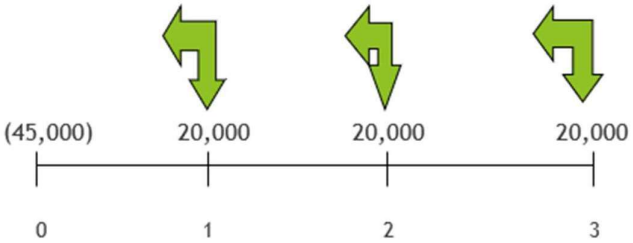
Net Present Value (NPV)

- To understand the Net Present Value concept, we first need to understand the concept of Time Value of Money

Time Value of Money

- Would you rather have $1,000 today or $1,000 in five years time?
  - Answer: _____
    - $1,000 can be invested today and if it earns 10% interest each year for the next 5 years it will accumulate to $1,610.
    - $1,000 today will also buy more than $1,000 in five years time.
- $1 today is worth more than $1 in the future because of two factors:
  - 1. Interest rates
  - 2. Inflation
- Would you invest $45,000 now if you were to receive a return of $20,000 every year for the next three years
- 

  - We cannot simply say:
    - Cash inflow
    - Less cost
    - Gain
  - Money has a time value. $20,000 in one years time is worth more than $20,000 in three years time.
- Cash flows in different years have different inherent values and therefore cannot be simply added together.
- We need to convert the annual cash flows into a common scale so that they can be added together. The common scale used is **Present Value**.
- Present value shows what a future amount is worth in today's dollars.
- For example, $500 in four years time is the equivalent of $367.51 today, assuming an interest rate of 8%.
- The present value of $500 in four years time is $367.51.



- In calculating present value we convert (discount) all the annual cash flows into today's dollars (i.e. what is $20,000 in two years time worth in today's dollars).

Present Value

- Lump Sum
  - If the interest rate is 10%, what is the PV of $161 received in five years time?

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  - Solution
    - **Present Value = Future Value / $(1 + i)^n$**
    - Present Value = $\frac{161}{(1.10)^5}$
    - Present Value = $100
- Annuity
  - Annity: Constant stream of cash flows (i.e. cash flow received each year of a projects life).
  - **PV = $\frac{FV1}{(1 + i)} + \frac{FV2}{(1 + i)^2} + \frac{FV3}{(1 + i)^3}$**
  - Practice Question 2
    - If the interest rate is 10%, how much would the government need to invest today to fund a road safety program costing $5m every year for the next three years?
    - PV1 = $\frac{5,000,000}{(1.1)^1}$ =4,545,454
    - PV2 = $\frac{5,000,000}{(1.1)^2}$ =4,132,231
    - PV3 = $\frac{5,000,000}{(1.1)^3}$ =3,756,574
    - PV =12,434,259

Discount Tables

- An alternative to using the formula and calculation method is to use discount tables
- Table 1 is used when only 1 cash flow need to be discounted and table 2 when a series of equal cash flow (annuity) need to be discounted.
- For period 1 and a 10 per cent discount rate, the table tells us that the discount factor is 0.909
- In our example, since 3 equal payments – therefore annuity (table 2)
- 3 payments – therefore period is 3; i is 10%;
- Therefore the discount rate is 2.4869

- Solution to Practice Question 2
  - PV = NCF (I, N)
  - PV = 5,000,000 (10%, 3)
  - PV = 5,000,000 x 2.4869
  - PV = $12,434,500 (rounding error)

Net Present Value (NPV)

- Step 1
  - Calculate the present value of the net annual cash flows.
- Step 2
  - Calculate the present value of the cost of the project/asset.
- Step 3
  - NPV = Answer to Step 1 – Answer to Step 2
- If NPV ≧ 0 : Project is acceptable
- The amount of any positive NPV represents the immediate increase in the entity's wealth that will result from accepting the project.

Advantages	Disadvantages
Takes into account all of the expected cash flows	the method relies on the use of an appropriate discount factor for the circumstances
the timing of expected cash flows (with cash flows received sooner being more beneficial to the entity)	the actual return in terms of the percentage of the investment outlay is not revealed
cash flows only, so is not subject to changing accounting rules and standards as profit figures are.	ranking of projects in terms of highest NPVs may not lead to optimum outcomes when capital is rationed
	in some cases, it conflicts with IRR rankings

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The information for a decision making (example)

- New equipment cost $120,000
- Salvage value in 4 years time $60,000

Year	Expected net cash flows
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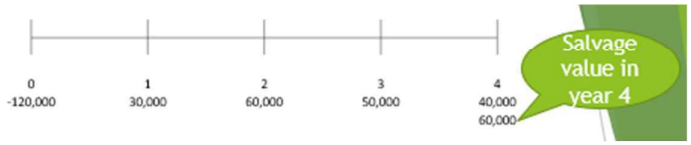
4	$40,000

- Assuming an interest rate of 10%
- Solution



  - $NPV = -120{,}000 + \frac{30{,}000}{(1+0.1)} + \frac{60{,}000}{(1+0.1)^2} + \frac{50{,}000}{(1+0.1)^3} + \frac{40{,}000}{(1+0.1)^4} + \frac{60{,}000}{(1+0.1)^4}$
  - NPV = -120,000 + 27,273 + 49,587 + 37,566 + 27,320 + 40,981
  - NPV = 62,727

    - Therefore, by accepting this project, the firm will have a net increase in wealth of $62,727.
- Using the discount table
    - NPV = -120,000 + 30,000 (10%,1) + 60,000 (10%,2) + 50,000 (10%,3) + 40,000 (10%,4) + 60,000 (10%,4)
    - NPV = -120,000 + 30,000 (0.9091) + 60,000 (0.8264) + 50,000 (0.7513) + 40,000 (0.6830) + 60,000 (0.6830)
    - NPV = 62,722 (slightly different from above due to rounding error)