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**ACCA Research Institute**



## ACCA F9

**Financial management**

**财务管理**

**ACCA Lecturer: Sinny Shao**





## Part D : investment appraisal

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## Lease or buy decision

**Leasing** is a contract between a lessor and a lessee for hire of a specific asset by the lessee from a manufacturer or vendor of such assets.

The **lessor** has ownership of the asset and so provides the initial finance for the asset.

The **lessee** has possession and use of the asset on payment of specified rentals over a period.

**Operating lease** is a lease where the lessor retains most of the risks and rewards of ownership.

**Finance lease** is a lease that transfers substantially all of the risks and rewards of ownership of an asset to the lessee

**Sale and leaseback** is when a business that owns an asset agrees to sell the asset to a financial institution and lease it back on terms specified in the sale and leaseback agreement.



## Lease or buy decision

### **Benefits of lease:**

- (a) The supplier of the equipment is paid in full at the beginning
- (b) The lessor invests finance by purchasing assets from suppliers and makes a return out of the lease payments from the lessee
- (c) Leasing may have advantages for the lessee:
  - (i) The lessee may not have enough cash to pay for the asset, and would have difficulty obtaining a bank loan to buy it.
  - (ii) Finance leasing may be cheaper than a bank loan.
  - (iii) The lessee may find the tax relief available advantageous.



## Lease or buy decision

### **Operating leases have further advantages:**

- (a) The leased equipment does not have to be shown in the lessee's published statement of financial position, and so the lessee's statement shows no increase in its gearing ratio.
- (b) The equipment is leased for a shorter period than its expected useful life. Especially for high-tech companies



## Lease or buy decision

### **Assumption:**

- 1) the preferred financing method should be the one with the lower PV of cost.
- 2) If the asset is purchased, it will be financed with a bank loan; therefore the cash flows are discounted at an after-tax cost of borrowing.

How to make decision?

We identify the least-cost financing option by comparing the cash flows of purchasing and leasing.



## Asset replacement decisions

**asset replacement decisions** means to assess when and how frequently an asset should be replaced.

the **equivalent annual cost method** can be used to calculate an optimum replacement cycle

**equivalent annual cost method:** the NPV of the cost of buying and using the asset over its life cycle is converted into an equivalent annual cost or annuity. This is a constant annual cost that is equal to the NPV of the costs over the asset life cycle. Usually 2 steps for calculation of equivalent annual cost



## Asset replacement decisions

**Step 1** Calculate the present value of costs for each replacement cycle over one cycle only

**Step 2** Turn the present value of costs for each replacement cycle into an equivalent annual cost

**The PV of cost over one replacement cycle**

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**The cumulative present value factor for the number of years in the cycle**





## Asset replacement decisions

### Equivalent annual benefit:

The equivalent annual benefit is the annual annuity with the same value as the net present value of an investment project.

$$\text{The equivalent annual annuity} = \frac{\text{NPV of project}}{\text{Annuity factor}}$$



## Asset replacement decisions

### Examples:

A company operates a machine which has the following costs and resale values over its four year life. Purchase cost: \$25,000

	Y1	Y2	Y3	Y4
Running costs	7500	11000	12500	15000
Resale value	15000	10000	7500	2500

The organization's cost of capital is 10%. You are required to assess how frequently the asset should be replaced.



# Asset replacement decisions

## Solution:

Step 1 Calculate the present value of costs for each replacement cycle over one cycle.

Year	Discount factors	Replace every year		Replace every 2 years		Replace every 3 years		Replace every 4 years	
		Cash flow \$	PV at 10% \$	Cash flow \$	PV at 10% \$	Cash flow \$	PV at 10% \$	Cash flow \$	PV at 10% \$
0	–	(25,000)	(25,000)	(25,000)	(25,000)	(25,000)	(25,000)	(25,000)	(25,000)
1	0.909	(7,500)	(6,818)	(7,500)	(6,818)	(7,500)	(6,818)	(7,500)	(6,818)
2	0.826	15,000	13,635	(11,000)	(9,086)	(11,000)	(9,086)	(11,000)	(9,086)
3	0.751			10,000	8,260	(12,500)	(9,388)	(12,500)	(9,388)
4	0.683					7,500	5,633	(15,000)	(10,245)
								2,500	1,708
PV of cost over one replacement cycle			<u>(18,183)</u>		<u>(32,644)</u>		<u>(44,659)</u>		<u>(58,829)</u>



## Asset replacement decisions

Step 2 Calculate the equivalent annual cost

Discount rate = 10%

(a) Replacement every year:

$$\text{Equivalent annual cost} = \$ (18,183) / 0.909 = \$ (20,003)$$

(b) Replacement every two years:

$$\text{Equivalent annual cost} = \$ (32,644) / 1.736 = \$ (18,804)$$

(c) Replacement every three years:

$$\text{Equivalent annual cost} = \$ (44,659) / 2.487 = \$ (17,957)$$

(d) Replacement every four years:

$$\text{Equivalent annual cost} = \$ (58,829) / 3.170 = \$ (18,558)$$

The optimum replacement policy is the one with the lowest equivalent annual cost



## Capital rationing

**Capital rationing:** a situation in which a company has a limited amount of capital to invest in potential projects, such that the different possible investments need to be compared with one another in order to allocate the capital available most effectively.

**Soft capital rationing:** is brought about by internal factors and decisions by management.

**Hard capital rationing:** is brought about by external factors, such as limited availability of new external finance.



## Capital rationing

**Soft capital rationing may arise for one of the following reasons.**

- (a) Management may be reluctant to issue additional share capital because of concern that this may lead to outsiders gaining control of the business.
- (b) Management may be unwilling to issue additional share capital if it will lead to a dilution of earnings per share.
- (c) Management may not want to raise additional debt capital because they do not wish to be committed to large fixed interest payments.
- (d) Management may wish to limit investment to a level that can be financed solely from retained earnings.



## Capital rationing

**Hard capital rationing may arise for one of the following reasons.**

- (a) Raising new finance through the stock market may not be possible if share prices are depressed.
- (b) There may be restrictions on bank lending due to government control.
- (c) Lending institutions may consider an organization to be too risky to be granted further loan facilities.
- (d) The costs associated with making small issues of capital may be too great.



## Capital rationing

When capital rationing occurs in a single period, projects are ranked in terms of profitability index. This is the ratio of the NPV of a project to its investment cost

### **further assumptions:**

- 1) If a company does not accept and undertake a project during the period of capital rationing, the opportunity to undertake it is lost
- 2) There is complete certainty about the outcome of each project, so that the choice between projects is not affected by considerations of risk.
- 3) Projects are divisible

**Single period rationing with non-divisible projects:** best way to deal with this situation is to use trial and error and test the NPV available from different combinations of projects





## Example

TS operates a fleet of vehicles and is considering whether to replace the vehicles on a 1, 2 or 3 year cycle. Each vehicle costs \$25,000. The operating costs per vehicle for each year and the resale value at the end of each year are as follows:

	Y1	Y2	Y3
Running costs	5000	8000	11000
Resale value	18000	15000	5000

The cost of capital is 6% per annum.

You should assume that the initial investment is incurred at the beginning of year 1 and that all other cash flows arise at the end of the year. What is equivalent annual cost of replacing the vehicles every 2 years?

- A \$11,743                      B \$12,812  
C \$13,511                      D \$15,666



Thank You!

