

# MANAGEMENT ACCOUNTING FOR DECISION MAKING

UNIT NO: F82J 35

## ***CAPITAL INVESTMENT APPRAISAL-Discounted Cash Flow Techniques - Net Present Value and Internal rate of Return***

### **Q 1 – Waverley Limited**

Waverley Limited are considering a capital investment opportunity. The project under consideration has a life of seven years at the end of which the assets have a negligible scrap value. £650,000 would have to be spent at the outset (year 0) to acquire fixed assets necessary for this project. You are given the following additional information relating to the project:

<u>Year</u>		<u>Cash Inflows</u>	<u>Cash Outflows</u>
		£	£
1	Cash flows	420,000	310,000
2	Cash flows	550,000	340,000
3	Cash flows	595,000	375,000
4	Cash flows	620,000	400,000
5	Cash flows	510,000	350,000
6	Cash flows	420,000	300,000
7	Cash flows	280,000	210,000

### **Required:**

- Calculate the net present value of the project
- Calculate the internal rate of return of the project
- Advise management whether or not to proceed with this project if the cost of capital for the business is 15%

**Q2 – Schouten BV**

Schouten BV are a manufacturing concern based in Rotterdam. They are considering the following proposal for capital investment. The project has a life of 6 years. Capital spending at the start (year 0) is estimated at €1,000,000. The following estimated have been made for future cash flows:

<u>Year</u>	<u>Cash Inflows</u>	<u>Cash Outflows</u>
	€	€
1	400,000	450,000
2	490,000	520,000
3	820,000	500,000
4	940,000	540,000
5	1,050,000	560,000
6	1,100,000	580,000

Required:

- Calculate the net present value of the project
- Calculate the internal rate of return of the project
- Advise management whether or not to proceed with this project if the cost of capital for the business is 9%

**Q3 – Larbert Manufacturing plc**

Larbert Manufacturing plc is considering investing in a new factory and producing a new product. The new product has a life cycle of 6 years after which it would be discontinued. Capital expenditure at the outset is estimated at £14,000,000 and the estimated future cash flows are as follows:

<u>Year</u>	<u>Cash Inflows</u>	<u>Cash Outflows</u>
	<u>£</u>	<u>£</u>
1	4,800,000	2,600,000
2	7,500,000	3,900,000
3	9,500,000	4,400,000
4	8,700,000	3,800,000
5	5,800,000	2,950,000
6	4,600,000	2,200,000

**Required:**

- (a) Calculate the net present value of the project
- (b) Calculate the internal rate of return of the project
- (c) Advise management whether or not to proceed with this project if the cost of capital for the business is 16%

**Q4 – Dartford & Inglewood plc**

You have been supplied with the following information by Dartford & Inglewood plc in relation to a possible new investment opportunity:

<u>Year</u>	<u>Cash Inflows</u>	<u>Cash Outflows</u>
	<u>£</u>	<u>£</u>
1	350,000	480,000
2	600,000	550,000
3	950,000	680,000
4	950,000	690,000
5	750,000	550,000

The cost of acquiring the necessary fixed assets for this project is £495,000 (in year 0). The cost of capital for this business is estimated at 7%.

**Required**

- Calculate the net present value of the project
- Calculate the internal rate of return of the project
- Advise management whether or not to proceed with this project
- Name two alternative methods of investment appraisal and state briefly their main advantages and disadvantages

**Q5 – Dawson plc**

Dawson plc is considering a proposed new investment project that involves the launch of a new product. The accountant has supplied you with the following information regarding the proposed new product:

Year 0 Initial Outlay:

Purchase of Fixed Assets      £250,000

Product Selling Price      £22.00      Per unit

Product Variable Costs      £14.00      Per unit

Share of existing fixed costs\*      £250,000      Per annum (includes depreciation £50,000)

New fixed costs\*      £120,000      Per annum (includes depreciation £40,000)

Projected sales:

Year 1      25,000      units

Year 2      35,000      units

Year 3      40,000      units

Year 4      40,000      units

Year 5      28,000      units

Year 6      18,000      units

Year 6

Scrap value of fixed assets      £10,000

Additional information:

Selling price inflation      2.80%      per annum

Cost price inflation      2.20%      per annum

Cost of Capital      12.0%      Per annum

\* the new product is expected to absorb a share of the existing fixed costs of the business.

**Required:**

Prepare a **capital investment appraisal** using **discounted cash flow techniques**.

Your answer should include calculations using:

- (a) Net Present Value, and
- (b) Internal Rate of Return

Prepare a short **report** to M Hill, Managing Director of Dawson plc explaining your findings. Your report should contain **recommendations** regarding this project.

Name two other methods of investment appraisal and discuss their relative advantages and disadvantages.

**Q6 – Baxter Limited**

The directors of Baxter Limited are considering the possibility of launching a new product with a life cycle of eight years. This project will involve a substantial investment in new fixed assets but funding can be arranged at a cost of 14%. The directors have been told that the project makes losses in the first two years and therefore are reluctant to commit funds to this project. They have now asked for your advice. You have established the following information regarding the proposed new product:

Year 0 Initial Outlay:

Purchase of Fixed Assets           £580,000

Product Selling Price               £36.00     Per unit

Product Variable Costs           £26.00     Per unit

Share of existing fixed costs\*   £440,000   Per annum (includes depreciation £90,000)

New fixed costs\*                   £195,000   Per annum (includes depreciation £70,000)

Projected sales:

Year 1                                 8,000 units

Year 2                                 12,000 units

Year 3                                 38,000 units

Year 4                                 52,000 units

Year 5                                 60,000 units

Year 6                                 45,000 units

Year 7                                 30,000 units

Year 8                                 15,000 units

Year 8:

Scrap value of fixed assets       £20,000

Additional information:

Selling price inflation             3.80% per annum

Cost price inflation                3.20% per annum

\* Fixed costs are charged to products and therefore the new product is expected to absorb a share of the existing fixed costs of the business

**Required:**

- a) Prepare a **capital investment appraisal** using **discounted cash flow techniques**. Your answer should include calculations using Net Present Value, and Internal Rate of Return.
- b) Prepare a short **report** to Sylvia Cuthbertson, Managing Director of Baxter Limited explaining your findings. Your report should contain **recommendations** regarding this project
- c) Name two other methods of investment appraisal and discuss their relative advantages and disadvantages.

### Assignment 7 – Gurdeep Singh Limited

Mr Singh's business is considering the launch of a new product, details are as follows:

	£
Initial capital expenditure on machinery	1,500,000
Working capital requirements	180,000
Project life	5 years
Estimated resale value of machinery at end of year 5	300,000
Recovery of working capital at end of year 5	180,000
Product selling price	38.00 per unit
Variable unit cost	32.00 per unit
Production/sales volume	
Year 1	165,000 units
Year 2	190,000 units
Year 3	215,000 units
Year 4	170,000 units
Year 5	90,000 units

In your calculations you should include the following:

**Allowance for inflation.** It is expected that selling prices will increase by 3% per annum (compound) and costs will increase by 4.5% per annum (compound).

**Capital Allowances.** Maximum capital allowances should be claimed

**Corporation Tax** – apply current year main corporation tax rate.

**Cost of capital.** The cost of capital for this business is 8%.

The initial capital expenditure and working capital requirements will be incurred at the beginning of the first year. All other receipts and payments will occur at the end of each year. The additional working capital does not qualify for capital allowances.

**Required:** Prepare a report for Mr Singh determining the viability of this project using both the NPV method and the IRR method of capital investment appraisal.

### Assignment 8 – Parry Limited

Parry Ltd is considering undertaking a new project details of which are as follows:

	£
Initial capital expenditure on machinery	850,000
Working capital requirements	110,000
Project life	5 years
Estimated resale value of machinery at end of year 5	100,000
Recovery of working capital at end of year 5	110,000
Product selling price	9.50 per unit
Variable unit costs	6.40 per unit
Production/sales volume	
Year 1	200,000 units
Year 2	240,000 units
Year 3	190,000 units
Year 4	150,000 units
Year 5	80,000 units

In your calculations you should include the following:

**Allowance for inflation.** It is expected that selling prices will increase by 4% per annum (compound) and costs will increase by 3.5% per annum (compound).

**Capital Allowances.** Maximum capital allowances should be claimed.

**Corporation Tax** – apply current year main corporation tax rate.

**Cost of capital.** The cost of capital for this business is 12%.

The initial capital expenditure and working capital requirements will be incurred at the beginning of the first year. All other receipts and payments will occur at the end of each year. The additional working capital does not qualify for capital allowances.

**Required:** Prepare a report for the management of Parry Ltd explaining whether or not this project is viable. Use both the NPV & the IRR methods of capital investment appraisal.

### Assignment 9 – Gibson Limited

Gibson Ltd is considering undertaking a new project details of which are as follows:

	£
Cost of new machinery	900,000
Working capital requirements	140,000
Project life	5 years
Estimated resale value of machinery at end of year 5	200,000
Recovery of working capital at end of year 5	140,000
Product selling price	5.50 per unit
Variable unit costs	3.90 per unit
Share of existing fixed costs	£150,000 per annum (includes depreciation £40,000)
New fixed costs	£100,000 per annum (includes depreciation £70,000)
Production/sales volume	
Year 1	250,000 units
Year 2	220,000 units
Year 3	180,000 units
Year 4	140,000 units
Year 5	90,000 units

In your calculations you should include the following:

**Allowance for inflation.** It is expected that selling prices will increase by 6% per annum (compound) and costs will increase by 8% per annum (compound).

**Corporation Tax** – apply current year main corporation tax rate.

**Capital Allowances.** Maximum capital allowances should be claimed.

**Assume half of the Annual Investment Allowance has been used already.**

**Cost of capital.** The cost of capital for this business is 16%.

The initial capital expenditure and working capital requirements will be incurred at the beginning of the first year. All other receipts and payments will occur at the end of each year. The additional working capital does not qualify for capital allowances.

**Required:**

Prepare a report for the management of Gibson Ltd explaining whether or not this project is viable. Use both the NPV & the IRR methods of capital investment appraisal.

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### Assignment 10 – Paterson Limited

Hilary Dawson, the managing director of Paterson Ltd has asked for your advice regarding the feasibility of a new project. She has given you the undernoted information regarding the project and has asked you to prepare a brief report regarding its feasibility. The cost of capital for Paterson Limited is 15%.

The new project will require capital expenditure of £880,000 at the outset, along with an additional requirement of £300,000 for working capital. The estimated resale value of fixed assets at the end of the project – at the end of year 6 – is £200,000. It is expected that all working capital will also be recovered at the end of year 6.

The new product will have a selling price of £15.00 and the variable unit cost of the product is estimated at £8.50. Allowances should be made for inflation of 5% per annum (compound) on selling price and 4.5% per annum (compound) on costs. (Note – depreciation has been excluded from costs)

The new product will have a share of the fixed costs of £120,000 per annum excluding depreciation and there will be new fixed costs for the new product of £80,000 excluding depreciation.

Production and sales volumes are estimated as follows:

Year 1	50,000	units
Year 2	65,000	units
Year 3	65,000	units
Year 4	90,000	units
Year 5	70,000	units
Year 6	45,000	units

Maximum capital allowances should be claimed. **However, only £100K of the Annual Investment Allowance is left to use on this project.**

Apply current year main corporation tax rate.

The initial capital expenditure and working capital requirements will be incurred at the beginning of the first year. All other receipts and payments will occur at the end of each year. The additional working capital does not qualify for capital allowances.

#### Required:

Prepare a report for the management of Paterson Ltd explaining whether or not this project is viable. Use both the NPV & the IRR methods of capital investment appraisal.

### Assignment 11 – Caird Limited

Faisal Aswan is the managing director of Caird Ltd and he has requested your advice regarding the feasibility of a new investment opportunity. He has supplied you with the information below regarding the project and has asked you to prepare a brief report regarding its feasibility. The cost of capital for Caird Limited is 8%.

Details relating to the investment opportunity:

#### Expenditure at the outset:

Expenditure on fixed assets	£450,000
Working capital requirement	£175,000
Period of the project	6 years

#### Income at the end of the project

Estimated resale value of fixed assets	£75,000 at end of year 6
Working capital recovered at the end of year 6	£175,000

#### Other Information:

Selling Price of new product	£2.20
Variable unit costs of new product	£1.30

#### Estimated production and sales volumes:

Year 1	130,000	units
Year 2	150,000	units
Year 3	180,000	units
Year 4	220,000	units
Year 5	160,000	units
Year 6	80,000	units

Other factors to be incorporated into your capital investment appraisal are:

- Maximum capital allowances should be claimed **but you should note that the Annual Investment Allowance has already been used**
- An appropriate balancing allowance can be claimed at the end of the project
- Corporation Tax – apply current year main corporation tax rate.
- Allowances should be made for inflation of 3% per annum (compound) on both selling prices and on costs.

The initial capital expenditure and working capital requirements will be incurred at the beginning of the first year. All other receipts and payments will occur at the end of each year. The additional working capital does not qualify for capital allowances.

**Required:**

Prepare a report for the management of Caird Ltd explaining whether or not this project is viable. Use both the NPV & the IRR methods of capital investment appraisal.

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