
Investment appraisal

2017-18

OBJECTIVE

- ▶ criteria to choose among projects

INVESTMENT APPRAISAL

- ▶ *Investment*:
 - ▶ purchase of capital goods
 - ▶ expenditure by business expecting to yield a future return
- ▶ *Investment appraisal*: objective evaluation of investment project
 - compare *capital cost* of project with *net cash flow*
 - ▶ *capital cost*: money spent when setting up new venture
 - ▶ *net cash flow*: *cash inflows* minus *cash outflows*

SIMPLE PAYBACK

- ▶ *Payback period*: amount of time it takes for a project to recover or pay back the initial outlay
- ▶ Payback period can also be found by calculating the *cumulative net cash flow*

year 0 :	–	500 000	initial investment
year 1 :	+	100 000	cash flow
year 2 :	+	125 000	cash flow
year 3 :	+	125 000	cash flow
year 4 :	+	150 000	cash flow

Table 2 Expected net cash flow from some new cutting machinery

	£000					
	Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
Net cash flow	(500)	100	125	125	150	150
Cumulative net cash flow	(500)	(400)	(275)	(150)	0	150

WORKED EXAMPLE

Table 3 Expected net cash flow from three projects

	£000								
	Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Total net cash flow	Payback period
A Net cash flow	(70)	10	10	20	20	30	40	60	4 yrs 4 mths
A Cumulative cash flow	(70)	(60)	(50)	(30)	(10)	20	60		
B Net cash flow	(70)	20	20	20	20	20	20	50	3 yrs 6 mths
B Cumulative cash flow	(70)	(50)	(30)	(10)	10	30	50		
C Net cash flow	(70)	30	30	20	10	10	10	40	2 yrs 6 mths
C Cumulative cash flow	(70)	(40)	(10)	10	20	30	40		

ADVANTAGES OF THE PAYBACK METHOD

- ▶ *rapid technological change*: recover cost of investment before new model/equipment is designed
- ▶ *simple* to use
- ▶ *cash-flow problems*: chosen project will *payback* investment faster

AVERAGE (ACCOUNTING) RATE OF RETURN (ARR)

$$\text{ARR (\%)} = \frac{\text{net return (profit) per annum}}{\text{capital outlay (cost)}} \times 100$$

WORKED EXAMPLE

Table 5 The capital cost and net cash flow from three investment projects

	Project X	Project Y	Project Z
Capital cost	£50,000	£40,000	£90,000
Return Yr 1	£10,000	£10,000	£20,000
Yr 2	£10,000	£10,000	£20,000
Yr 3	£15,000	£10,000	£30,000
Yr 4	£15,000	£15,000	£30,000
Yr 5	£20,000	£15,000	£30,000
Total net cash flows	£70,000	£60,000	£130,000

WORKED EXAMPLE

Table 6 The ARR calculated for three investment projects

	Project X	Project Y	Project Z
Capital cost	£50,000	£40,000	£90,000
Total net profit (net cash flow – capital cost)	£20,000	£20,000	£40,000
Net profit p.a. (profit ÷ 5)	£4,000	£4,000	£8,000
ARR	8%	10%	8.9%

ADVANTAGES OF THE ARR METHOD

- ▶ shows the *profitability* of an investment project
- ▶ *comparability*

DISCOUNTED CASH FLOW (NET PRESENT VALUE OR NPV)

- ▶ *present value* of future cash flow or future profit earned
- ▶ Value of 100 invested over 5 years at 10% per annum compound interest:
 - ▶ in *one* year: $100 \times (1 + 0.1) = 110$
 - ▶ in *two* years: $110 \times (1 + 0.1) = 121$

Table 8 Value of £100 invested over five years at 10 per cent per annum compound interest

Year	1	2	3	4	5
Value of £100	£110	£121	£133	£146	£161

DISCOUNTED CASH FLOW

DISCOUNT TABLES

discount tables: shows by how much a *future value* must be multiplied to calculate its *present value*

Table 9 Discount table

Year	Rate of discount				
	5%	10%	15%	20%	25%
0	1.00	1.00	1.00	1.00	1.00
1	0.95	0.91	0.87	0.83	0.80
2	0.91	0.83	0.76	0.69	0.64
3	0.86	0.75	0.66	0.58	0.51
4	0.82	0.68	0.57	0.48	0.41
5	0.78	0.62	0.50	0.40	0.33
6	0.75	0.56	0.43	0.33	0.26
7	0.71	0.51	0.38	0.28	0.21
8	0.68	0.47	0.33	0.23	0.17
9	0.64	0.42	0.28	0.19	0.13
10	0.61	0.39	0.25	0.16	0.11

Table 10 Net present value of three investment projects discounted at 20 per cent

Year	Project A		Project B		Project C		Discount table Rate of discount at 20%
	Net cash flow £	Present value £	Net cash flow £	Present value £	Net cash flow £	Present value £	
0	(50,000)	(50,000)	(50,000)	(50,000)	(50,000)	(50,000)	1.00
1	10,000	8,300	5,000	4,150	20,000	16,600	0.83
2	10,000	6,900	8,000	5,520	16,000	11,040	0.69
3	10,000	5,800	10,000	5,800	14,000	8,120	0.58
4	10,000	4,800	12,000	5,760	12,000	5,760	0.48
5	10,000	4,000	12,000	4,800	12,000	4,800	0.40
6	10,000	3,300	12,000	3,960	12,000	3,960	0.33
7	10,000	2,800	12,000	3,360	12,000	3,360	0.28
8	10,000	2,300	14,000	3,220	10,000	2,300	0.23
9	10,000	1,900	16,000	3,040	8,000	1,520	0.19
10	10,000	1,600	20,000	3,200	5,000	800	0.16
Total net cash flow before discounting	50,000		71,000		71,000		
Present values years 1–10		41,700		42,810		£58,260	
Net present value (NPV)		(8,300)		(7,190)		+8,260	

ADVANTAGES OF THE DISCOUNTED CASH-FLOW METHOD

LIMITATIONS OF THESE TECHNIQUES

Table 11 Limitations of the methods of investment

Appraisal method	Limitations
Simple payback	Cash earned after the payback period is ignored The profitability of the method is overlooked
Average rate of return	The effects of time on the value of money are ignored
Discounted cash flow	The calculation is more complex than the other methods The rate of discount is critical – if it is high, fewer projects will be profitable

KEY TERMS

- ▶ **Average rate of return or accounting rate of return (ARR):** a method of investment appraisal that measures the net return per annum as a percentage of the initial spending
- ▶ **Capital cost:** the amount of money spent when setting up a new venture
- ▶ **Discounted cash flow (DCF):** a method of investment appraisal that takes interest rates into account by calculating the present value of future income
- ▶ **Investment:** the purchase of capital goods
- ▶ **Investment appraisal:** the evaluation of an investment project to determine whether or not it is likely to be worthwhile

KEY TERMS

- ▶ **Net cash flow:** cash inflows minus cash outflows
- ▶ **Net present value (NPV):** the present value of future income from an investment project, minus the cost
- ▶ **Payback period:** the amount of time it takes to recover the cost of an investment project
- ▶ **Present value:** the value today of a sum of money available in the future

KEY TERMS

REVISION OF CHAPTER 17

- ▶ **Bonus:** A payment in addition to the basic wage for reaching targets or in recognition for service
- ▶ **Commission:** Percentage payment on a sale made to the salesperson
- ▶ **Consultation:** Listening to the views of employees before making key decisions that affect them
- ▶ **Delegation:** The passing of authority further down the managerial hierarchy
- ▶ **Empowerment:** Giving official authority to employees to make decisions and control their own work activities
- ▶ **Hawthorne effect:** The idea that workers are motivated by recognition given to them as a group

KEY TERMS

REVISION OF CHAPTER 17

- ▶ **Hygiene or maintenance factors (Herzberg's):** Things at work that result in dissatisfaction
- ▶ **Job enlargement:** Giving an employee more work to do of a similar nature; 'horizontally' extending their work role
- ▶ **Job enrichment:** Giving employees greater responsibility and recognition by 'vertically' extending their work role
- ▶ **Job rotation:** The periodic changing of jobs or tasks
- ▶ **Maslow's hierarchy of needs:** The order of people's needs starting with basic human requirements
- ▶ **Motivated:** The desire to take action to achieve a goal

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- ▶ **Motivators (Herzberg's):** Things at work that result in satisfaction
- ▶ **Payment by results:** Payment methods that reward workers for the quantity and quality of work they produce
- ▶ **Performance-related pay (PRP):** A payment system designed for non-manual workers where pay increases are given if performance targets are met
- ▶ **Piece rates:** A payment system where employees are paid an agreed rate for every item produced

KEY TERMS

REVISION OF CHAPTER 17

- ▶ **Profit sharing:** Where workers are given a share of the profits, usually as part of their pay
- ▶ **Scientific management:** A theory that suggests there is a 'best way' to perform work tasks
- ▶ **Self-actualisation:** A level in Maslow's hierarchy where people realise their full potential
- ▶ **Teamworking:** Organising people into working groups that have a common aim

KEY TERMS

REVISION OF CHAPTER 18

- ▶ **Autocratic leadership:** A leadership style where a manager makes all the decisions without consultation
- ▶ **Democratic leadership:** A leadership style where managers allow others to participate in decision making
- ▶ **Laissez-faire leadership:** A leadership style where employees are encouraged to make their own decisions, within certain limits
- ▶ **Paternalistic leadership:** A leadership style where the leader makes decisions but takes into account the welfare of employees