

# ACCAspace

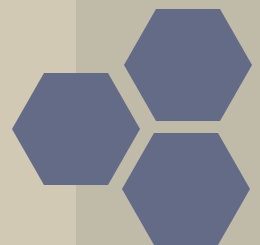
**Provided by**  
**ACCA Research Institute**

## ACCA F9

**Financial Management**

**财务管理**

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## Part D investment appraisal

1

Investment decisions without DCF

2

Investment decisions with DCF

3

Payback period





## IRR & adjusted payback period

Internal rate of return (IRR) of an investment is the cost of capital at which its NPV would be exactly \$0.

3 steps to estimate IRR :

- ❑ Calculate the net present value using the company's cost of capital
- ❑ Having calculated the NPV using the company's cost of capital, calculate the NPV using a second discount rate.
- ❑ Use the two NPV values to estimate the IRR

$$\text{IRR} \approx a + \left( \left( \frac{\text{NPV}_a}{\text{NPV}_a - \text{NPV}_b} \right) (b - a) \right) \%$$





# IRR & adjusted payback period

为什么说我们算出的IRR是估计出来的？

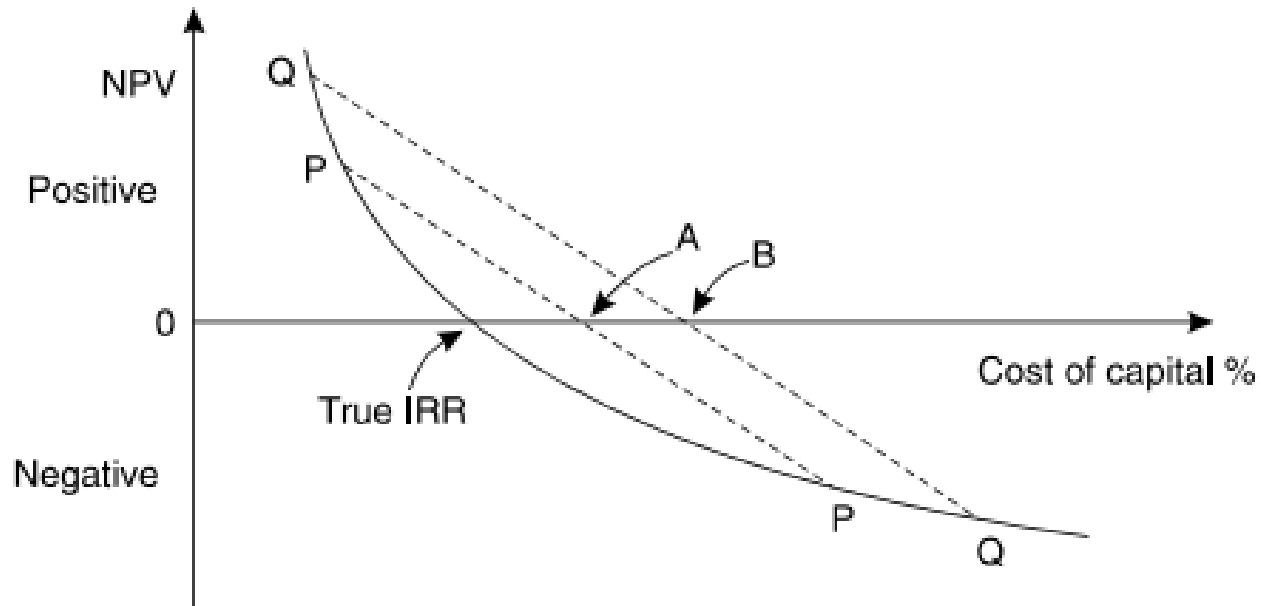


Figure 2





## IRR & adjusted payback period

### Example:

Find the IRR of the project given below and state whether the project should be accepted if the company requires a minimum return of 17%.

Y0	( 4000 )
Y1	1200
Y2	1410
Y3	1875
Y4	1150





## IRR & adjusted payback period

time	cash flow	discount @17%	PV	discount @14%	PV
0	-4000	1.000	-4000	1.000	-4000
1	1200	0.855	1026	0.877	1052
2	1410	0.731	1031	0.769	1084
3	1875	0.624	1170	0.675	1266
4	1150	0.534	614	0.592	681
			-159		83

The IRR must be less than 17%, but higher than 14%. The NPVs at these two costs of capital will be used to estimate the IRR.

$$\text{IRR} = 14\% + \left[ \frac{83}{83+159} \times (17\% - 14\%) \right] = 15.03\%$$

The project should be rejected as the IRR is less than the minimum return demanded.





### The advantage and disadvantage of IRR

Advantage:

- ❑ the information it provides is more easily understood by managers, especially non-financial managers
- ❑ The IRR method ignores the relative size of investments

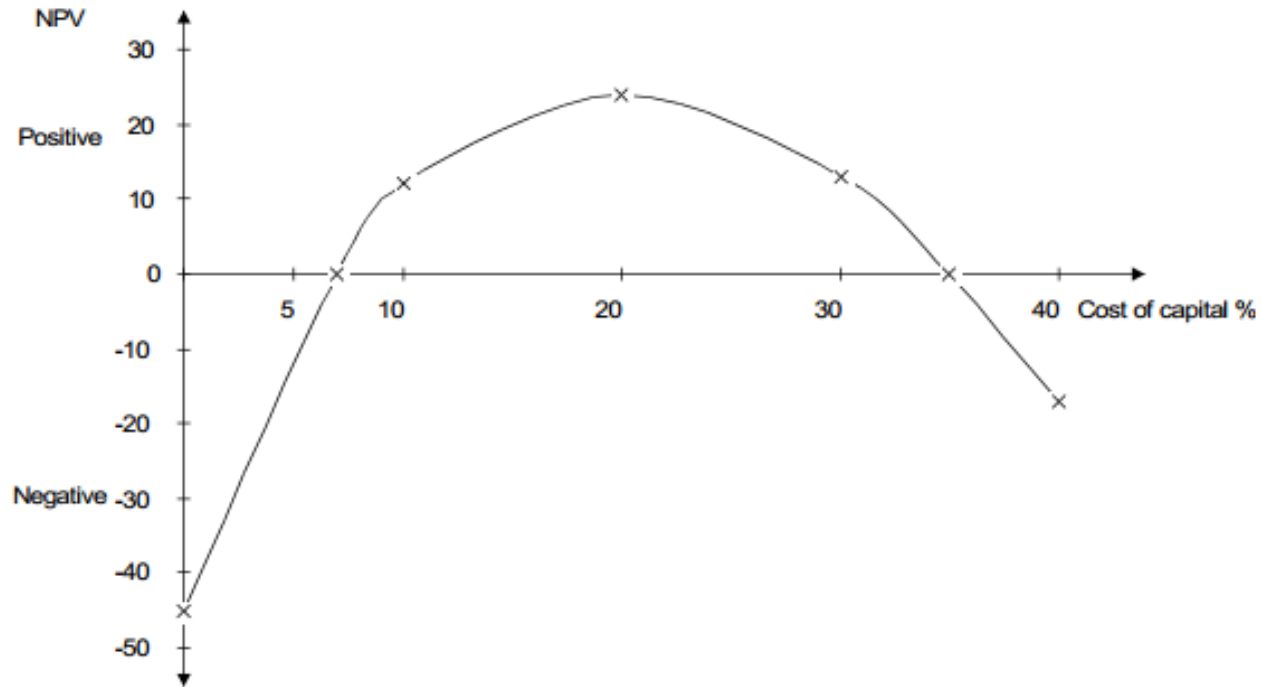




# IRR & adjusted payback period

## Disadvantage:

For project has non-conventional cash flows, they may get 2 IRR







## IRR & adjusted payback period

### NPV VS IRR

- (a) When cash flow patterns are conventional both methods gives the same accept or reject decision.
- (b) The IRR method is more easily understood.
- (c) NPV is technically superior to IRR and simpler to calculate.
- (d) IRR and accounting ROCE can be confused.
- (e) IRR ignores the relative sizes of investments.
- (f) Where cash flow patterns are non-conventional, there may be several IRRs which decision makers must be aware of to avoid making the wrong decision.





## IRR & adjusted payback period

- (g) The NPV method is superior for ranking mutually exclusive projects in order of attractiveness.
- (h) The reinvestment assumption underlying the IRR method cannot be substantiated.
- (i) When discount rates are expected to differ over the life of the project, such variations can be incorporated easily into NPV calculations, but not into IRR calculations.
- (j) Despite the advantages of the NPV method over the IRR method, the IRR method is widely used in practice.





## IRR & adjusted payback period

For a certain project, the net present value at a discount rate of 15% is \$3,670, and at a rate of 18% the net present value is negative at (\$1,390). What is the internal rate of return of the project?

- A 15.7%
- B 16.5%
- C 16.6%
- D 17.2%





## IRR & adjusted payback period

### Adjusted payback period

Year	cash flow	accumulated cash flow	discount factor@10%	PV	accumulated NPV
0	(100,000)	(100,000)	1.000	(100,000)	(100,000)
1	30,000	(70,000)	0.909	27,270	(72,730)
2	50,000	(20,000)	0.826	41,318	(31,412)
3	40,000	20,000	0.751	30,050	(1,362)
4	30,000	50,000	0.683	20,488	19,126
5	20,000	70,000	0.621	12,417	31,543





# IRR & adjusted payback period

## Advantages and disadvantages of DCF

### Advantage:

- ◆ Taking account of the time value of money
- ◆ The method uses all relevant cash flows relating to the project
- ◆ It allows for the timing of the cash flows
- ◆ There are universally accepted methods of calculating the NPV & IRR

### Disadvantage:

- DCF methods use future cash flows that may be difficult to forecast.
- The basic decision rule, accept all projects with a positive NPV, will not apply when the capital available for investment is rationed.
- The cost of capital used in DCF calculations may be difficult to estimate.
- The cost of capital may change over the life of the investment.





Thank You!

