



Investment appraisal (Payback and ARR) - Syngenta

There are three broad motives for capital investment:

- renewal of worn out assets
- acquisition of additional assets to expand the business and increase output
- innovation to reduce costs and/or to create new value.

Syngenta is one of the world’s leading suppliers of seeds and crop protection systems. In 2008 Syngenta proposed an investment in new manufacturing capacity that would allow it to increase its production of Amistar, the world’s leading fungicide. As the Amistar range moved through its product life cycle, maximum capacity was approached. Syngenta could not produce more Amistar without investing in its production facilities. A proposal was put forward to expand production through an £150 million investment at the Grangemouth site in Scotland. To make an informed decision, Syngenta had to carry out an investment appraisal. This involves determining whether the inflows represent a sufficient return on the original investment.

Projected cash flows - An investment – or capital expenditure – involves a cash outflow in the present that is expected to yield greater cash inflow in the future. Managers need to produce the best available financial estimates of inflows and outflows that would result from the investment.

Table 1: Estimated cash flows for Syngenta’s Grangemouth expansion project

Cash flows (£ million)										
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9
<i>Cash inflow</i>										
Sales		200	400	400	400	400	400	400	400	400
Total inflow		200	400	400	400	400	400	400	400	400
<i>Cash outflow</i>										
Investment	150									
Manufacturing costs		80	160	160	160	160	160	160	160	160
Sales and marketing		15	30	30	30	30	30	30	30	30
Other costs		25	25							
Total outflow	150	120	215	190	190	190	190	190	190	190
Net cash flow	(150)	80	185	210	210	210	210	210	210	210

Payback

Table 1 shows estimates cash flows for the Grangemouth expansion project. The simplest method of investment appraisal is to calculate the **payback** period. This is the length of time it takes for the earnings associated with an investment project to cover the initial outlay. In other words, it is when the cumulative earnings equal the original cost of the investment. This is an application of the **break-even** principle. As Table 1 shows, the Grangemouth expansion is expected to achieve payback during Year 2. By the end of Year 2 there would be cumulative earnings of £265m (80 +185), considerably more than the £150m initial outlay. The exact payback period is easily calculated by interpolation. Payback is achieved when £70m is earned during Year 2, as when this is added to the £80m earned in Year 1 cumulative earnings equal £150m. It follows that payback will be achieved in Year 2 after:

$$(70/185) \times 12 = 4.5 \text{ months}$$

The payback period is thus projected at **1 year 4½ months**. This is a relatively short payback period. It is a useful pointer, but does not reflect the true value of the investment.



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Average rate of return (ARR)

The payback figure provides no information about the cash flows *after* payback and gives no indication of overall profitability. To do this, it is usual to calculate the **average rate of return (ARR)**. This is expressed as a percentage of the sum invested. To calculate the ARR for the Grangemouth expansion project, it is necessary to aggregate all outflows and inflows over the life of the project using the data in Table 1.

Total outflows £1,815m
Total inflows £3,400m
Net cash flow £1,585m

This allows the net cash flow to be calculated. This is:

$$£3,400m - £1,815m = \mathbf{£1,585m}$$

This value can then be divided by the number of years of the project's projected life to get an annual rate of return:

$$£1,585 / 9 = \mathbf{£176.1m}$$

Finally this average value can be expressed as a percentage of the original investment:

$$(£176.1m / £150) \times 100 = \mathbf{117.4\%}$$

This is an extremely good rate of return. It is usual to compare this against the opportunity cost. This is the return that could be achieved by investing the £150m in another activity. For example, it might be considered more prudent to keep the money in the bank as cash reserves. However, bank interest rates are rarely more than 10%, far less than the 117% returns expected from this project. There is one major drawback to an analysis based on annual average rates of returns. Unfortunately, ARR takes no account of the *timing* of cash flows.

Questions

1. What is meant by investment appraisal?
2. Describe the three main reasons for capital investment
3. What are the advantages and disadvantages of using Payback as an investment appraisal technique?
4. What are the advantages and disadvantages of using Average Annual Rate of Return as an investment appraisal technique?
5. An organisation is considering an investment opportunity. The initial cost would be £75 million and the project is expected to have a useful life of 5 years.

The expected net returns each year are as follows:

Year	Net return (£m)
1	35
2	60
3	65
4	60
5	45

- a) Calculate the Payback period and Average Annual Rate of Return for the project.
- b) Do you think it is a worthwhile investment?
- c) What other factors might the business need to take into account before making a final decision?