



## Investment appraisal (NPV) - 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.

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### **Discounted cash flows**

This problem is tackled using discounted cash flows. This is a method of determining what *future* cash inflows are actually worth today. This depends on the opportunity cost of money. One way of putting a value on the opportunity cost of money is to use interest rates. This is what could be earned by simply keeping the money in a bank account gaining interest. Suppose interest rates for the next year are estimated to be 10% on average. Then, in a year's time an investment of £1 would be worth:

$$£1 \times (110/100) = \mathbf{£1.10}$$

Put another way, £1.10 in a year's time is worth £1 today. A formula can similarly be applied to find out what any sum in the future would be worth today. Assuming opportunity costs of 10%, a £1 in one year's time is worth:

$$£1 \times (100/110) = \mathbf{£0.91}$$

And £1.00 in two years' time is worth:

$$£1 \times (100/110) \times (100/110) = \mathbf{£0.83}$$

This sequence can be extended for years into the future producing factors that can be used to convert future cash flows into their present values (PV). For example, with a discounting rate of 10%, the discount factor is 100/110 or 0.91 applied to the value of a sum received after one year; for two years it is (100/110)<sup>2</sup> or 0.83; for three years it is (100/110)<sup>3</sup> or 0.75. Table 2 shows factors for discount rates of 10% and 20%.



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Table 2: Discount rate factors for Syngenta's Grangemouth expansion project

Discount factor	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9
10%	1.00	0.91	0.83	0.75	0.68	0.62	0.56	0.51	0.47	0.42
20%	1.00	0.83	0.69	0.58	0.48	0.40	0.34	0.28	0.23	0.19

We can now look again at the Grangemouth expansion project and calculate the expected return on a discounted cash flow basis. Typically, a company such as Syngenta uses a discount rate that reflects the minimum return expected on capital employed. This is likely to be a good deal higher than average interest rates.

Table 3: Discounted cash flows for Syngenta's Grangemouth expansion project

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9
Net cash flow £m	(150)	80.0	185.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0
Discount factor	1.00	0.83	0.69	0.58	0.48	0.40	0.34	0.28	0.23	0.19
DCF £m	(150)	66.4	127.7	121.8	100.8	84.0	71.4	58.8	48.3	39.9

Table 3 shows the discount cash flow for the Grangemouth project using a discount factor of 20%. Again this is an illustrative data to show the basic principles of the method. The present value of all the projected cash flows can be aggregated to give the net present value (NPV) for the whole project. In this illustrative example, the net present value is £569.1m. If this value is positive, then the project is expected to achieve earnings with a value greater than the opportunity cost of the funds committed.

### 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 Discounted Cash Flows (Net Present Value) as an investment appraisal technique?
4. A firm 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)
0	(75)
1	35
2	60
3	65
4	60
5	45

- a) Calculate the Net Present Value for the project using the 20% discount factors in table 2.
- 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?