

EXERCISE 2

We would like to know if we are able to tender for a project of a school construction. We have already calculated our estimated costs. The information that we have is as follows:

Estimated cost of works: £1.2 million

Duration: 12 months

Expected profit: 8%

Retention: 5%

Payments: 1 month after valuation

Interest for credit: 7% (locked-up capital completely supplied by the bank)

Month	Cost
1	£20,000
2	£50,000
3	£100,000
4	£130,000
5	£150,000
6	£180,000
7	£140,000
8	£130,000
9	£120,000
10	£100,000
11	£50,000
12	£30,000

We would like to know if this project will be profitable or not. Analyse it and explain your conclusions with a cashflow diagram.

SOLUTIONS

We calculate cash-in according to the payments to receive. This payments will be:

Cost of works + benefit – retention

These payments are delayed one month. This way, we calculate the estimation of cash-flow at the end of each month:

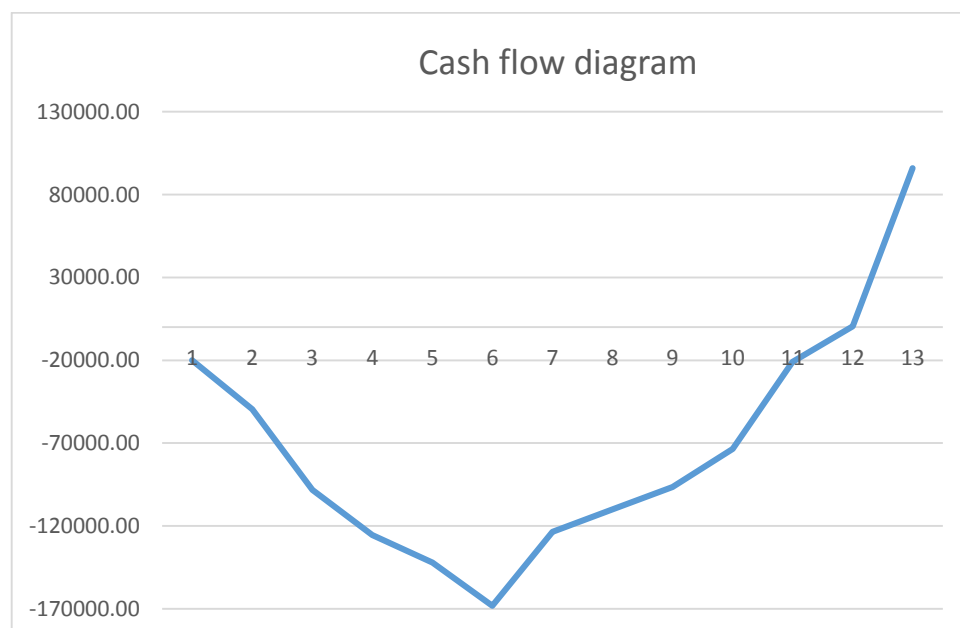
Month	Cash in	Cash out	Cash flow
1		20000.00	-20000.00
2	20520.00	50000.00	-49480.00
3	51300.00	100000.00	-98180.00
4	102600.00	130000.00	-125580.00
5	133380.00	150000.00	-142200.00
6	153900.00	180000.00	-168300.00
7	184680.00	140000.00	-123620.00
8	143640.00	130000.00	-109980.00
9	133380.00	120000.00	-96600.00
10	123120.00	100000.00	-73480.00
11	102600.00	50000.00	-20880.00
12	51300.00	30000.00	420.00
	95580		96000.00

Where:

Cash flow = Previous cash-flow + cash-in – cash-out

The negative cash flow is locked-up capital. It is the capital that is blocked for these works. This locked-up capital varies every month according to cash-in and cash-out.

We can draw a chart as follows, showing the maximum locked-up capital and its evolution. When this money becomes positive, it changes to benefit and we don't need any locked-up capital.



If we are using this locked-up capital from a bank, we need to pay interest for it. The interest used (7%) is annually, so we need to change it to monthly.

$$0.07/12 = 0.00583333$$

To calculate this interest cost, we can use it as simple or composed (cumulative) interest. It depends on if we pay this interest at the end of every month or accumulate it to the end, in this case we will pay “interest for the interest”.

Simple interest

$$TOTAL\ INTEREST = \sum_{i=0}^{i=n} x_i \times \frac{INT}{12}$$

Where:

x_i = locked-up capital every month

i = number of months with locked-up capital

INT = annual interest

Cumulative interest

The estimation of the cumulative interest should be calculated per month to obtain an accurate result, as the locked-up capital varies. In order to get an approximate result, we can make an average with the locked-up capital per month and calculate a cumulative interest of it.

$$TOTAL\ INTEREST = \frac{\sum_{i=0}^{i=n} x_i}{n} \left(\left(1 + \frac{INT}{12} \right)^n - 1 \right)$$

If we calculate simple interest, the result is £5998.42

If we calculate cumulative interest, the result is £6176.47

As you can see, the difference is not much because the time is not much either.

If we subtract this interest, we can see that the final benefit is around £90,000 (with no investment).