## **Profitability Index**

Profitability index is calculated as:

 $PI = \frac{NPV(\text{future cash flows excluding the initial investment})}{\text{Initial investment at time zero}}$ 

Projects are accepted if their profitability index is more than one. The bigger the profitability index the better.

The profitability index is simple to understand, but since it's a proportional measure, not a dollar value measure, it suffers from the same scale effect problem as the internal rate of return (IRR) method.

## **Calculation Example: Profitability Index**

**Question:** A mining firm's potential new gold mine has the following after-tax cash flows:

- \$9m outflow to buy extra machinery needed to excavate the mine which will be delivered and paid for immediately (t=0).
- \$6m inflow in one year (t=1) from gold sales.
- \$5m inflow in two years (t=2) from gold sales.

The discount rate is 10% pa given as an effective annual rate. What is the profitability index? **Answer:** Remember that an investment is a cash outflow, just the same as a cost. So a positive investment is a negative cash flow:

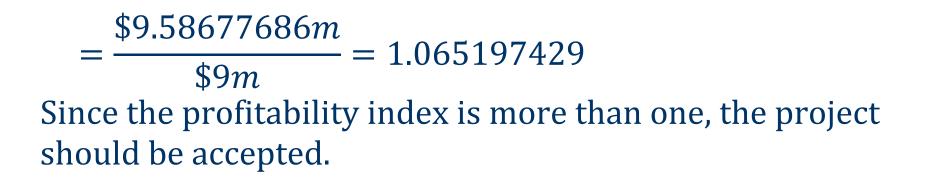
*Initial investment*  $= -(C_0) = -(-9m) = \$9m$ 

NPV(future cash flows excluding the initial investment)

$$= \frac{C_1}{(1+r)^1} + \frac{C_2}{(1+r)^2}$$
$$= \frac{6m}{(1+0.1)^1} + \frac{5m}{(1+0.1)^2}$$
$$= \$9.58677686m$$
NPV(future cash flows exclu

PI =

ure cash flows excluding the initial investment) Initial investment at time zero



## **Questions: Profitability index**

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