What is 'Net Present Value - NPV'

Net Present Value (NPV) is the difference between the present value of cash inflows and the present value of cash outflows. NPV is used in [capital budgeting](http://www.investopedia.com/terms/c/capitalbudgeting.asp) to analyze the profitability of a projected [investment](http://www.investopedia.com/terms/i/investment.asp) or project.

The following is the formula for calculating NPV:

where

Ct = net cash inflow during the period t

Co= total initial investment costs

r = [discount rate](http://www.investopedia.com/terms/d/discountrate.asp), and

t = number of time periods

A positive net present value indicates that the projected [earnings](http://www.investopedia.com/terms/e/earnings.asp) generated by a project or investment (in present dollars) exceeds the anticipated costs (also in present dollars). Generally, an investment with a positive NPV will be a profitable one and one with a negative NPV will result in a [net loss](http://www.investopedia.com/terms/n/netloss.asp). This concept is the basis for the [Net Present Value Rule](http://www.investopedia.com/terms/n/npv-rule.asp), which dictates that the only investments that should be made are those with positive NPV values.

When the investment in question is an [acquisition](http://www.investopedia.com/terms/a/acquisition.asp) or a [merger](http://www.investopedia.com/terms/m/merger.asp), one might also use the [Discounted Cash Flow (DCF)](http://www.investopedia.com/terms/d/dcf.asp) [metric](http://www.investopedia.com/terms/m/metrics.asp).

Apart from the formula itself, net present value can often be calculated using tables, spreadsheets such as Microsoft Excel or Investopedia’s own [NPV calculator](http://www.investopedia.com/calculator/netpresentvalue.aspx).

BREAKING DOWN 'Net Present Value - NPV'

Determining the value of a project is challenging because there are different ways to measure the value of future [cash flows](http://www.investopedia.com/terms/c/cashflow.asp). Because of the [time value of money (TVM)](http://www.investopedia.com/terms/t/timevalueofmoney.asp), money in the present is worth more than the same amount in the future. This is both because of earnings that could potentially be made using the money during the intervening time and because of [inflation](http://www.investopedia.com/terms/i/inflation.asp). In other words, a dollar earned in the future won’t be worth as much as one earned in the present.

The discount rate element of the NPV formula is a way to account for this. Companies may often have different ways of identifying the discount rate. Common methods for determining the discount rate include using the [expected return](http://www.investopedia.com/terms/e/expectedreturn.asp) of other investment choices with a similar level of [risk](http://www.investopedia.com/terms/r/risk.asp) ([rates of return](http://www.investopedia.com/terms/r/rateofreturn.asp) investors will expect), or the costs associated with [borrowing money](http://www.investopedia.com/terms/b/borrowed-capital.asp) needed to finance the project.

For example, if a retail clothing business wants to purchase an existing store, it would first estimate the future cash flows that store would generate, and then discount those cash flows (r) into one lump-sum present value amount of, say $500,000. If the owner of the store were willing to sell his or her business for less than $500,000, the purchasing company would likely accept the offer as it presents a positive NPV investment. If the owner agreed to sell the store for $300,000, then the investment represents a $200,000 net gain ($500,000 - $300,000) during the calculated investment period. This $200,000, or the net [gain](http://www.investopedia.com/terms/g/gain.asp) of an investment, is called the investment’s [intrinsic value](http://www.investopedia.com/terms/i/intrinsicvalue.asp). Conversely, if the owner would not sell for less than $500,000, the purchaser would not buy the store, as the acquisition would present a negative NPV at that time and would, therefore, reduce the overall value of the larger clothing company.

Let's look at how this example fits into the formula above. The lump-sum present value of $500,000 represents the part of the formula between the equal sign and the minus sign. The amount the retail clothing business pays for the store represents Co. Subtract Co from $500,000 to get the NPV: if Co is less than $500,000, the resulting NPV is positive; if Co is more than $500,000, the NPV is negative and is not a profitable investment.

Read more: [Net Present Value - NPV Definition | Investopedia](http://www.investopedia.com/terms/n/npv.asp#ixzz4XQpyYaIk) <http://www.investopedia.com/terms/n/npv.asp#ixzz4XQpyYaIk>   
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