Net Present Value (NPV)

Calculating Net Present Value (NPV) – a retailers perspective

Net Present Value (NPV), also referred to as Net Present Worth (NPW), is something that retailers don't generally need to concern themselves with until it comes time to consider an investment. As is often the way with an unfamiliar topic, at first glance the explanation is not especially clear and often serves to confuse the first time reader rather than provide any real insight. To illustrate that point, consider this financial explanation of NPV: "the **net present value** (**NPV**) of a time series of cash flows, both incoming and outgoing, is defined as the sum of the present values (PV's) of the individual cash flows of the same entity". It isn't exactly easy to comprehend for someone new to the subject!

Typically retailers are time poor, so let's try to make a complex topic easy to understand. Consider this explanation for NPV...

What is Net Present Value (NPV)?

Net Present Value (NPV) calculates the value of an investment by using the discount (interest) rate and incomes and expenses.

What does Net Present Value (NPV) mean?

The NPV establishes the difference between the present value of the cash *inflows* and the present value of cash *outflows*. Doesn't seem like we are any further ahead does it really? Perhaps an example will make it easier to understand; let's assume an investment of $10,000 today at 10% (the interest rate) will provide $11,000 at the end of the year. Therefore the present value $11,000 at the desired rate of return (10%) is $10,000. The amount of investment ($10,000 in this example) is deducted from this figure to arrive at the NPV which here is zero ($10,000 - $10,000). A zero NPV means the project repays the original investment plus provides the required rate of return. A positive NPV shows a better return, negative is obviously a worse return than zero NPV.

Net Present Value can be simple!

In retail, sometimes NPV is even easier than the examples above. Thinking of retailers and their use of Net Present Value in particular, let's consider a situation where all future cash flows are incoming (sales) and the only cash outflow is the purchase price (new counters). Many investments in retail are like this. The Net Present Value is simply the present value (PV) of future cash flows (which in our example is additional sales) minus the cash outflow (purchase price of the new counters). Let's run that example. Imagine we spend $200,000 on new counters. Right now our sales counters are small, cluttered and the lines of customers waiting are embarrassingly long. We find frustrated customers leaving the store at peak times in particular. As a result if we replace the counters with new ones designed to address the issues we have, our belief is that sales will increase by $250,000 per annum

in Year 1. We also have to borrow the $200,000 and the interest rate is 10% (also known as the discount rate), or $20,000. Thus the NPV is ($250,000 - $20,000) - $200,000 = $30,000. This is a simple and arguably crude example of demonstrating what NPV is.

New Present Value – an issue for retailers to be aware of:

If you are looking at the example above and you are a retailer, you will immediately spot a glaring flaw. Net Present Values assumes the future cash flows you put into the equation are correct and will occur exactly as planned. Retailers looking at this example will understand that the sales increases are an estimate. Obviously things happen (new competitors, road changes, economic issues, natural disasters etc.) which might result in the increase in sales being higher or lower than planned. This highlights an issue with Net Present Value; because you are estimating future cash inflows (incomes), the resulting NPV could be wrong. The only real solution to this is to make sure you are as accurate as you can be with the future cash flows; the best advice is to "err on the conservative side of realistic" with your future cash flow projections. This issue doesn't mean you shouldn't use Net Present Value, it simply means you need to be aware of the issue and manage it appropriately.

Why is Net Present Value used?

NPV is a central tool in discounted cash flow (DCF) analysis, and is a standard method for using the time value of money. It is often used to assess long-term projects. NPV is widely used for capital budgeting, in economics, finance and accounting as it measures the excess or shortfall of cash flows, in present value terms, once financing charges (interest charges) are met. For retailers it is especially useful in assessing investments in the business, but specialist advice from a qualified financial practitioner should always be sort.

Net Present Value in Retail

Whenever considering an investment retailers should always consult their accountant. Not all investments in retail are as easily assessed as the NPV example provided above pretends. Let's consider a common enough investment by retailers - repainting a store. It is hard to say that repainting a store will suddenly grow sales by (let's say) 5%. It is often hard to quantify the benefit of such an investment at all. Many things in retail suffer from the same problem; how do new floor coverings, new shelving etc. add to sales? We know from experience that they do, but how do you quantify that for purposes of analysing an investment? Often retailers simply put these costs down to a "cost of doing business", rather than even trying to quantify it. We retailers know that good floor coverings, well designed shelving and a high quality paint job will appear "new" for some years. In other words, even though the investment is all up front, the benefits are spread over a number of years, meaning that these investments can indeed be analysed using NPV. The issue is in trying to quantify the cash flow *into* the business, or in other words, identifying how much sales will increase by. To do this, try to quantify the cash flow into the business by considering doing nothing, i.e.: not painting an obviously dated and tired store. In almost all cases of old tired stores, doing nothing will continue to result in flat or sliding sales. If you do invest in new flooring coverings or paint, you

might note that sales have a modest increase as more customers come into the store since it is a nice place to be. Or the existing customers might stay longer because it's much nicer than it used to be. As retailers know - the longer customers stay, the more they buy. By looking at these two scenarios you can estimate (roughly) what sort of cash flow increase you are achieving and therefore be able to use develop an NPV for the investment.

The Net Present Value (NPV) Formula:

Each cash inflow and each cash outflow is discounted back to its present value. In other words, all those future incomes and expenses are presented in today's dollars. Here's the formula:

$$\frac{R_t}{(1+i)^t}$$

What does each element mean?

t - the time of the cash flow
i - the discount rate (the rate of return that could be earned on an investment in the financial markets with similar risk.); the opportunity cost of capital. An easier way for many retailers is to assume that this is the interest rate.
R_t- the net cash flow (the amount of cash, inflow minus outflow) at time *t.*

What's the result of this? A Net Present Value presented in dollar terms. A basic rule of thumb is that if the result is zero or above, it is an investment well worth considering. The higher above zero it goes, the better it is. Take advice from your accountant before making any investment decisions.

How is Net Present Value (NPV) used?

A common approach to choosing the discount rate factor (or interest rate) is to decide the rate which the capital needed for the project could return if invested in an alternative project. If, for example, you choose to invest the money in buying new counters and determine that this gives us an NPV of say $30,000 which is a 15% return on the capital invested. Now let's imagine we look at investing in carpet and paint and determine this will cost the same amount as the counters, but that the NPV is $10,000 which translates to a 5% return on the capital invested. Given this situation, you would obviously invest in the counters. When analysing projects in a capital constrained environment (welcome to retail!), it is wise to consider not only the NPV, but also the cost of the capital.

NPV in decision making

NPV is an indicator of how much value an investment or project adds to the firm. If it is a positive value and it is appropriately risked (that is not too high a risk), then generally these projects are accepted, with a couple of "but's". The first "but" is: assuming you can get the capital to invest. The

second “but” is that compared to where else you could invest the money, this investment must be the best. You must also consider leaving the money in the bank and getting interest!

Common issues with NPV

There are a few issues with NPV that retailers should be aware of. We have already highlighted the issue of making sure the future cash inflows are as accurate as possible. Other factors to consider include: the calculation of taxes, uneven cash flows and salvage value (the value of the investment at the end of its useful life). Some more issues to consider:

- Negative cash flows. For example, if the cash inflows are generally negative late in the project (*e.g.*, a petrol station may incur costs with the clean-up and restoration of land where fuel has contaminated the ground), then at the end the project has cash *outflows*.
- Risk Premium. Banks charge a higher rate of interest for risky projects, and it is a reasonable method of calculating risk. However, that doesn’t mean that this is a valid approach to adjusting a net present value for risk as it doesn’t necessarily capture the true cost of that risk.
- NPV in isolation doesn’t tell the whole story. NPV doesn’t provide an overall picture of the profit or loss of a project. NPV is often used in conjunction with other measures such as the Internal Rate of Return (IRR).
- Non specialist users (like most of us retailers) often compute NPV based on cash flows after interest. This is wrong because it double counts the time value of money.

Summary

Net Present Value is a financial analysis tool used to determine whether an investment is beneficial or not. NPV establishes the difference between the present value of the cash *inflows* and the present value of cash *outflows*. A zero NPV means the project repays the original investment plus provides the required rate of return. A positive NPV is considered to be good, negative is obviously not good.

Net Present Value is often used in conjunction with other financial tools, such as an Internal Rate of Return. If you are using NPV, take the advice of an accountant or your trusted financial professional. NPV needs to be calculated correctly, the inputs for cash flows need to be as accurate as possible, the project should be affordable for the business and interpretation of the results should be conducted by an experienced professional.

www.zumocalculators.com features 70+ calculators specifically designed for retailers.