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Building the Business Case – NPV IRR

Now that we have got our cash flow together we can do what we really need to do with this business case. We need to know if this is a good investment or not. To do that we are going to calculate the three methods of project evaluation, which are calculating an NPV, IRR and a payback period. We are going to do each of those on our cash flow. We will just do the first five years.

In order to calculate our NPV, we need to know what our cost of capital is. Quite often in this kind of project, we just get given a discount rate. In this case, we are just told that the cost of capital is 12%. It is a given. Every time we evaluate a project for this company, we use 12%. We can then use that to compare different projects. We will put that down as an assumption and create a named range called Cost of Cap so that we can refer to that in our NPV calculation. Remember with an NPV, what you are doing is saying, if I get this money in five years' time, I need to discount it back by 12%, 12%, 12% and so on, so the NPV is how much money has been left over after the cost of my capital has been satisfied. Sometimes it's called a discount rate, sometimes it's called a hurdle rate. The company is saying you must make at least 12% for it to be worth their while.

The text books will say that if it's a positive NPV you should do it, if it's a negative NPV you shouldn't do it. In my experience, it's not as simple as that. It really depends on the situation and it depends on the scenario. We will probably end up with a small NPV when we calculate this. But when we go and do our scenario analysis, we will see that it becomes a really large number and it becomes a small number based on our scenario analysis.

Let's go ahead and calculate the NPV. The concept behind a NPV is pretty complicated but the formula is pretty easy. In the P&L sheet, the rate is Cost of Cap and then I am just going to pick up the first five years' worth of cash flow. We can see that is a $300,000 NPV so theoretically we should go ahead with the project. It's not as simple as that. We will go through and see if there is anything more this can tell us about the project.

The IRR is even easier. Put in IRR, five years of cash flow which gives 15%. That is pretty good. What that means is that for the first five years, that series of cash flow is returning on average a 15% return. That is higher than our cost of capital because it is a positive NPV. We know that if your NPV was zero, then your IRR should be exactly what your cost of capital is shouldn't it? Shall we try that out and test that theory? Because the NPV is whatever cash is left over after your cost of capital has been satisfied, then if your IRR was exactly what your cost of capital is, your NPV should be exactly zero. There is an inverse relationship between the NPV and the IRR. Let's try that out. What I would like you to do is set your NPV to exactly zero by using one of the inputs. Let's say the price for example. We will say, what does your price need to change by such that your NPV will be zero? We will do it using Goal Seek.

Let's go to What IF analysis and Goal Seek. We will set this cell here to zero by changing the price of the premium. Say okay and so we get an NPV of exactly zero and we can see that IRR is exactly the cost of capital which is 12%. We will change that back. That was just to test the relationship between the two. What's really interesting though is that if we go back to our assumptions, we can see that if our premium goes down to $388, so if it only decreases by a small amount, you can see that our NPV is zero. We really only have a very small margin. We can't afford to be discounting at all in terms of our pricing. It's quite interesting. Let's go and change that back to what it was and come back to P&L

We've got NPV and IRR.

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