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Chapter 6

OFFSET Function

Let's take a look at the OFFSET function. This is a function that is quite commonly used in financial modelling. It is quite hard to get your head around and quite difficult to audit. I do try to avoid it because it can be difficult for some people to take apart. But it can be useful in some certain situations and I just want to make sure that you understand how it works if you do come across it in models, because it is fairly commonly used.

The way that it works and it shows you how to do this step by step in your book in chapter 6, the way that it works is it basically starts from a reference point and then it will OFFSET it by a certain number of cells. You tell it I want to go so you start from a certain point and you say I want you to go two steps forward like a game of chess and two steps to the right for example. That's how it works, it is particularly useful for staggering something.

Let's take a look at an example, under your practical exercises sheet there is a file that has a situation where you are recognising the sales. We are looking at the difference between how a P&L work and a cash flow works for example. With the P&L, you recognise the revenue when it's earned whereas you don't actually get the cash, so in this example here, if you have terms of one month, it means you actually make the sale in one month but you don't get the cash until the next month. We wanted to show sales in one line and cash in the next line, what you could do is just say equals the previous one line, that would be much simpler.

Except that what we want to do here is make those terms a variable amount so let me just format that, that's an input, that's my signal to another modeller, that's a hard coded variable that is something that can change. Because if I want to change that to two months for example the formula is not going to change, so what we need to do here is to make that variable. What I am going to do is to say my starting point is 966 except I want to push it back, so OFFSET it by minus one and if you say plus one on the row it will go this way and if you say minus one it will go that way. Where as if you say rows plus one then this way, minus one then this way, so it's fairly sort of intuitive in that way.

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We will go into the OFFSET, so you start from 966 is going to be your reference point and the rows we just leave that blank because we are not changing the rows and your columns is going to be minus except instead of typing in a one, we are going to link it to that one there and we then we hit our F4 short cut to fix that reference there. So fix it to that there and then copy it across and so what that does it staggers it by one and if I change that to a two it will push it back to two.

We most often use this for staggering something by a variable amount, if you are doing the advanced financial modelling in Excel course we will use this in the factory rollout example because we are going to do some scenario analysis on how long it takes to build a factory. We say that we think it's going to take nine months or 3 quarters to build a factory but that's a variable number. We are going to do some scenario-sensitivity analysis on that, we can say what if it would take two quarters or what if it would take four quarters and that by building the formula in this way we will be able to push it backwards and forwards in a really simple way. It is particularly helpful for scenario and sensitivity analysis or for example with the start date if you have a project and you are looking at pushing that project forward by a variable amount. You want to say what if our project got pushed back three months or pushed forward and have that changing. That's where the OFFSET function is useful.

Just going back to our formula here that we have been calculating you can see that it's giving us the word sales, which is not necessarily what you want. If we copy it right across because of course following best practice we want to have exactly the same formula all the way across. But we can see here that the formula there is not working very well. We need to put some kind of error suppression around it or something to stop that from happening. What we want to do is to show in some cases it's going to be an error so we can say IFERROR, we can use an error to say if it's an error, the problem in this case though is that word sales is not an error, it is going to allow that to go through. We only want to show if it's a number, so what we can do is put an ISNUMBER reference around it, so we can say if our formula returns as a number, give us a value otherwise just give it a zero.

So basically you could have said if it's a text or if it's an error, give me zero, but then you have to do two IF's. It's simpler if we say, if it's a number give me the formula otherwise give me a zero. Let's do that, we go in and say copy the whole formula, so IF is number, so if the formula is a number, give me the formula, otherwise give me a zero, close bracket, just put in an extra bracket in there. If the formula is a number, give me the formula otherwise give me a zero and then you can just copy it all the way across and that way it is not going to show if it is text and it's not going to show if it is an error. We can change it to three months, we can change it to one month and it's going to be changing and staggering. All we have to do when we are do our sensitivity or scenario analysis, is just simply make that change and it will push it backwards or forwards.

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That is how we would use an OFFSET function in a financial model.

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