



# ICAEW Excel 12 Rate

In this video, I'm going to talk to you about the Rate function in Excel, which will calculate the overall effective interest rate of an investment.

Best illustrated with an example which we have here. So, we've got an initial investment of 1,000 cash out. And then in exchange for that initial investment, we will be receiving for eight years, four percent of the cash interest rate of that one thousand. So, if that was the end of it, then the effective interest rate will be four percent. However, because at maturity at the end of the eight years, we will be receiving not just our initial investment of one thousand, but proceeds at maturity will be one thousand five hundred, we are earning for ourselves an additional rate of return. There's effectively 500 of accrued interest that there as well. So, our overall effective interest rate will be the cash interest rate of four percent plus the overall effective interest rate determined by the accrued interest. So we would expect an answer coming out to greater than four percent.

The way it works, you can see this bottom rate equals rate, open bracket, nper, number of periods, comma, PMT, what's the regular annual payment, comma, PV, so that's going to be the initial investment of 1,000, comma, FV, that's the proceeds of maturity, comma, type, which is just a flag so that we can indicate whether our assumption is that the cash flows are taking place at the beginning or at the end of the time periods. You can actually ignore that. Well, most of the time you can ignore that final argument, the type argument. I'll talk about that in a minute.

So, let's have a go at doing this first and see what we come up with. Equals, rate, open brackets, nper number of periods, well, for us, that's going to be eight, so I'm going to point to this cell here with the eight in it, comma, pmt, what's the regular periodic cash flow, so it's going to be four percent of a thousand and that's cash coming into us, so I'm going to denote that as a positive number, four percent multiplied by a thousand, that's the pmt, comma. Now the present value, the present value being the initial investment, that's the one thousand at the start of T zero. Now, that's cash out from our perspective. So the present value in the rate function, it would need to be negative a thousand, not positive a thousand. So minus, a thousand, comma, and then FV future value, that's going to be the 1,500 future value proceeds at maturity, that will be positive because that's cash coming in for us. And I'm going to close my brackets, and that will give me the right answer. OK, so we get eight point six percent, which feels about right if the cash interest rate of four percent plus some additional effective rate of return on the investment because the proceeds and maturity is significantly higher than the initial investment.

So just to finish this off, let's talk a little bit about this type argument at the end. So this is the function. Now, if I am going to click, hope you can see this, see the mouse just below the ribbon, we've got insert function here that affects if I click here, I will bring up the function arguments box. And this is just a place to go where you can see what the different arguments are, and there's a little bit of narrative here about what the different arguments mean. OK, so if I click down here, so I've got all of the information in here already that I need, if I click into that type box down below,

you can read what it says. It says, take is a logical value payments at the beginning of the period, type in a one, payment at the end of the period, type in to zero or omitted. So at the moment it is omitted. So we are assuming that the payment is at the end of the period and generally, although not necessarily always the case, generally, that will be what you would want. So, if your payments are coming at the end of the period, if that's what you're assuming, you either leave this out or you hard code a zero. If you want to make the assumption that the payments are taking place at the start of the period, you would hard code a one there. But I'm not going to do that. I'm just going to go back to where it was. I'm going to leave it empty.

OK, so equals rate calculates the overall effective interest rates of an investment. It requires the number of periods, the regular periodic payment, the present value, the future value and also type indicates when during the period the cash flow happens at the start of the year or the end of the year.