

BUSN3049 Corporate Finance Tutorial 2

- For each of the following, compute the future value (Do not round intermediate calculations and round your answers to two decimal places).

| Present Value (\$) | Years | Interest Rate (%) | Future Value (\$) |
|--------------------|-------|-------------------|-------------------|
| 3,100 | 7 | 17 | |
| 8,553 | 20 | 7 | |
| 90,305 | 14 | 10 | |
| 228,382 | 30 | 3 | |

Answer

To find the value of a lump sum, we use $FV = PV(1 + r)^t$.

$$FV_1 = 3,100(1.17)^7 = 9,303.85$$

$$FV_2 = 8,553(1.07)^{20} = 33,097.41$$

$$FV_3 = 90,305(1.10)^{14} = 342,933.09$$

$$FV_4 = 228,382(1.03)^{30} = 554,343.06$$

- You have \$20,000 you want to invest for the next 40 years. You are offered an investment plan that will pay you 6 percent per year for the next 20 years and 10 percent for the last 20 years. How much will you have at the end of 40 years? Does it matter if the investment plan pays you 10 percent per year for the first 20 years and 6 percent per year for the next 20 years? Why or why not?

Answer

In this case, we have an investment that earns two different interest rates. We will calculate the value of the investment at the end of the first 20 years, then use this value with the second interest rate to find the final value at the end of 40 years. Using the future value equation, at the end of the first 20 years, the account will be worth:

$$FV = PV(1 + r)^t = 20,000(1.06)^{20} = 64,143$$

Now we can find out how much this will be worth 20 years later at the end of the investment. Using the future value equation, we find:

$$FV = PV(1 + r)^t = 64,143(1.10)^{20} = 431,520$$

It is irrelevant which interest rate is offered as long as each interest rate is offered for 20 years. We can find the value of the initial investment in 40 years with the following:

$$\begin{aligned}FV &= PV(1 + r_1)^t(1 + r_2)^t \\ &= 20,000(1.10)^{20}(1.06)^{20} \\ &= 431,520\end{aligned}$$

With the commutative property of multiplication, it does not matter which order the interest rates occur, the final value will always be the same.