1. If you invest $5000 in a CD with an interest rate of 8% per year, how much will you have at the end of 5 years?

   Answer:

   The correct answer is 7,346.64.

   See handout for calculating the Future value of a lump Sum.

$$P_T = P_0(1 + r)^T$$

$$T = numbers\ of\ peroids\ to\ maturity$$
$$r = the\ interest\ rate$$
$$P_T = Expected\ future\ value\ of\ investment$$

$$In\ out\ example\ we\ have:\ P_T = 5000(1 + 0.08)^5 = 7{,}346.64$$

2. What is the present value of $100,000 paid at the end of ten years, if your opportunity cost is 5%?

   Answer:

   The correct answer is 61,391.33.

   See handout for calculating the Present value of a lump Sum

$$P_0 = P_T(1 + r)^{-T}$$

$$T = numbers\ of\ peroids\ to\ maturity$$
$$r = the\ interest\ rate \text{ - Opportunity cost}$$
$$P_T = Expected\ future\ value\ of\ investment$$

$$In\ out\ example\ we\ have:\ P_T = 100\ 000(1 + 0.05)^{-10} = 61{,}391.33$$

3. If the annual interest rate is 4 percent, which one would you prefer?

   a) Receive $25,000 three years from now?

   Answer:

   The correct answer is a.

In order to compare these cash flows, we need to bring them to the same point in time. You can compare them all at time 0. The present value of $25,000 three years from now is equal to $25000/(1.04)^3 = 22,224.9$. This is the highest.

b) Receive $18,000 one year from now?

In order to compare these cash flows, we need to bring them to the same point in time. You can compare them all at time 0. The present value of $18,000 one year from now is equal to 18000/(1.04) = 17,307.7. This is not the highest value.

In order to compare these cash flows, we need to bring them to the same point in time. You can compare them all at time 0. The present value of $25,000 three years from now is equal to $25000/(1.04)^3 = 22,224.9$. This is the highest.

c) Receive $23,000 two years from now?

In order to compare these cash flows, we need to bring them to the same point in time. You can compare them all at time 0. The present value of $23,000 one year from now is equal to $23000/(1.04)^2 = 21,264.8$. This is not the highest value.

In order to compare these cash flows, we need to bring them to the same point in time. You can compare them all at time 0. The present value of $25,000 three years from now is equal to $25000/(1.04)^3 = 22,224.9$. This is the highest.

4. If your goal is to maximize your investment value at the end of five years, which option would you prefer?

a) Investing $9,000 today at an interest rate of 3 percent per year

In order to compare these alternatives, we need to find the future value at the end of five years: $9000(1.03)^5 = 10433.47$. This is not the highest value.

In order to compare these alternatives, we need to find the future value at the end of five years: $9000(1.02)^2(1.04)^3 = 10532.78$. This is the highest.

b) Investing $8,000 today at an interest rate of 5 percent per year

In order to compare these alternatives, we need to find the future value at the end of five years: 8000(1.05)5=10210.25. This is not the highest value.

In order to compare these alternatives, we need to find the future value at the end of five years: 9000(1.02)2(1.04)3 =10532.78. This is the highest.

c) Investing $9000 today at an interest rate of 2 percent per year for two years and then at an interest rate of 4 percent per year for the last three years

In order to compare these alternatives, we need to find the future value at the end of five years: 9000(1.02)2(1.04)3 =10532.78. This is the highest.

Answer:

The correct answer is c.