What is the Time Value of Money?

Worksheet

Time value of money means present cash is worth more than the same amount in the future because of its earning potential; it's captured by the formula FV = PV (1 + r)^n, linking present value, future value, rate and time.

$$PV = \frac{FV}{(1+r)^n}$$

Questions

1. $1,000 today at 5% annual interest is worth how much in 1 year?

A) $1,050
B) $1,000
C) $950
D) $1,500

2. Which factor is NOT part of the TVM formula FV = PV(1+r)^n?

A) Present value
B) Interest rate
C) Number of periods
D) Inflation index

3. What does 'discounting' a future cash flow mean?

A) Increasing its value
B) Converting it to present value
C) Ignoring it
D) Multiplying by n

4. All else equal, a higher discount rate makes a future cash flow's present value

A) Higher
B) Lower
C) Unchanged
D) Negative

5. You invest $5,000 today at 7% annual interest. What is it worth in 10 years?

6. How much must you deposit today (PV) to have $20,000 in 8 years at 5% interest?

7. Which is worth more: $1,000 received today, or $1,000 received in 3 years, if the discount rate is 4%?

8. Define: What is the time value of money?

9. Define: What is the core TVM formula?

10. Define: What is 'discounting'?

Answer Key

1. A) $1,050 - FV = 1000(1.05)^1 = $1,050.

2. D) Inflation index - The basic formula uses PV, r and n - not a separate inflation index.

3. B) Converting it to present value - Discounting brings a future amount back to its present-day equivalent.

4. B) Lower - A higher r increases the denominator (1+r)^n, lowering PV.

5. FV = PV (1+r)^n FV = 5000 (1.07)^10 FV = 5000 1.9672 $9,835.76

6. Rearrange: PV = FV / (1+r)^n PV = 20000 / (1.05)^8 1.05^8 1.4775 PV = 20000 / 1.4775 $13,536.90

7. Compare via present value of the future amount PV of $1,000 in 3 years = 1000 / (1.04)^3 1.04^3 = 1.124864 PV $889.00, which is less than $1,000 today So $1,000 today is worth more

8. The idea that money available today is worth more than the same amount in the future, due to its earning potential.

9. FV = PV (1+r)^n - future value equals present value grown at rate r for n periods.

10. Converting a future cash flow back into today's value using PV = FV / (1+r)^n.