

Victoria University of Bangladesh

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Am. to the. Q. No-1

Time value refers to the idea that the value of an item or sum of money changes over time and is often greater in the present moment compared to the same item or sum in the future. This is because the value of money is perceived to decrease over time due to inflation, opportunity cost and other factors, making it less valuable in the future.

The techniques used in the time value of money include:

1. Present value (PV) calculation - this determines the current worth of a future sum of money, taking into account the time value of money and a discount rate.

2. Future value (FV) calculation - this calculates the future worth of a present sum of money, taking into account interest earned over time.

3. Discount rate - this is the rate of which ~~a~~ a future sum of money is discounted to determine its present value.

3. Annuity - this is a series of equal

payments made at regular intervals over a specified time period.

5. Amortization: this is the process of paying off a debt, such as a loan, in equal installments over a specified period of time.

6. Compound interest - this is interest calculated on the original principal and on the accumulated interest of previous periods.

These techniques are widely used in

finance, accounting and economics to make informed decisions about investments, loans and other financial transactions.

Ans. to the Q. No-2

EAR : EAR stands for effective Annual Rate, which is a measure of the true annual cost of borrowing or the true annual yield of an investment. It takes into account the effect of compounding, which occurs when interest is earned on both the principal and accumulated interest over time.

The EAR is a more accurate reflection of the true cost of borrowing or the true yield of an investment compared to the ~~annual~~ nominal interest rate.

Discounting: Discounting is a financial technique used to determine the present value of a future payment or stream of payments. It is a method of adjusting the value of future cash flows to reflect the time value of money, which states that money received today is worth more than

a money received in the future. In discounting, the future payment or stream of payments is multiplied by a discount factor.

Compounding: Compounding is the process of generating earnings. It refers to the accumulation of interest on other earnings on an investment over time, where the reinvested earnings themselves earn interest, leading to exponential growth of in investment. This results in an increase in the overall value of an

investment and the amount of money earned from it, compared to simply earning interest on the original amount of investment.

Annuity: An annuity is a financial product that provides a regular income, usually for a specific period of time or for the lifetime of the recipient.

It is often used as a retirement savings vehicle, where an individual invests a lump sum of money and then receives regular payments, typically monthly or

annually. Annuities can be either fixed, where the payment amount can fluctuate based on the performance of underlying investments.

There are several types of investment annuity, including interest immediate annuity, ~~deferred~~ deferred annuities and indexed annuities.

Amortization schedule: An amortisation schedule is a table that shows the payment schedule for a loan, including the amount of each payment that goes towards paying off the principal and the amount that goes towards paying interest. It shows how the balance of a loan decreases over time and how the distribution of each payment changes, with a larger portion going towards paying off the principal in later payments. Such as a mortgage or a car loan.

Ans. to the Q. No - 3

Solution,

$$\text{Future value} = P_{v_0} (1+i)^n$$

where,

$$\text{Present value } (P_{v_0}) = \$5,00,000$$

$$\text{interest rate } (i) = 8\% = .08$$

$$\text{The number of years } (n) = 10 \text{ years}$$

$$\text{Future value } (F_{v_n}) = \$5,00,000 (1+0.08)^{10}$$

$$= \$500,000 (1.08)^{10}$$

$$= \$500,000 \times 1.967$$

$$= \$983841.67$$

So, after 10 years of investment at 8% interest ~~compounded~~, Mr. JinPi's investment would be worth \$9,83,841.67

Ans. to the Q. No - 4

Solution -

$$\text{Payback period (PBP)} = \frac{CF_0 \text{ (initial investment)}}{CF_t \text{ (cash flows)}}$$

Given, For company A:

$$\text{initial investment (} CF_0 \text{)} = \$300,000$$

$$\text{cash flows (} CF_t \text{)} = \$100,000$$

$$\begin{aligned} \text{Payback period (PBP)} &= \frac{\$300,000}{\$100,000} \\ &= 3 \text{ years} \end{aligned}$$

For company B:

$$\text{initial investment (} CF_0 \text{)} = \$400,000$$

$$\text{cash flows (} CF_t \text{)} = \$1,05,000$$

$$\begin{aligned} \text{Pay-back period (PBP)} &= \frac{\$400,000}{\$1,05,000} \\ &= 3.8 \text{ years} \end{aligned}$$

Based on these calculation, both companies will take almost the same amount of time (3 to 3.8 years) to recover their initial investment. In general a shorter payback period is usually considered more attractive.

So, company A is the acceptable investment.