Victoria University Of Bangladesh

Course title ~ ACT-217

Bachelor of Tourism & Hotel Management

Submitted By ~ Management Accounting
Name ~ Khan Sifat
Student ID: 1521530011
Batch - 53
Program - BTHM

1.

Concept of Time Value of Money (TVM):

The **Time Value of Money (TVM)** is the idea that money available today is worth more than the same amount in the future due to its potential earning capacity. This is because money can be invested to generate returns over time. In other words, a dollar received today is more valuable than a dollar received in the future because of interest, inflation, and opportunity costs.

For example, if you have **$1,000 today**, you can invest it in a bank or business and earn interest or profit. But if you receive that **$1,000 after five years**, you miss out on the potential earnings.

Techniques Used in Time Value of Money:

Several techniques help in evaluating the time value of money:

1. **Present Value (PV)** – Determines the current worth of a future sum of money, considering a discount rate.
   PV=FV(1+r)tPV = \frac{FV}{(1 + r)^t}

Where **FV** = Future Value, **r** = Interest Rate, and **t** = Time (years).

2. **Future Value (FV)** – Calculates how much an investment today will be worth in the future with compound interest.
   FV=PV×(1+r)tFV = PV \times (1 + r)^t
3. **Discounting** – The process of determining the present value of a future cash flow by applying a discount rate.

4. **Compounding** – The process of earning interest on both the initial principal and the accumulated interest over time.

5. **Annuity** – A series of equal cash flows (payments or receipts) occurring at regular intervals, such as monthly or yearly. Examples include **pension payments, insurance, and loan EMIs**.

6. **Amortization Schedule** – A table that shows the breakdown of loan payments into principal and interest over time. This is used in **home loans and car loans**.

2.

Effective Annual Rate (EAR):

Effective Annual Rate (EAR) is the actual interest rate an investor earns or a borrower pays after accounting for compounding within a year. It provides a more accurate measure of interest than the nominal (stated) rate.

Formula:

EAR=(1+rn)n−1 EAR = \left(1 + \frac{r}{n}\right)^n - 1

Where:

- rr = Nominal annual interest rate (decimal form)
- nn = Number of compounding periods per year

Example:

If a bank offers a **10% annual interest rate compounded quarterly**, the **EAR** is:

EAR=(1+0.104)4−1 EAR = \left(1 + \frac{0.10}{4}\right)^4 - 1 =(1.025)4−1= (1.025)^4 - 1 =1.1038−1= 1.1038 - 1 =10.38%= 10.38\%

So, the actual interest earned is **10.38%**, not just 10%.

Amortization Schedule:

An **Amortization Schedule** is a table that shows the breakdown of loan payments over time into **principal** and **interest** portions. It helps borrowers understand how their loan balance decreases with each payment.

Key Components:

1. **Loan Amount (Principal)** – The initial amount borrowed.
2. **Interest Rate** – The rate charged by the lender.
3. **Loan Term** – The number of months or years for repayment.
4. **Monthly Payment** – A fixed amount paid each period, covering both principal and interest.

Example of an Amortization Schedule (for a $10,000 loan, 5% annual interest, 3-year term):

Payment No.	Payment ($)	Interest ($)	Principal ($)	Balance ($)

1	299.71	41.67	258.04	9,741.96
2	299.71	40.59	259.12	9,482.84
3	299.71	39.51	260.20	9,222.64
...	...	...	...	...
Final	299.71	1.24	298.47	0.00

3.

We will use the **Future Value (FV) formula** to calculate the value of Mr. JinPi's investment after 10 years.

Formula for Compound Interest:

FV=PV×(1+r)tFV = PV \times (1 + r)^t

Where:

- **FV** = Future Value
- **PV** = Present Value (Initial Investment) = $500,000
- **r** = Annual Interest Rate = 8% = 0.08
- **t** = Number of Years = 10

Calculation:

FV=500,000×(1+0.08)10FV = 500,000 \times (1 + 0.08)^{10} =500,000×(1.08)10= 500,000 \times (1.08)^{10} =500,000×2.1589= 500,000 \times 2.1589 =1,079,450= 1,079,450

Final Answer:

After **10 years**, the investment will grow to **$1,079,450**.

4.

Payback Period Calculation:

The **Payback Period** is the time required for an investment to recover its initial cost from the generated cash flows. It is calculated using:

Payback Period=Initial InvestmentAnnual Cash Flow\text{Payback Period} = \frac{\text{Initial Investment}}{\text{Annual Cash Flow}}

For Company A:

- **Investment:** $300,000
- **Annual Cash Flow:** $100,000

Payback Period=300,000100,000=3 years\text{Payback Period} = \frac{300,000}{100,000} = 3 \text{ years}

For Company B:

- **Investment:** $400,000
- **Annual Cash Flow:** $105,000

Payback Period=400,000105,000=3.81 years≈3 years and 10 months\text{Payback Period} = \frac{400,000}{105,000} = 3.81 \text{ years} \approx 3 \text{ years and 10 months}

Which One is Acceptable?

- **Company A's payback period is 3 years**, which is shorter than **Company B's 3.81 years**.
- **Shorter payback periods are generally preferable** because they recover the investment faster, reducing risk.
- However, other factors (profitability, risk, return on investment) should also be considered.

Final Decision:

- If the decision is based purely on **payback period**, **Company A is preferable** since it recovers the investment faster.
- If **long-term cash flow and profitability** are considered, Company B could still be a good option.