RAMA UNIVERSITY

UTTAR PRADESH KANPUR

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FACULTY OF COMMERCE AND MANAGEMENT

COURSE: B.COM V SEM.

SUBJECT: INTRODUCTION TO FINANCIAL MANAGEMENT

SUBJECT CODE: BCH 505

LECTURE: 9

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LECTURE-9

DIMENSIONS OF TIME VALUE OF MONEY

FUTURE VALUE

Future Value Of Single Amount

Future Value of Annuity

PRESENT VALUE

Present Value of Single Amount

Present Value of Annuity

Future Value of a Single Amount: Suppose you have Rs. 1000 today and you deposit it with a financial institution, which pays 10% interest compound annually, for a period of 2 years.

		Rs.
Ist Year	Principal at the beginning	1000
	Interest for the year	100
	Principal at the end	1100
IInd Year	Principal at the beginning	1100
	Interest for the year	110
	Principal at the end	1210

FORMULA:

$FV_n = PV (1+k)^n$

Where FV_n = future value n years hence

PV = present value

k = interest rate per year

n = number of year for which compounding is done.

The factor $(1+k)^n$ is referred to as the compounding factor or the **Future Value Interest Factor ($FVIF_{k,n}$)**

Illustration 1: If you deposit Rs. 1000 today in a bank which pays 10% interest compounded annually, how much will the deposit grow to after 8 years and 12 years?

Rs. 1000(1.10) 8 = Rs. 1000(2.144)
= Rs. 2.144

The future value, 12 years hence will be:
Rs. 1000(1.10) 12 = Rs. 1000(3.318)
= Rs. 3.318

$$\mathbf{FVn = PV \left(1 + \frac{k}{m}\right)^{m*n}}$$

Future Value of Annuity: An annuity is a series of periodic cash flows (payments or receipt\pts) of equal amounts. The premium payment of a life insurance policy, for example, is an annuity.

Illustration 2: Suppose you deposit Rs 1000 annually in a bank for 5 year and your deposits earn a compound interest rate of 10%. What will be the value of series of deposits at the end of 5 years?

Rs 1000(1.10) 4 + Rs 1000(1.10) 3 + Rs1000 (1.10) 2 + Rs 1000(1.10) 2 + 1000 (1.10)
=Rs 6105

$$\mathbf{FVAn = A \left[\frac{(1+k)\ n\ - 1}{K}\right]}$$

Where FVAn = future value of an annuity which has a duration of n Period
= Constant periodic flow
K = Interest rate per period N
– Duration of the annuity

The term $\frac{(1+k)\ n\ - 1}{K}$ is referred to as the **future value interest factor for an annuity** .

i.e. (FVIFAn)

Present Value of a Single Amount: The present value of a future cash inflows or outflow is the amount of current cash flow that is equivalent desirability, to the decision maker, to a specified amount of cash to be received or paid at the future date. The process of determining the present value of a future payment or a series of future payments is called discounting.

Illustration 3: Suppose someone gives you Rs1000 six year hence. What is the present value of this amount if the interest rate is 10%?

Formula:

$$PV = FVn \left[\frac{1}{1+k} \right]^{n}$$

The factor $\left[\frac{1}{1+k} \right]^{n}$ Is called the **discounting factor or (PVIFkn)**

The present value is

Rs1000 (PVIF10%, 6) = Rs 1000 (0.5645) = 564.5

Illustration 4: Find the present value of Rs1000 receivable 20 years hence if the discount rate is 8%.

$$Rs1000 \left(\frac{1}{1.08} \right) 20 = Rs1000 \left(\frac{1}{1.08} \right)^{10} \left(\frac{1}{1.08} \right)^{10}$$

Rs1000 (PVIF8%, 10) (PVIF8%,
10) 1000(0.463) (0.463) = Rs214

Present Value of an Annuity

$$\mathbf{PVAn = A \left(\frac{(1+k)\ n - 1}{K\ (1+k)\ n} \right)}$$

PVAn = Present value of annuity having duration n periods
A = constant periodic flow
K = Discount Rate

Illustration 5: Present value of a 4 year annuity of Rs10000 discounted at 10%

PVA4 = 10000(PVIFA10%,4)
10000(3.170)
31700