STRATEGIC FINANCIAL MANAGEMENT I
(ACC 405) 3 UNITS
MATHEMATICS OF FINANCE

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Mathematics of Finance

•Time Value of Money.

Financial decisions recognize that money has value over time. This means that an amount of money now, has a greater value than the same amount at some time in the future. This idea is based on the fact that if you have say "Y" now, you can make it to work for you so that you obtain "Y plus" naira in the future

•Interest

Interest like commodity price in the commodity markets, is the price one pays for money in the financial markets. It is that vital factor that is used to quantify the time value of money. Interest rates make it possible the conversion of the values of cash flows having different timings to a desired point in time; for the purpose of financial decision making.

•Compound Interest

As against simple interest, where interest is charged on the principal only for the relevant period, compound interest is charged and added to the principal from period to period; both principal and interest forming the basis of the next period interest calculation. In effect, interest is being earned on interest.

•Future Value of a Lump Sum

One area in which the compound interest principle is applied is where a single lump sum is deposited, for example, in a savings or fixed deposit account at a specified rate of interest per period. This deposit is allowed to grow undisturbed while the interest is assumed to be re-invested.

•Future Value of a Lump Sum

Example:

Assume an amount of N1,000 is put in a fixed deposit account for 3 years at the rate of 12 percent per annum. If the amount left untouched, what will be the investment at the end of the third year?

•Future Value of a Lump Sum

Solution:

(i)   Step by Step Approach:

 Value at the end of year:

1: N1,000 (1,12) = N1,120.00

2: N1,000 (1,12)(1.12) = N1,000 (1,12)^2

$= $ N1,254.40

3: N1,000 (1,12)(1.12)(1.12) = N1,000 (1,12)^3

$= $ N1,404.93

•Future Value of a Lump Sum

Solution:

(ii) Generalized Formula:

$FV_n = P_o(1+r)^n$. If the original investment were allowed to grow for ten years, its worth at the end of year ten would be:

$FV_{10} = N1,000(1.12)^{10}$

$= N3,105.85$

Double your Money: Rules of Thumb

Rule 72: This rule says 72 should be divided by the interest rate to find the number of years it will take to double an amount of money. Alternatively, the rule helps to obtain the rate of interest that an amount of money must earn if the money is to double during a given number of years.

- Double your Money: Rules of Thumb

For example, if interest rate on savings account is 8%, it will take 9 years to double the money saved.

Rule 7-10: This rule says that money will double in 10 years if interest rate is 7%; and in 7 years if interest rate is 10%.