IQRA National University

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Q#1 Time value of money is one of the important concepts in any business. While considering the concept of time value of money, please introduce term discounting and compounding in detail.

Time Value of Money:

Time value of money is the first and one of the important lessons one should learn in finance. It can be used to compare investment alternatives and to solve problems involving loans, saving. The time value of money draws from the possibility that rational investors want to get money today rather then some measure of money later on. The time value of money (TVM) is the idea that money you have now is worth more than the indistinguishable entirety later on because of its latent capacity winning limit. This center rule of account holds that gave money can procure premium, any measure of money is worth more the sooner it is gotten. TVM is likewise sometimes alluded to as present limited value. The time value of money draws from the possibility that rational investors want to get money today instead of a similar measure of money later on as a result of money's capability to develop in value over a given timeframe. For instance, money stored into a savings account earns a specific loan fee and is thusly supposed to compound in value.

- Time value of money is based on the idea that people would rather have money today than in the future.
- Given that money can earn compound interest, it is more valuable in the present rather than the future.
- The formula for computing time value of money considers the payment now, the future value, the interest rate, and the time frame.
- The number of compounding periods during each time frame is an important determinant in the time value of money formula as well.

The formula for finding future value is following:

$$\mathbf{FV = PV \times [\ 1 + (i / n)\ ]^{(n \times t)}}$$

The formula for finding future value are following:

a) FV= PV(FVIFi,n)

Where FV is future value

PV is present value

I is interest rate

N is number of time units

(FVIFi,n) is interest factor

The formula for finding present value are following:

1) PV= FV(PVIFi,n)
2) PV= FV(1/1+i)n

Where PV is present value

FV is future value

I is interest factor

n is number of times unit.

Time Value of Money Examples

Assume a sum of $10,000 is invested for one year at 10% interest. The future value of that money is:

FV = $10,000 x (1 + (10% / 1) ^ (1 x 1) = $11,000

The formula can also be rearranged to find the value of the future sum in present day dollars. For example, the value of $5,000 one year from today, compounded at 7% interest, is:

PV = $5,000 / (1 + (7% / 1) ^ (1 x 1) = $4,673

1) **Compounding:**

Compounding is a technique based on time value of money in which we find the value at some future time of a present amount of money. If we invest some money today, what will be the amount we get at a future date.

For understanding the idea of compounding, above all else, we have to think about the term future value. The money you contribute today will develop and gain

enthusiasm on it, after a specific period, which will naturally change its value in future. So the value of the interest in future is known as its Future Value. Compounding alludes to the way toward procuring enthusiasm on both the chief sum, just as gathered enthusiasm by reinvesting the whole add up to create more premium.

Compounding is generally standard on account of intravenous/parenteral drug, normally by clinic drug specialists, but at the same time is offered by exclusive compounding drug stores and certain retail drug stores for different types of prescription. Regardless of whether standard or uncommon, intravenous or oral, and so forth., when a given medication item is made or changed to have qualities that are explicitly endorsed for an individual patient, it is known as "conventional" compounding.

Because of the increasing expense of compounding and the deficiency of medications, numerous emergency clinics have demonstrated an inclination to depend more upon enormous scope compounding drug stores to meet their standard prerequisite, especially of clean injectable meds.

When compounding is done on mass creation of a given detailing instead of patient-explicit creation, it is known as "non-customary" compounding (which, as talked about underneath, is ostensibly not "compounding" but instead "fabricating"). This advancement raises worries about patient wellbeing and presents a defense for appropriate administrative control and checking.

Discounting Formula is FV = PV (1 + r)^n

2) **Discounting:**

Discounting is also based on time of money in which we find the present value of some future amount of money. What should be the amount we need to invest today, to get a specific amount in future. Discounting is the process of converting the future amount into its Present Value. Now we may wonder what the present value is. The current value of the given future value is known as Present Value. The discounting technique helps to ascertain the present value of future cash flows by applying a discount rate. The following formula is used to know the present value of a future sum:

Discounting Formula PV= FV / (1 + r)^n

Present Value = $\frac{\mathbf{FV_1}}{} + \frac{\mathbf{FV_2}}{} + \frac{\mathbf{FV_3}}{} + \ldots\ldots\ldots + \frac{\mathbf{FVn}}{}$

$$(1+R)^1 \quad (1+R)^2 \quad (1+R)^3 \qquad\qquad (1+R)^4$$

Where 1,2,3,…..n represents future years
FV = Cash flows generated in different years,
R = Discount Rate

For calculating the present value of single cash flow and annuity the following formula should be used:

Discounting is the process of determining the present value of a payment or a stream of payments that is to be received in the future. Given the time value of money, a dollar is worth more today than it would be worth tomorrow. Discounting is the primary factor used in pricing a stream of tomorrow's cash flows

Term Discounting is a money related instrument in which an indebted person gets the option to defer installments to a leaser, for a characterized timeframe, in return for a charge or expense. Basically, the gathering that owes money in the current buys the option to postpone the installment until some future date. The rebate, or charge, is the contrast between the first sum owed in the present and the sum that must be paid later on to settle the obligation. The markdown is normally connected with a rebate rate, which is additionally called the rebate yield. The markdown yield is the corresponding portion of the underlying sum owed (starting risk) that must be paid to defer installment for 1 year.

Q#2 What do we meant by annuity in time value of money. Explain the concept of annuity in both perspectives annuity due and ordinary aunty explain it with formulas how to calculate annuity due and ordinary annuity.

Answer:

Annuity in Time Value of Money:

An annuity is a stream of equal periodic cash flows, over a specified time period. These cash flows are usually annual but can occur at other intervals, such as monthly (rent, car payments). The cash flows in an annuity can be inflows (the $3,000 received at the end of each of the next 20 years) or outflows (the $1,000 invested at the end of each of the next 5 years).

The current value of an annuity alludes to how much money would be required today to support a progression of future annuity installments. As a result of the time value of money, an aggregate of money got today is worth more than a similar whole sometime not too far off.

There are two basic types of annuities. For an ordinary annuity, the cash flow occurs at the end of each period. For an annuity due, the cash flow occurs at the beginning of each period.

Two Types of Annuities

Annuities, in this sense of the word, break down into two basic types: ordinary annuities and annuities due.

Ordinary annuities:

An ordinary annuity makes (or requires) payments at the end of each period. For example, bonds generally pay interest at the end of every six months. Rather than calculating each payment individually and then adding them all up, however, you can use the following formula, which will tell you how much money you'd have in the end. An ordinary annuity is a series of equal payments made at the end of consecutive periods over a fixed length of time. While the payments in an ordinary annuity can be made as frequently as every week, in practice, they are generally made monthly, quarterly, semi-annually, or annually. The opposite of an ordinary annuity is an annuity due, in which payments are made at the beginning of each period.

Examples of ordinary annuities are interest payments from bonds, which are generally made semi-annually, and quarterly dividends from a stock that has maintained stable payout levels for years. The present value of an ordinary annuity is largely dependent on the prevailing interest rate.

Calculating the Future Value of an Ordinary Annuity:

Future value (FV) is a measure of how much a series of regular payments will be worth at some point in the future, given a specified interest rate. So, for example, if you plan to invest a certain amount each month or year, it will tell you how much you'll have accumulated as of a future date. If you are making regular payments on a loan, the future value is useful in determining the total cost of the loan.

Consider, for example, a series of five $1,000 payments made at regular intervals. Because of the time value of money the concept that any given sum is worth more now than it will be in the future because it can be invested in the meantime—the first $1,000 payment is worth more than the second, and so on. So, let's assume that you invest $1,000 every year for the next five years, at 5% interest. Below is how much you would have at the end of the five-year period.

You can calculate the present or future value for an ordinary annuity or an annuity due using the following formulas.

FV Ordinary Annuity=C×[(1+i)n -1/ i]

where:

C=cash flow per period

i=interest rate

n=number of payments

Using the example above, here's how it would work:

FV Ordinary Annuity =$1,000×[(1+0.05)5−1 / 0.05]

=$1,000×5.53

=$5,525.63

Calculating the Present Value of an Ordinary Annuity:

In contrast to the future value calculation, a present value (PV) calculation tells you how much money would be required now to produce a series of payments in the future, again assuming a set interest rate.

This is the applicable formula:
PV Ordinary Annuity=C×[1−(1+*i*)−*n*/ *i*]

If we plug the same numbers as above into the equation, here is the result:

PV Ordinary Annuity=$1,000×[1−(1+0.05)−5//0.05]

=$1,000×4.33

=$4,329.48

Annuities due:

With an annuity due, by contrast, payments come at the beginning of each period. Rent, which landlords typically require at the beginning of each month, is a common example. Annuity due is an annuity whose payment is due immediately at the beginning of each period. A common example of an annuity due payment is rent, as landlords often require payment upon the start of a new month as opposed to collecting it after the renter has enjoyed the benefits of the apartment for an entire month.

Calculating the Future Value of an Annuity Due:

An annuity due, you may recall, differs from an ordinary annuity in that the annuity due's payments are made at the beginning, rather than the end, of each time period. The reason the values are higher is that payments made at the beginning of the period have more time to earn interest. For example, if the $1,000 was invested on January 1 rather than January 31 it would have an additional month to grow.

The formula for the future value of an annuity due is as follows:

FV Annuity Due$=C\times [(1+i)n-1/ i] \times(1+i)$

Here, we use the same numbers, as in our previous examples:

FV Annuity Due$=\$1,000\times [(1+0.05)5-1/0.05]\times(1+0.05)$

$=\$1,000\times5.53\times1.05$

=$5,801.91

Calculating the Present Value of an Annuity Due:

Similarly, the formula for calculating the present value of an annuity due takes into account the fact that payments are made at the beginning rather than the end of each period. For example, you could use this formula to calculate the present value of your future rent payments as specified in your lease. Let's say you pay $1,000 a month in rent. Below, we can see what the next five months would cost you, in terms of present value, assuming you kept your money in an account earning 5% interest.

This is the formula for calculating the present value of an annuity due:

PV Annuity Due=C× [1−(1+*i*)−*n*/ *i*]×(1+*i*)

So, in this example:

PV Annuity Due=$1,000×[(1−(1+0.05)−5/0.05]×(1+0.05)

=$1,000×4.33×1.05

=$4,545.95.

Q#3 Capital budgeting is one of the important elements while considering strategic decision making. What are the basic steps that we should consider while considering capital budgeting decision making? Explain the five steps in detail.

Answer:

Capital Budgeting:

Capital budgeting is the process of evaluating and selecting long-term investments that are consistent with the firm's goal of maximizing owner wealth. Firms typically make a variety of long-term investments, but the most common for the manufacturing firm is in fixed assets, which include property (land), plant, and equipment. These assets, often referred to as earning assets, generally provide the basis for the firm's earning power and value. Capital budgeting is a multi-step process organizations use to decide how beneficial an undertaking or speculation will be. An organization may utilize capital budgeting to make sense of on the off chance that it ought to grow its stockroom offices, put resources into new gear, or burn through money on particular worker preparing. All that you have to think about the procedure of capital budgeting. Capital budgeting is a procedure by which organizations survey how to finance activities and new pursuits through development and the board of advantages. This includes a progression of moves or steps made to accomplish most ideal returns. This procedure includes the determination of those new speculation proposition introduced to a firm that will

contribute most to the riches boost of the investors. The capital budgeting process consists of five distinct but interrelated steps.

1. **Proposal generation.** New projects are continually proposed within the firm as various departments or divisions offer input on new projects to consider. Proposals are made at all levels within a business organization and are reviewed by finance personnel. Proposition that require huge expenses are more deliberately examined than less exorbitant ones. For some random activity, an organization will most likely have various alternatives to consider. For instance, if an organization is looking to grow its warehousing offices, it may pick between including to its present structure or buying a bigger space in another area. Accordingly, every alternative must be assessed to perceive what makes the most monetary and strategic sense. When the most doable open door is recognized, an organization ought to decide the ideal time to seek after it, remembering components, for example, business need and forthright expenses.

2. Review and analysis. Formal review and analysis is performed to assess the appropriateness of proposals and evaluate their economic viability. Once the analysis is complete, a synopsis report is submitted to chiefs. Request that departmental staff gauge the working expenses for the undertakings that appear to be generally encouraging considering the market estimate. For example, discover from the designing division what new gear, supplies and different costs are vital for an examination venture. Next, have the accounting or buying office to affirm these working costs.

3. Decision making. Firms typically delegate capital expenditure decision making on the basis of dollar limits. Generally, the board of directors must authorize expenditures beyond a certain amount. Often plant directors are offered position to settle on choices important to keep the creation line moving. This procedure may require both interior and outer exploration. On the off chance that an organization is hoping to update its PC gear, for example, it may ask its IT office the amount it would cost to purchase new memory for its current machines while at the same time estimating out the expense of new PCs from an outside source. The organization should then endeavor to additionally limit the expense of executing whichever choice it picks.

4. Implementation. Following approval, expenditures are made and projects implemented. Expenditures for a large project often occur in phases. If a company

chooses to move forward with a project, it will need an implementation plan. The plan should include a means of paying for the project at hand, a method for tracking costs, and a process for recording cash flows or benefits the project generates. The implementation plan should also include a timeline with key project milestones, including an end date if applicable.

5. Follow-up. Results are monitored, and actual costs and benefits are compared with those that were expected. Action may be required if actual outcomes differ from projected ones. After a venture has been actualized, it ought to be observed after some time. The task's real expenses and advantages ought to be contrasted and the appraisals made before the undertaking was executed. The checking procedure may identify blunders in the past estimation of the task's incomes. On the off chance that any blunders are recognized, the representatives who were liable for venture assessment ought to be educated regarding the issue with the goal that future undertakings can be assessed all the more precisely. Besides, observing can help decide whether and when a venture ought to be surrendered (exchanged) by the firm.

Q#4 Introduce the different cash flows that any business activity has while doing any business (Initial investment, operating cash flow and terminal cash flow). How we have to calculate it while going for replacement of existing asset.

Answer:

Cash Flow:

Cash flow is the increase or decrease in the amount of money a business, institution or individual has. In finance, the term is used to describe the amount of cash that is generated or consumed in a given time period. There are many types of CF, with various important uses for running a business and performing financial analysis. There are several types of cash flow, so its important to have a solid understanding of what each of them is. When someone refers to CF, they could mean any of the types listed below, so be sure to clarify which cash term is being used.

The different cash flow that any business activity has doing:

a) **Initial investment:**

The relevant cash flow outflow for a proposed project at time zero. This category on the statement of cash flows is referred to as Cash Flow from Investing Activities and reports changes in capital expenditures and long-term investments. Capital expenditures refer to the purchase of property, plant, or equipment assets. Long-term investments may include debt and equity instruments of other companies. Another important item found here is acquisitions of other businesses. A key to remember is that a change in the long-term assets in the balance sheet is reported in the investing activities of the cash flow statement.

Investments in Property and Equipment

These investments might mean purchases of new office equipment such as computers and printers for a growing number of employees, or the purchase of new land and a building to house business operations and logistics of the company. These items are necessary to keep the company running. These investments are a cash outflow, and therefore will have a negative impact when we calculate the net increase in cash from all activities.

Formula:

Initial investment= Initial investment needed to acquire new asset – After-tax inflows from liquidation of old asset.

b) Operating cash flows:

The incremental after tax cash inflow resulting from implementation of a project during its life. The cash flow statement begins with Cash Flow from Operating Activities. It starts with net income or loss, followed by additions to or subtractions from that amount to adjust the net income to a total cash flow figure. What is added or subtracted are changes in the account balances of items found in current assets and current liabilities on the balance sheet, as well as non-cash accounts (e.g., stock-based compensation). We then arrive at the cash version of a company's net income.

Net Earnings

This amount is the bottom line of an income statement. Net income or earnings shows the profitability of a company over a period of time. It is calculated by taking

total revenues and subtracting from them the COGS and total expenses, which includes SG&A, Depreciation and Amortization, interest, etc.

PLUS: Depreciation and Amortization (D&A)

The value of various assets declines over time when used in a business. As a result, D&A are expenses that allocate the cost of an asset over its useful life. Depreciation involves tangible assets such as buildings, machinery, and equipment, whereas amortization involves intangible assets such as patents, copyrights, goodwill, and software. D&A reduces net income in the income statement. However, we add this back into the cash flow statement to adjust net income because these are non-cash expenses. In other words, no cash transactions are involved.

Less: Changes in working capital

Working capital represents the difference between a company's current assets and current liabilities. Any changes in current assets (other than cash) and current liabilities affect the cash balance in operating activities.

Formula:

Operating cash flow= operating cash inflows from new asset – Operating cash inflows from old asset.

c) Terminal cash flow:

The after tax non operating cash flow occurring in the final year of a project. It is usually attributable to liquidation of the project. Terminal cash flow is the net cash flow that occurs at the end of a project and represents the after-tax proceeds from disposal of the project assets and recoupment of working capital.

Terminal cash flow has two main components:

- Proceeds from disposal of project equipment, and
- cash flows associated with reversion of working capital to the level that prevailed before the start of the project.

Terminal cash flow is an important input in the capital budgeting process. While uniform periodic net cash flows are discounted using the present value for

annuity formula, terminal cash flow is treated separately from other cash flows and discounted using the present value of a single sum formula.

Formula:

Terminal cash flow= after-tax cash flows from termination of new asset – after-tax cash flows from termination of old asset