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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.

Solution

First of all we will understand introduce of discounting and compounding e.g Meaning, Concept, and Definition etc and then to discuss in detail

Term Discounting Meaning

The method used to determine the present value of future cash flows is known as Discounting.

Concept of Discounting

What should be the amount we need to invest today, to get a specific amount in future.

Definition of Discounting

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 $PV = FV / (1 + r)^n$

$$\text{Present Value} = \frac{FV_1}{(1+R)^1} + \frac{FV_2}{(1+R)^2} + \frac{FV_3}{(1+R)^3} + \dots + \frac{FV_n}{(1+R)^4}$$

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 in detail

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 financial mechanism in which a debtor obtains the right to delay payments to a creditor, for a defined period of time, in exchange for a charge or fee. Essentially, the party that owes money in the present purchases the right to delay the payment until some future date. The discount, or charge, is the difference between the original amount owed in the present and the amount that has to be paid in the future to settle the debt.

The discount is usually associated with a discount rate, which is also called the discount yield. The discount yield is the proportional share of the initial amount owed (initial liability) that must be paid to delay payment for 1 year.

Meaning of Compounding

The method used to determine the future value of present investment is known as Compounding.

Concept of Compounding

If we invest some money today, what will be the amount we get at a future date.

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

Definition of Compounding

For understanding the concept of compounding, first of all, we need to know about the term future value. The money you invest today will grow and earn interest on it, after a certain period, which will automatically change its value in future. So the worth of the investment in future is known as its Future Value. Compounding refers to the process of earning interest on both the principal amount, as well as accrued interest by reinvesting the entire amount to generate more interest.

Compounding Detail

Compounding is most routine in the case of intravenous/parenteral medication, typically by hospital pharmacists, but is also offered by privately owned compounding pharmacies and certain retail pharmacies for various forms of medication. Whether routine or rare, intravenous or oral, etc., when a given drug product is made or modified to have characteristics that are specifically prescribed for an individual patient, it is known as "traditional" compounding.

Due to the rising cost of compounding and the shortage of drugs, many hospitals have shown a tendency to rely more upon large-scale compounding pharmacies to meet their regular requirement, particularly of sterile-injectable medications.

When compounding is done on bulk production of a given formulation rather than patient-specific production, it is known as "non-traditional" compounding (which, as discussed below, is arguably not "compounding" but rather "manufacturing"). This development raises concerns about patient safety and makes a case for proper regulatory control and monitoring.

Q#2

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

Solution

What is meant by annuity in time value of money?

Regular payments, such as the rent on an apartment or interest on a bond, are sometimes referred to as "annuities." ... The future value of an annuity is the total value of payments at a specific point in time. The present value is how much money would be required now to produce those future payments.

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 present value of an annuity refers to how much money would be needed today to fund a series of future annuity payments. Because of the time value of money, a sum of money received today is worth more than the same sum at a future date.

Explain the concept of annuity in both perspectives annuity due and ordinary annuity explain it with formulas calculate annuity due and ordinary annuity

An annuity is a contract between we and an insurance company in which we make a lump-sum payment or series of payments and, in return, receive regular disbursements, beginning either immediately or at some point in the future.

A more simplistic way of expressing the distinction is to say that payments made under an ordinary annuity occur at the end of the period while payments made under an annuity due occur at the beginning of the period. ... Most annuities are ordinary annuities.

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 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.

(1) Ordinary Annuity

$$PVA_{k\%,n} = PMT \times (PVIFA_{i\%,n})$$

A $PVA_{7\%,3} = \$12,000 \times 2.624$

$$PVA_{7\%,3} = \$31,488$$

Calculator solution: \$31,491.79

B $PVA_{12\%,15} = \$55,000 \times 6.811$

$$PVA_{12\%,15} = \$374,605$$

Calculator solution: \$374,597.55

C $PVA_{20\%,9} = \$700 \times 4.031$

$$PVA_{20\%,9} = \$2,821.70$$

Calculator solution: \$2,821.68

(2) Annuity Due

$$PVA_{\text{due}} = PMT \times [(PVIFA_{i\%,n} \times (1 + k))]$$

$$\text{A} \quad PVA_{\text{due}} = \$12,000 \times (2.624 \times 1.07)$$

$$PVA_{\text{due}} = \$33,692$$

Calculator solution: \$33,696.22

$$\text{B} \quad PVA_{\text{due}} = \$55,000 \times (6.811 \times 1.12)$$

$$PVA_{\text{due}} = \$419,557.60$$

Calculator solution: \$419,549.25

$$\text{C} \quad PVA_{\text{due}} = \$700 \times (4.031 \times 1.20)$$

$$PVA_{\text{due}} = \$3,386.04$$

Calculator solution: \$3,386.01

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.

Solution

Capital Budgeting

Capital budgeting involves deciding what new projects a company should invest in. Business owners strive to determine which projects would yield the most return over a given period of time. For example, a business might weigh the benefits of starting a new product line, building a new plant or partnering with an overseas firm in a joint venture. Capital budgeting projects typically continue to earn money for the firm after one year.

Five Steps of Capital Budgeting

The five steps of capital budgeting are often described as exploring opportunities, estimating costs, determining the benefits, assessing any potential risk involved, and making the final decision.

Explore Opportunities

Discuss potential projects with your firm's major departments, Mark Hirschey advises in "Managerial Economics." Ask the accounting department how much money the firm can spend on new projects during the current year. Discuss market forecasts with the marketing

department to learn which types of investments are currently strongest. Also, discuss ideas for development with other departments such as engineering and research. Consider routine cost-reduction projects such as replacing old equipment, as well as expansion projects such as offering new services.

Estimating Costs

Ask departmental staff to estimate the operating costs for the projects that seem most promising in light of the market forecast. For instance, find out from the engineering department what new equipment, supplies and other expenses are necessary for a research project. Next, have the accounting or purchasing department to confirm these operating expenses.

Determining Benefits

You will need to estimate the cash flows – how much the firm expects to earn – from each proposed project. Determine the value of each project at a specific date, such as one year from its start. Subtract the project's cost from this amount to determine how much profit the company would earn, then compare the expected earnings from each project.

Assess Potential Risk

Estimate the risk involved with each project – how much the firm stands to lose if the project fails. Along with marketing staff and head staff from any departments involved with the project, estimate the likelihood of failure and success. Assign each project a percentage expressing likelihood of failure and a percentage expressing likelihood of success.

The Final Decision

Weigh the likelihood of failure against the estimated return for each investment. Pursue projects for which the likelihood of success outweighs the likelihood of failure, as long as their expected return makes them worthwhile investments. You and your accounting department must determine how much of a return makes an investment worthwhile for your firm. Ultimately you must also decide how much risk you're prepared to accept for a potentially profitable investment. This will depend on how diverse your investment portfolio is – if you have numerous low-risk investments, a high-risk investment might be worthwhile. Just make sure your firm could weather the loss of an investment.

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.

Solution

A **cash flow** statement is a financial statement that summarizes the amount of **cash** and **cash** equivalents entering and leaving a company. The **cash flow** statement measures how well a company manages its **cash** position, **meaning** how well the company generates **cash** to pay its debt obligations and fund its operating expenses.

Calculating Initial Investment

a. **Book value** = $(\$325,000 \times .48) = \$156,000$

b. **Sales price of old equipment** \$200,000

Book value of old equipment \$156,000

Recapture of depreciation \$ 44,000

Taxes on recapture of depreciation = $\$44,000 \times .40 = \$17,600$

After-tax proceeds = $\$200,000 - \$17,600 = \$182,400$

c. **Cost of new machine** \$325,000

Less sales price of old machine (200,000)

Plus tax on recapture of depreciation 44,000

Initial investment \$169,000

Calculation of Operating Cash Flow

Year	Old Machine					
	(1)	(2)	(3)	(4)	(5)	(6)
PBDT	\$14,000	\$16,000	\$20,000	\$18,000	\$14,000	\$ 0
Depreciation	<u>6,000</u>	<u>6,000</u>	<u>2,500</u>	<u>0</u>	<u>0</u>	<u>0</u>
NPBT	\$ 8,000	\$10,000	\$17,500	\$18,000	\$14,000	0
Taxes	<u>3,200</u>	<u>4,000</u>	<u>7,000</u>	<u>7,200</u>	<u>5,600</u>	<u>0</u>
NPAT	\$4,800	\$ 6,000	\$10,500	\$10,800	\$ 8,400	\$ 0
Depreciation	<u>6,000</u>	<u>6,000</u>	<u>2,500</u>	<u>0</u>	<u>0</u>	<u>0</u>
Cash flow	<u>\$10,800</u>	<u>\$12,000</u>	<u>\$13,000</u>	<u>\$10,800</u>	<u>\$ 8,400</u>	<u>\$ 0</u>

New Machine

Year	(1)	(2)	(3)	(4)	(5)	(6)
PBDT	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000	\$ 0
Depreciation	<u>16,000</u>	<u>25,600</u>	<u>15,200</u>	<u>9,600</u>	<u>9,600</u>	<u>4,000</u>
NPBT	\$14,000	\$ 4,400	\$14,800	\$20,400	\$20,400	-\$4,000
Taxes	<u>5,600</u>	<u>1,760</u>	<u>5,920</u>	<u>8,160</u>	<u>8,160</u>	<u>-1,600</u>
NPAT	\$ 8,400	\$ 2,640	\$ 8,880	\$12,240	\$12,240	-\$2,400
Depreciation	<u>16,000</u>	<u>25,600</u>	<u>15,200</u>	<u>9,600</u>	<u>9,600</u>	<u>4,000</u>

Cash flow \$24,400 \$28,240 \$24,080 \$21,840 \$21,840 \$1,600

Terminal Cash Flow Calculation:

**After-tax proceeds from sale of new asset = Proceeds from sale of new asset
± Tax on sale of new asset After-tax proceeds from sale of old asset
= Proceeds from sale of old asset
± Tax on sale of old asset
± Change in net working capital
= Terminal cash flow**