Time value of money assignment

Business

Time Value of Money (TVM), developed by Leonardo Fibonacci in 1202, is an important concept in financial management. It can be used to compare investment alternatives and to solve problems involving loans, mortgages, leases, savings, and annuities. TVM is based on the concept that a dollar today is worth more than a dollar in the future. That is mainly because money held today can be invested and earn interest. A key concept of TVM is that a single sum of money or a series of equal, evenly-spaced payments or receipts promised in the future can be converted to an equivalent value today.

Conversely, one can determine the value to which a single sum or a series of future payments will grow to at some future date. The time value of money serves as the foundation for all other notions in finance. It impacts business finance, consumer finance and government finance. Time value of money results from the concept of interest. Key Components of Time Value of Money Present Value is an amount today that is equivalent to a future payment, or series of payments, that has been discounted by an appropriate interest rate.

The future amount can be a single sum that will be received at the end of the last period, as a series of equally-spaced payments (an annuity), or both. Since money has time value, the present value of a promised future amount is worth less the longer the waiting time to receive it. PV = FV [1/(1+i) n] FV = Future Value PV = Present Value i = the interest rate per period n= the number of compounding periods Future Value is the exact opposite of the present value. It is the amount of money that an investment with a fixed, compounded interest rate will grow to by some future date.

The investment can be a single sum deposited at the beginning of the first period, a series of equally-spaced payments (an annuity), or both. Since money has time value, it is expected that the future value will be greater than the present value. The difference between the two depends on the number of compounding periods involved and the going interest rate. FV= PV (1 + i)n The time value of money is based on the concept that the same amount of money today does not equal the same amount in the future. As a result, the investing party expects some kind of ‘ reward’ when lending, depositing money in a bank account or making similar investment.

This ‘ reward’ is called interest. The interest money can earn is the difference between money received today and in the future. For example, $1 received today will be worth $1. 10 in a year’s time and the present value of $1. 10 to be received one year from now is $1. TVM also takes into account risk aversion – both default risk and inflation risk. There is virtually no risk if one has the money in hand and is not anticipating the future receipt of money from an investment. In 5 years that money could be worthless or not returned to the investor.

Also, because of the effects of inflation, money in hand today will purchase more goods or services than money in the future. There is a residual time value of money, beyond compensation for default and inflation risk that represents simply the preference for consumption now versus later. As mentioned earlier, the Time Value of Money concept is broadly accepted and used by both the corporation and private consumer alike. Commercial banks and financial providers use TVM applications to determine and manage their cash flow and credit management.

They also use the TVM concept to determine the deposit rate and lending rate for loan programs. Another example of the application of time value of money in commercial banks is through mortgages. Using the formula for the present value of an annuity, a bank will solve the formula to determine the monthly mortgage payment. Part of each payment is applied towards interest and any remainder is used to reduce the principal. As the balance of the loan is gradually reduced, a progressively larger portion of each payment goes toward reducing the principal.

Credit card financial service companies are commonly known to issue private student loans. Therefore, credit card companies would use the time value of money to determine loan payment schedules and the ending balance, the future value of the loan. Credit card companies would use the formula for present value of an annuity to determine the payment schedule, and they would use the formula for future value of an annuity to determine how much money the student will end up paying the credit card company at the end of the student loan.

Insurance companies use Time Value of Money applications to determine and manage their cash flow and reserve to make sure they are prepared to cover their customers’ insurance claims at a certain point in time. Another way insurance companies make use of time value of money is by earning investment income on premiums between the time of receipt and the time of payment of claims or benefits. State Governments and Retirement Plan financial service providers use TVM to prepare the amount of money needed for a certain period of time, and the Retirement plan can be adjusted accordingly from time to time.

TVM is also used by individuals as it helps one to measure the trade-off in spending and saving. This can have important consequences for their personal budgeting. If market interest rates are at 5%, one may decide that the time value of money is greater in the future, and decide to invest. If rates are 2%, one may decide that the time value of money is higher today, and choose to spend. References: Arnold, Glen. (1998). Corporate Financial Management, 1st ed.

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