Jan 6, 2025

LEC 01 - Chapter 1: Introduction

Learning Objectives:

- Analyze the process for making personal financial decisions
- Develop personal financial goals
- Assess economic factors that influence personal financial planning
- Determine personal and financial opportunity costs associated with personal financial decisions

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Activity 1: Look up the following key terms

Annuity: An annuity is a contract that's issued and distributed by an insurance company and bought by individuals. The insurance company pays out a fixed or variable income stream to the purchaser beginning right away or at some time in the future in exchange for premiums they've paid. It's not the same as a life insurance policy that only pays benefits when the insured dies.

Compounding: Compounding is the process in which an asset's earnings, from either capital gains or interest, are reinvested to generate additional earnings over time. This growth, calculated using exponential functions, occurs because the investment will generate earnings from both its initial principal and the accumulated earnings from preceding periods.
Compounding, therefore, differs from linear growth, where only the principal earns interest each period.

Inflation: Inflation is a gradual loss of purchasing power that is reflected in a broad rise in prices for goods and services over time. The inflation rate is calculated as the average price increase of a basket of selected goods and services over one year. High inflation means that prices are increasing quickly, while low inflation means that prices are growing more slowly. Inflation can be contrasted with deflation, which occurs when prices decline and purchasing power increases.

Liquidity: Liquidity refers to the efficiency or ease with which an asset or security can be converted into ready cash without affecting its market price. The most liquid asset of all is cash itself. Consequently, the availability of cash to make such conversions is the biggest influence on whether a market can move efficiently.
The more liquid an asset is, the easier and more efficient it is to turn it back into cash. Less liquid assets take more time and may have a higher cost.

Opportunity Cost: Opportunity cost represents the potential benefits that a business, an investor, or an individual consumer misses out on when choosing one alternative over another.
While opportunity costs can't be predicted with total certainty, taking them into consideration can lead to better decision making.

Time value of money: The time value of money is a financial concept that holds that the value of a dollar today is worth more than the value of a dollar in the future. This

LEC 01 - Chapter 1: Introduction

is true because money you have now can be invested for a financial return, also the impact of inflation will reduce the future value of the same amount of money.

Rule of 72: The Rule of 72 is a quick, useful formula that is popularly used to estimate the number of years required to double the invested money at a given annual rate of return. Alternatively, it can compute the annual rate of compounded return from an investment, given how many years it will take to double the investment.
While calculators and spreadsheet programs like Microsoft Excel have functions to accurately calculate the precise time required to double the invested money, the Rule of 72 comes in handy for mental calculations to quickly gauge an approximate value. For this reason, the Rule of 72 is often taught to beginning investors as it is easy to comprehend and calculate. The Security and Exchange Commission also cites the Rule of 72 in grade-level financial literacy resources.

Influence of Economic Factors on Personal Financial Planning:

Money Supply: Measures dollars available for spending in economy

Unemployement Rate: Measures number of people without employment who are willing and able to work

Housing Starts: Measures the number of new homes being built

Gross Domestic Product (GDP): Measures the value of goods and services produced within a countries borders including items produced with foreign resources

Trade Balance: Measures the difference between a country's exports and imports

S&P/TSX composite index and other stock market indexes: Measures the relative value of stocks represented by the index

- To find out how fast prices double, use the Rule of 72: Divide 72 by the annual inflation / interest rate
    - Ex. An annual inflation rate of 8% means prices will double in 9 years
      $$72 \div 8 = 9$$
- We can use Microsoft Excel to calculate the future value of an investment / annuity with the $FV()$ formula
    - $= FV(Interest\ Rate,\ Time,\ Annuity\ Payment,\ Principle,\ 0/1\ for\ start/end\ of\ year)$

Opportunity Costs and the Time Value of Money:

Opportunity Cost: What a person gives up by making a choice

Jan 6, 2025

LEC 01 - Chapter 1: Introduction

Personal Opportunity Costs:

- **Time**, when used for one activity can't be used for another activity
- **Health**, poor eating habits, lack of sleep, exercise, etc. can result in time away from work or school, increased health costs, and reduced financial security

Financial Opportunity Costs:

- **Time value of money**: increases in an amount of money because of interest earned
  - When you spend, save, invest, or borrow, you should consider the time value of that money as an opportunity cost
  - Setting aside funds in a savings plan with little or no risk has the opportunity cost of potentially higher returns from an investment with greater risk

Interest Calculations:

- Three amounts are used to calculate the time value of money for savings in the form of interest earned
  1. Amount of savings (Principle) $\rightarrow P$
  2. Annual interest rate $\rightarrow R$
  3. Length of time the money is deposited $\rightarrow T$
- There are two methods of calculating interest
  1. Simple Interest $\rightarrow I = P \cdot R \cdot T$
     - Interest compounded on the principle, excluding previously earned (constant principle)
     - Linear growth
  2. Compound Interest $\rightarrow I = P(R)^T$
     - Assuming T is the also the number of compounding periods
     - Each time interest is added to the principle, the next interest is computed on the new balance (interest reinvested / added to principal)
     - Exponential growth

Future Value of a Single Amount: Deposited money earns interest that increases over time

- **Future Value**: The amount to which current savings will increase based on a certain interest rate and time period
  - Future value computations typically involve compounding
  - Compounding allows the future value of a deposit to grow faster

Jan 6, 2025

LEC 01 - Chapter 1: Introduction

Future Value of a Series of Deposits:

Annuity: A series of equal amount (deposits or withdrawals) made at regular time intervals

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Present Value of a Single Amount:

- The current value of a future amount based on a certain interest rate and a certain time period
- Also called discounting
- Allows you to determine how much to deposit now to obtain a desired future amount
- Can be computed for single amounts or annuities (series of deposits)

Example 1: Miguel has 2 children who will start post secondary education in 10 years. He plans to set aside $\$1500\ /\ year$ for his childrens education during that period and estimates he will earn an annual interest rate of 5% on his savings. What amount can Miguel expect to have available when his children are ready to enrol.

- Future value calculation (Want to know how much money a present investment will be worth in 10 years)
  - Annuity
- Using Table method:
  - $1500 \cdot 12.578 = \$18,867.00$
- Using Excel:
  - $= FV(0.05,\ 10,\ -1500,\ 0,\ 0) \rightarrow \$18,866.84$

Components of Personal Financial Planning:

- *Obtaining* (Chapter 1)
- *Planning* (Chapters 2, 3)
- *Saving* (Chapter 4)
- *Borrowing* (Chapters 5, 6)
- *Spending* (Chapter 7)
- *Managing Risk* (Chapters 8, 9)
- *Investing* (Chapters 10-13)
- *Retirement and Estate Planning* (Chapters 14, 15)

Jan 6, 2025

LEC 01 - Chapter 1: Introduction

Problem 1: *Calculating Future Value of Property.* Lenny Big Canoe plans to buy a house for $\$565,000$. If that real estate property is expected to increase in value by 5% each year, what will its approximate value be seven years from now

- Using Excel:
  $= FV(0.05,\ 7,\ 0,\ -565000,\ 0) \rightarrow \$795,011.74$

Problem 10: *Exploring Other Time Values of Money Applications.* Using time value of money tables or a financial calculator, calculate the following:

a) The future value of $\$450,\ 6$ years from now at 7%
   - Using Excel:
     $= FV(0.07,\ 6,\ 0,\ -450,\ 0) \rightarrow \$675.33$

b) The future value of $\$800$, saved each year for 10 years at 8%
   - Using Excel:
     $= FV(0.08,\ 10,\ -800,\ 0,\ 0) \rightarrow \$11,589.25$

c) The amount you have to deposit today (present value) at a 6% interest rate to have $\$1000,\ 5$ years from now
   - Using Excel:
     $= PV(0.06,\ 5,\ 0,\ -1000,\ 0) \rightarrow \$747.26$

d) The amount you have to deposit today to be able to take out $\$500$ a year for 10 years from an account earning 8%
   - Using Excel:
     $= PV(0.08,\ 10,\ -500,\ 0,\ 0) \rightarrow \$3,355.04$