1 Review: Chapter 1 & Chapter 1 Appendix

1.1 Aggregate Output & Aggregate Income

Def^n: *GDP (Gross Domestic Product)* - The market value of all final goods and services produced in an economy during a specific period of time.

Def^n: *Aggregate Income* - Total income from the production of goods and services in an economy during a specific period of time.

Aggregate Income is usually considered to be equal to Aggregate Output (GDP) as every dollar spent in an economy eventually becomes someone else income.

1.2 Real vs. Nominal: GDP

The best way to see the difference between Real and Nominal values is by example. Suppose in 2015, our economy produced 10 million beers and sold them for \$1/beer.

$$\text{Nominal GDP} = \text{Current Year Output} \times \text{Current Year Prices}$$

Nominal GDP in 2015 would be \$10 Million (\$1×10 Million Beers). If price level doubled next year but the quantity of beers produced remained unchanged, Nominal GDP in 2016 would be \$20 Million (\$2×10 Million Beers). Although Nominal GDP has doubled in one year, we do not have the benefit of enjoying double the amount of beer. Thus, Nominal GDP gives misleading results. It is best to put GDP in real terms by holding the price level constant at the base year.

$$\text{Real GDP} = \text{Current Year Output} \times \text{Base Year Prices}$$

1.3 Aggregate Price Level

Def^n: *GDP Price Deflator* - Average price of all goods and services produced in an economy

$$GDP\ Price\ Deflator = \frac{Nominal\ GDP}{Real\ GDP} \times 100$$

Def^n: *CPI (Consumer Price Index)* - Average price of all goods and services contained in the market basket

The CPI is a better measure of price level that consumers are faced with. The market basket contains goods that a typical family of four would purchase.

1.4 Growth Rates

Often growth rates of GDP, the stock market, & inflation are reported in the news as percentage changes:

$$\text{growth rate of } x = \frac{x_t - x_{t-1}}{x_{t-1}} \times 100$$

For example, suppose the GDP Price Index (or CPI) has increased from 120 in 2013 to 125 in 2014.

$$\text{Inflation} = \frac{125 - 120}{120} \times 100 = 4\%$$

Correcting for Inflation

Using these price indices, we can correct for inflation. For example, in 1963 the price of a McDonalds hamburger was \$0.15 and the CPI was 30. In 2013 the CPI has increased to 230 and the price of a burger increased to \$1.

$$Value_{2013} = Value_{1963} \times \frac{CPI_{2013}}{CPI_{1963}} = \$0.15 \times \frac{230}{30} = \$1.15$$

1.5 Review of the Financial System

Def^n: *Financial Intermediaries* - Institutions that borrows funds from savers and makes loans to borrowers

Banks are the most common financial intermediary.

Def^n: *Financial Markets* - A market in which funds are transferred from savers to borrowers

Markets such as stock and bond markets promote economic efficiency by channeling funds from people who do not have productive use for them to people that do. Well functioning financial markets are key to promoting economic growth. Faulty financial markets is one reason why countries remain poor. Financial markets have direct effects on personal wealth, business behavior, and consumers.

Def^n: *Financial Security* - A claim on the issuer's future income/assets.

Although some think securities are financial jargon designed to make understanding them more difficult, a security is an asset that gives you the right to the issuer's income.

For example, Arian Foster is a prominiate NFL running back for the Houston Texans. He was the first football player to securitize himself. In other words, he sold a portion (20%) of his future earnings to an investor for $10 million today. This investor now has a finanical security giving him the right to 20% of every dollar Arian Foster makes in the future.

Def^n: *Bond* - A debt security that promises to make scheduled payments over a specified period of time

The bond market enables corporations and governments to borrow to finance activities because it is where interest rates are determined.

Def^n: *Interest Rate* - Cost of borrowing money or the benefit of saving money

Interest rates are important for many reasons. Changes affect not only how much we want to save but important life decisions like buying a home or a new car. They also impact how businesses decided to invest their money. It is important to note that although there are many types of interest rates found in an economy (e.g. Mortgages/Auto Loans/Student Loans/Savings Accounts/Bonds), they differ in magnitude because of risk level but all typically tend to move in unision. Economists commonly refer to "the interest rate" which lumps all of them together.

Def^n: *Common Stock* - A security representing a share of ownership in a corpoation giving the owner a claim to partial earnings of the corporation.

Issuing stock is a mechnisim companies use to raise funds to finance their activities. The stock market is where individuals and firms go to invest. It is extremely volatile which implies there is a potential for making & losing tons of money. (e.g. 10/19/1987 - Black Monday $\downarrow$ 22%). Businesses also make decisions regarding investment decisions depending on how the stock market is performing. During an upswing, businesses with higher prices of stock will issue more stock to finance investment projects.

1.6 Monetary Policy & Fiscal Policy

1.6.1 Monetary Policy

Involves manipulating the money supply to change interest rates. It is conducted by a nation's Central Bank. The Central Bank of the U.S. is known as "The Fed."

1.6.2 Fiscal Policy

Involves changes in federal government spending and taxes.

Def^n: *Balanced Budget* - Govt. spending equals what they take in

Def^n: *Budget Deficit* - Govt. spends more than it takes in

Def^n: *Budget Surplus* - Govt. takes in more than it spends

2 The Financial System

2.1 Function of Financial Markets

Shark Tank is a show on ABC that connects investors with inventors. One revolutionary product, UniKey, allowed keyless entry to your home as long as you had your smartphone in your pocket. It also incorporated a guest access feature allowing you to allow access to a dog walker/maid/babysitter/etc. for a specific time period. With this invention, the economy would be better off. Unfortunately, the inventor would not have the opportunity to introduce his product without financial assistance form the sharks.

Not everyone has the privilege to propose their idea to Mark Cuban and the other sharks on the TV show. Other inventors must connect with these investors through the financial system. Financial Markets perform the essential economic function of channeling funds from savers to borrowers which is shown in Figure 1.

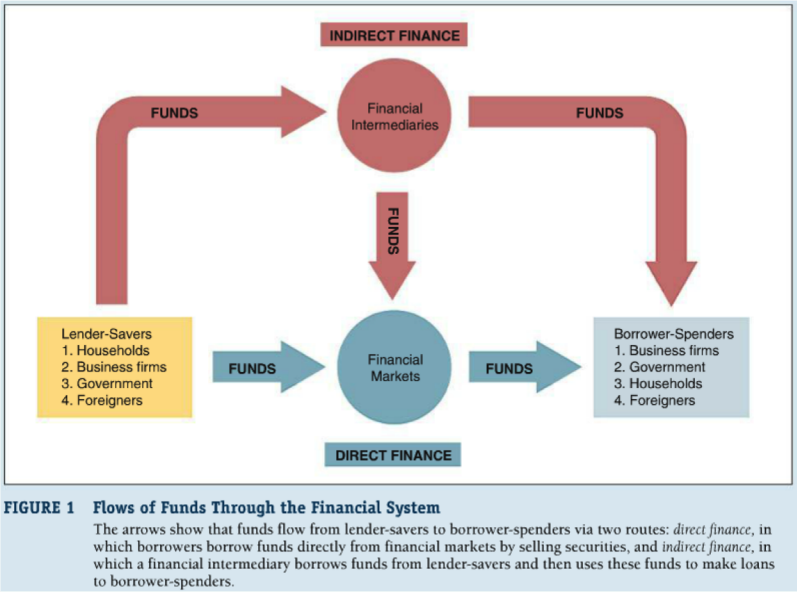


FIGURE 1 Flows of Funds Through the Financial System
The arrows show that funds flow from lender-savers to borrower-spenders via two routes: *direct finance*, in which borrowers borrow funds directly from financial markets by selling securities, and *indirect finance*, in which a financial intermediary borrows funds from lender-savers and then uses these funds to make loans to borrower-spenders.

Figure 1: Flows of Funds Through the Financial System

2.2 Structure of Financial Markets

There are several categorizations that make up the structure of Financial Markets.

Debt & Equity Markets

Firms and individuals can obtain funds in a financial market in two ways:

1. Debt Instrument (e.g Bond, Mortgage)
    - Contractual agreement by the borrower to pay the holder fixed dollar amounts at regular intervals (interest and payment) until a specified date of maturity
2. Equity Instrument (e.g Common Stock)
    - Claim to share the net income and assets of the business

Primary & Secondary Markets

Def^n: *Primary Market* - Financial market where new securities are issued and sold to initial buyers

Facebook went public (IPO) in Spring of 2012. It other words, Zuckerberg took a portion of his company and hired an Investment Bank to assist in the initial sale of FB securities.

Def^n: *Secondary Market* - Financial market where securities that have already been issued can be resold

If someone wanted to buy FB today, they would log onto their eTrade account and place a purchase order for some amount of FB stock. At this purchase, buyers are no longer buying directly from Zuckerberg but from holders of stock.

Exchanges & Over-the-Counter Markets

Secondary markets can be organized in two ways:

1. Exchanges (e.g. NYSE or Chicago Board of Trade)
2. OTC Market (e.g. Wolf of Wall Street)
   - Dealers at different locations who have an inventory of securities stand ready to buy and sell securities to anyone who comes to them.

Money & Capital Markets

An alternative way of distinguishing between markets is on the basis of the maturity of the securities traded

Def^n: *Money Market* - Financial market in which only short-term debt instruments (less than one year) are traded.

Money market instruments show very small price fluctuations. This is due to the lower risk that is associated with the short-term maturity. Example money market instruments are:

- U.S. Treasury Bills
  - Short-term debt instrument issued with 1/3/6 mo maturity used to finance Federal Govt.
  - Most liquid & safest money market instrument. (No possibility of default).
  - Sold at a discount and pay fixed amount at maturity without direct interest payments.
    e.g. Buy 6 mo. T-Bill for $900 that is redeemable for $1,000 six months later.
- Negotiable Bank CDs
  - Debt instrument sold by banks to depositors.
  - Pays annual interest and original amount on maturity date
  - Negotiable CDs are CDs that are sold on secondary markets
- Commercial Paper
  - Short-term debt instrument issued by large banks & well-known corporations
  - Typically firms like Walmart would issued CP to finance inventories
- Federal Funds
  - Short-term debt instrument that are typically overnight loans between banks
- Repurchase Agreements
  - Short-term loans (typically less than two weeks) where T-Bills serve as collateral.
  - Example: Apple has $10 million of idle funds in its bank account. Apple can use this money to buy T-Bills from bank who agrees to repurchase them next week at a higher price.

Def^n: *Capital Market* - Financial market in which longer-term debt (greater than on year) and equity instruments are traded. Example capital market instruments are:

- Stocks (Largest capital instrument – Valued at about $17 Trillion)
  - Equity claims on the net income and assets of a corporation
- Mortgages & Mortgage-Backed Securities
  - Mortgages are loans to households/firms to purchase land & housing which will serve as collateral
  - Mortgages are the largest debt market in the U.S. (Student Loans?)
  - Mortgage-Backed Securities are a bond like debt instrument backed by a bundle of mortgages
- Corporate Bonds
  - Long-term bonds issued by corporations with very strong credit ratings.
  - Typically, holders receive interest payments twice a year and pays the face value at maturity
- U.S. Govt. & Govt. Agency Securities
  - Long-term debt instruments issued by the U.S. Treasury to finance federal deficits.
- State & Local Bonds
- Consumer and Bank Commercial Loans

2.3 Internationalization of Financial Markets

Before the 1980s, U.S. financial markets were much larger than this outside the states. In recent ears the U.S. dominance has been disappearing. This growth as resulted from:

- Large increases in the pool of savings in foreign countries
- Deregulation of foreign financial markets

Because of this, American corporations do not have to rely solely on domestic capital markets for necessary funds. They can utilize international capital markets.

International Bond Market, Eurobonds, Eurocurrencies

Def^n: *Foreign Bonds* - Bonds that are sold in a foreign country and are denominated in that country's currency

For example, Audi sells bond in U.S. denominated in U.S. dollars.

Def^n: *Eurobond* - Bond denominated in a currency other than the country in which it is sold.

For example, a bond denominated in U.S. dollars sold in Canada

Def^n: *Eurocurrencies* - Foreign currencies deposited in banks outside the home country

Def^n: *Eurodollars* - A example Eurocurrency where U.S. dollars deposited in foreign banks outside the U.S. or in foreign branhes of U.S. banks.

Note: Eurobonds/Eurodollars/Eurocurrencies have nothing to do with the currency that the EU countries use. For example, a bond denominated in Euros, is called a Eurobond only if it is sold outside of the countries using the Euro. Most Eurobonds are denominated in U.S. dollars.

2.4 Function of Financial Intermediaries

An alternative way firms and individuals can obtain funds is indirectly through financial intermediaries.

Def^n: *Financial intermediation* - Primary route for moving funds from lenders to borrowers.

Although the mainstream media and news outlets focus on the stock markets, financial intermediaries are a more important source of funding for corporations that stock markets are. To understand why, we must understand the role of transaction costs, risk sharing, and information costs in financial markets.

Transaction Costs

Def^n: *Transaction Costs* - Time spent carrying out finanical transactions

For example, you have $1,000 to lend and your friend Marco the Drug dealer needs needs $1,000 for more drugs. You hire a lawyer for $500 to write up a contract that specifies the maturity date how much interest Marco will pay you. When you account for this transaction cost, you realize you will spend more money that you will earn. This is a prime example of how small savers/borrowers are unable to benefit from financial markets.

Def^n: *Economies of Scale* - The reduction in tranaction costs per dollar of transactions as the size of transactions increases

Financial intermediaries such as banks use their large size to take advantage of economies of scale. For example, continuing the above example, Banks hire a really good lawyer for $5,000 to make an airtight contract that they will use for all of their loans. This will reduce the transaction costs making it profitable for the bank to make the loan to Marco.

Lower transaction costs allow banks to provide their customers with liquidity services that make it easier for customers to conduct transactions.

Risk Sharing

Def^n: *Risk Sharing* - Financial Intermediaries reduce the risk exposure of investors by creating/selling assets with risk characteristics that fit peoples risk needs. This process also known as asset transformation.

Another form of risk sharing is Diversification where investors will spread funds over many assets in different sectors to reduce risk exposure.

Asymmetric Information

Def^n: *Asymmetric Information* - One party does not know enough about the other party to make accurate decisions

For example, a borrower who takes out a loan usually has better information about the potential returns and risk than the lender does. Asymmetric info creates two problems in the financial system:

1. Adverse Selection *(before transaction)*
    - This occurs when the potential borrowers who are most likely to produce undesirable result are the ones who most actively seek out loans and are most likely to be selected. This causes lenders to not make any loans even though good borrowers are out there.
        e.g. Uncle Mike the Carpenter & Uncle Joe the Gambler
2. Moral Hazard *(after transaction)*
    - In financial markets, this is the risk that the borrowers might engage in undesirable activities that lower the probability of replayment

Banks are extremely good at collecting information to minimize the probability of making a bad investment. This allows them to achieve economies of scope; that is, lower the cost of information production by applying information across multiple products.

2.5 Types of Financial Intermediaries

There are three categories of financial intermediaries:

1. Depository Institutions (Banks)

Def^n: *Depository Institutions* - Financial intermediaries that accept deposits from individuals and institutions and make loans

- Commercial Banks
  - Raise funds primarily by issuing checkable deposits, savings deposits, & time deposits.
  - Use funds to make loans (business/consumer/home) and buy U.S. govt. securities
- Saving and Loan Associations (about 800)
  - Raise funds through savings deposits (called shares) & time checkable deposits
  - Over time, loosened restrictions has blurred the link between S&Ls and Banks
- Credit Unions (about 8,000)
  - Rains funds from deposits called shares and make consumer loans
  - Typically very small lending institutions organized around a particular group: union members/etc.

2. Contractual Savings Institutions

Def^n: *Contractual Savings Institutions* - Aquire funds at periodic intervals on a contractual basis

- Life Insurance Companies (largest)
  - Aquire funds from premiums people pay to keep policy active.
  - Buy primarily corporate bonds & mortgages
- Fire & Casualty Insurance Companies
  - Aquire funds from premiums people pay to keep policy active.
  - Greater possibility of loss so they buy more liquid assets than life insurance companies
- Pension funds & Govt. retirement funds
  - Funds acquired automatically from employers and employees and provide retirement income
  - Buy corporate bonds and stocks. Serious Tax incentives.

3. Investment Intermediaries

- Finance Companies
  - Raise funds by selling commercial paper and issuing stocks and bonds
  - Lend to consumers for items such a cars, home projects, etc. (e.g. Ford Motor Credit Company)
- Mutual Funds
  - Raise funds by selling shares to individuals to purchase diversified portfolios of stocks and bonds
- Money Market Mutual Funds
  - Similar to Mutual funds, sell shares to raise money to purchase Money Market instruments
  - Shareholders can write checks against shareholdings functioning as a checking account
- Investment Banks
  - Helps corporations issue securities and structure corporate mergers/acquisitions

2.6 Regulation

The U.S. Financial System is one of the most highly regulated sectors of our economy for two reasons:

1. Increase information available to investors
   - This is to reduce the problems brought upon by Asymmetric Information
   - SEC established in 1934to prevent Fraud/Insider trading/Price manipulation
2. Soundness of the financial system
   - Asymmetric Information can lead to a widespread collapse (financial panic).

Because the potential outcome of financial panic can produce large losses and cause serious damage to the economy, the govt. has implemented six types of regulations:

1. Restrictions on Entry
   - Must receive a charter from state/federal govt.
   - Only upstanding citizens with impeccable credentials & large initial funds will be given a charter
2. Disclosure
   - Must abide by strict booking principles which are subject to inspection
3. Restrictions on Assets & Activities
   - Restrictions apply to reduce riskiness of investments (e.g. banks cannot hold common stock)
4. Limits on Competition
   - Politicians are convinced that higher competition promotes failures that harm the public
   - Impose limit on number of branches and where they may open them
5. Restrictions on Interest Rates
   - Another form of limits on competition. A restriction set on the max interest rate that can be paid on deposits.
6. Deposit Insurance
   - FDIC insures deposits up to $250K to prevent bank runs/panics

3 What is Money

Defining Money

Figure 2: Forms of money

(a) U.S. Dollar

(b) Cow

(c) Gold Bar

(d) Rai Stone

What is Money? - *Any common asset that someone is willing to accept for payment*

Figure 1 displays four potential forms that money could have. Figure 1a. is the typical form that we view money to take on but it doesn't always have to be this way. Money can take any physical form as long as it is widely accepted for payment by society.

Figure 1d. depicts a particularly interesting example of money. A Rai Stone is an ancient form of currency that was found in the south pacific islands. It was painstakingly carved from a single piece of limestone. Each piece measured 12 feet in diameter and weighed about 8 tons. Natives would canoe to neighboring island, carve the disk, and carry in back to the village. Interestingly enough, the stones were never actually moved, but just changed ownership. As bizarre and inefficient as it may be, these 8 tons chucks of limestone were used as a form of currency once upon a time.

Bartering Economy

A bartering economy is an economy not based on a form of money but solely on the of trading goods. This type of economy could work in a very small group such as a village but one problem arises rather quickly:

Double coincidence of wants

Incentive to Develop Common Exchange

Because of the problem that arises in a bartering economy, there is an incentive to declare a common item as a medium of exchange. Once people begin to accept this item for exchanges, people that normally didn't need the item would start to accept it due to its market value.

⇒ For Example: Governor of Tennessee was paid 1000 deerskins/year

Commodity Money - *Item that has additional value independent of use as money*

One a commodity money is introduced

1. *Trade becomes easier* 2. *No longer have to make everything needed* ⇒ *Allows for Specialization*

Functions of Money

- *Medium of Exchange*
  - Use my money to buy the stuff I want
  - "Middle Man" between buyers and sellers
- *Unit of Account*
  - All goods have single price $5
  - Barter: cow= 2 apples or 6 pigs
- *Store of Value*
  - Money allows value to be stored easily
  - Not only store of Value (e.g. Art, Land)
- *Standard of deferred payment*
  - Facilitates for borrowing and savings
  - Must be Reliable

3.1 Evolution of Payment Systems & Types of Money

Printed in 1928

Printed in 1990

1. Commodity Money

- *Value independent of use as money*
- e.g. Gold or Gold Dollar

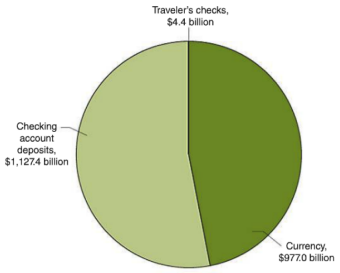
2. Fiat Money

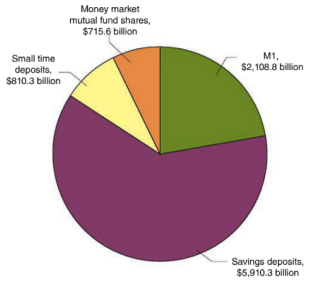
- No other value other than of use as money
- Legal tender, in other words the govt. requires it be accepted as payment for debts

3. Checks
   - Instructs your bank to transfer money
   - Eliminates the need to carry around large amounts of currency reducing transportation costs
   - Downside: Takes time to get checks from one place to another & processing checks can be costly
4. Electronic Payment
   - The development of the internet has made paying bills electronically very cheap & popular
5. E-Money
   - Substitute for checks and cash (e.g Debit cards/Venmo/Bitcoin)

3.2 Money Supply in the U.S.

There are two types of measurements used to calculate the Money Supply in the United States.





1. *M1 - Narrowest measure (1,935.5)*
   - *Currency (958.8)*
   - *Demand Deposits (573.1)*
     - Business checking accounts
   - *Other Checkable Deposits (399)*
     - all other checking deposits
   - *Travelers Checks (4.6)*

1. *M2 - Widest measure (9,002.6)*
   - *Everything in M1 (1935.5)*
   - *Small-denominate time deposits (848.3)*
     - CDs $<$ \$100,000
   - *Savings deposits & Money Market deposits (5,530.4)*
     - Savings accounts &
     - Money market mutual funds issued by banks
   - *Money market mutual fund shares (688.4)*
     - Retail accounts where households write checks

$$\frac{\$Currency}{Population} = \frac{\$958.8Billion}{320MillionPop.} \approx \$3,000/person$$