

I. MACROECONOMICS: AN INTRO TO THE BIG PARADE

A. Some Important Introductory Comments

1. Basic differences between macro and micro.

- Macroeconomics is the branch of economics that deals with the economy as a whole

micro - P & Q in one market

macro - P level & Q in all markets

- Macroeconomics focuses on issues most widely discussed in the media & political debates (i.e., inflation, unemployment, growth, trade, and national income or product).

2. Macro has 2 major issues of focus:

- Understanding economic growth in the long run & the factors behind the rise in living standards in market economies

- Understanding economic fluctuations (i.e., the ups & downs of the economy over time).

3. The goal of the macroeconomist is to explain the behavior of the macro economy in such a way as to facilitate policy formation.

4. John Maynard Keynes is the father of macroeconomics & the “Keynesian” school of economics.

- Renowned British economist who wrote the seminal book **The General Theory of Employment, Interest, & Money**.

- While recent economists have developed far more complex & realistic models, Keynes’s basic theories are what are used by the government, the popular press, and by the captains of industry to summarize “the big picture” of the economy.

- Keynes developed a theory of the causes of the Great Depression & how the worldwide crisis of the time could be cured.

Big question @ the time: There was 25-35% unemployment that seemed to persist. Classical economists had historically argued that the economy would naturally return to full employment.

His theory emphasized the short run benefits from changes in government spending & taxes to reduce unemployment

This contrasts with the classical (Adam Smith) & more recent approach, which focuses on the long run and asks what, if anything, can be done.

Goals

- (1) Explain how the nation's output (the level in nominal & real terms) is measured.
- (2) Explain what full employment means and how unemployment (cyclical, frictional, and structural) is defined and measured.
- (3) Explain how inflation is defined and measured.
- (4) Explain the two basic ways in which the national output is measured.

These two ways represent the two sides of the circular flow of the economy that we described in the first part of the course.

These two sides will also form the basis for the two major theories of macro economy.

B. The Circular Flow revisited

1. The most fundamental concepts in macro begin with the circular flow that describe production and income.

2. Factor Markets (the bottom):

Households supply inputs of production (L, K, N, & E) and they are paid wages for their work, interest, dividends, rents, and profits for supplying capital.

3. Product Markets (the top):

Households use their income to purchase goods and services, which are the source of payments by firms for their factors of production.

4. The production of goods & services in the economy are the flows of income to households (i.e., the top=the bottom).

C. Measuring the Output of the Economy: Production

1. Gross Domestic Product (GDP) is defined as the total **market value** of all **final** goods and services **produced** in the economy in a **given year**.

- the most common measure of the total output of the economy.

- note: domestic means that it does not include trade in the value.

2. What does the definition mean:

- market value refers to the quantity of goods multiplied by their respected prices ($P * Q$)

- final goods: goods sold to their final user (note: double counting must be avoided)

Car = f(steel, glass, plastic, etc.)

- given year: goods produced in prior year must not be included (no garage sales).

- GDP can be measure in **nominal** and **real** terms. Since we use prices times quantities of goods to measure the value of GDP, GDP can increase even if physical quantities of the goods remain the same.

- nominal GDP: measured in current prices. Thus, nominal GDP can change for 2 reasons:

More goods are produced

Prices have increased

- real GDP: measure that accounts for changes in the price level.

Only increases when more goods are produced.

Changes in real GDP are what economists mean by growth.

3. Four basic expenditure categories.

- one of the two basic approaches to measuring GDP is based on asking who purchases the final goods and services. There are four basic categories.

(i) Consumption expenditures: goods and services bought by households. (2/3rd of outlays)

(ii) Private Investment expenditures: goods and services bought by business. (15 percent on average, but quite volatile)

(iii) Government purchases: goods and services bought by federal, state, and local governments.

(iv) Net exports: purchases of domestically produced goods and services by foreigners less imports (i.e., purchases of foreign goods and services by domestic consumers).

4. Table below identifies who purchased the final output in 1999.

COMPONENT OF GPD	OUTPUT IN DOLLARS	PERCENT OF GDP
Consumer expenditure	\$6,148	68
Investment expenditure	\$1,427	14
Government expenditure	\$1,544	18
Net exports	-\$226	2
Total GDP	\$8,893	100

note: per capita GDP is \$29,231

5. Components of each output category (must know).

(i) Consumption expenditures comprise purchase of currently produced, domestic or foreign, goods and services and are broken down into:

Durable goods: goods that last for a long time (e.g., cars, tv's). Relatively high variability.

Non-durable goods: goods that last a short time (e.g., food).

Services: includes work done in which people play the prominent role (e.g., doctors, lawyers, & plumbers).

(ii) private investment expenditures. Includes

Spending on new plants and equipment.

Newly produced housing.

Increases in inventories in past year

Note: the difference between this use of investment and the everyday use of the term.

(iii) gross investment: is the total new investment made in a year. The true additions to capital stock of the economy are gross investments less depreciation (i.e., the deterioration of plants and equipment).

Net investment = gross investment - depreciation

(iv) government expenditures: include any goods the government purchases plus the wages and benefits of all government employees. It does not include all government spending.

Note: of the \$1,544 billion in gov expenditures in 1999, \$1,010 billion were state & local gov. expenditures (62-68%).

Government transfer programs are not included (i.e., social security, welfare, and interest on gov. debt). Of the \$1,806 billion of fed. gov. expenditures, only \$533 billion are included.

(v) Net exports: total exports minus total imports. Measures U.S. production with imports produced outside U.S. netted out.

In 1999, the US bought \$226 billion more goods than it sold abroad.

Trade deficit: imports > exports -true since mid 80s
Trade surplus: exports > imports
Trade balance: imports = exports

When imports > exports, we give up \$ to foreigners, which can be used to purchase US assets (stocks, bonds, and real estate). When dollars become abundant the “value” of dollars fall in relation to foreign currencies.

6. The second approach to measuring national output is to ask “who gets the income?” Three adjustments must be made to GDP in order to arrive at the nations income.

(i) Gross National Product(GNP): Add to GDP the net income earned by US firms and residents abroad & subtract income earned in the US by foreign firms.

(ii) Net National Product (NNP): subtract depreciation from GNP.

(iii) National Income (NI): Subtract indirect taxes (i.e., sales or excise taxes on products, because the part of sales revenue that goes to the gov. is not part of private sector income).

National Income in 1999

INCOME CATEGORY	VALUE IN \$ BILLIONS
Wages and benefits	\$5,166
Corporate profits	869
Proprietors income	598
Rental income	168
Net interest	400
Total national income	\$7,265

Note: Wages & benefits account for approximately 2/3rds of NI.

D. Some Problems with Income Measures

1. GDP & GNP are the best measures of the value of output, but they are not perfect.

2. Things that the income measures do not consider.

- transactions that do not take place in organized markets

 - Yard sales - services we provide for friends

- services performed in the home

 - Estimate of annual household services performed in the “average US household” \$30-50k

- the underground economy

 - IRS estimates that grey markets (tax avoiding schemes) are worth \$100 billion per year

- environmental impacts or depletion of natural resources.

E. GDP From Two Sides: A Summary of the Big Picture

1. We can ask “who buys the output that is produced?”

$$C+I+G+ \text{Net Exports} = \text{GDP}$$

Note: nearly 70% of GDP is consumer expenditures.

2. We can ask “who gets the income”

$$\text{Wages} + \text{Benefits} + \text{Interest} + \text{Profit} = \text{NI}$$

Note: nearly 75% of NI is paid in wages and benefits.

F. What is Unemployment and How is it Measured?

1. Some definitions:

The unemployed: those individuals who do not have a job but who are actively seeking work and cannot find one at current wages.

The labor force: includes people who have jobs and those who are actively seeking work (i.e., $LF = E + U$).

Discouraged workers: - people who quit seeking work because they become discouraged (excluded from the labor force),

$$\text{Unemployment rate: } UR = \frac{UNEMPLOYED}{LABOR FORCE}$$

2. Types of Unemployment

Cyclical unemployment: unemployment that results from fluctuations in real GDP.

Frictional unemployment: unemployment that occurs naturally due to the fact that it takes time to find an appropriate job or move between jobs (e.g., it takes time to search for a new job). This type of unemployment is a healthy by product of finding the right matches for workers and firms in a growing economy (e.g., you would not a brain surgeon to take a job in a McDonald's because it's the first job seen).

Structural unemployment: refers to a mismatch between jobs available and the skills of the workers seeking jobs (e.g., timber workers lose their jobs in Oregon and do not have the skills to work at Sony).

3. The Natural Rate of Unemployment

- When the economy is at full employment the unemployment rate is not zero.
- The natural rate of unemployment consists of frictional and structural unemployment: however, when the economy is at capacity there should be no cyclical employment.
- The natural rate of unemployment is:
 - 4-5.5% in US
 - 7-10% in Europe

- Two things to note:

(1) when the growth rate of real GDP slows down relative to its long run trend actual unemployment exceeds the natural rate (i.e., there is some cyclical unemployment)

(2) if economic growth is too rapid the economy will “overheat” and cyclical unemployment will be negative - this eventually leads to wages & prices increasing.

G. Inflation and the CPI

1. The price level, or inflation, is measured by the consumer price index, or CPI. The price index is a measure of the average prices of goods and services contained in GDP.

2. The price index has a 100 base year value (i.e., at the beginning of the period the price index has a value of 100).

3. If average prices of the “market basket” of goods changes by 10%, the index is 110.

Inflation is the % rate of increase in the price level.

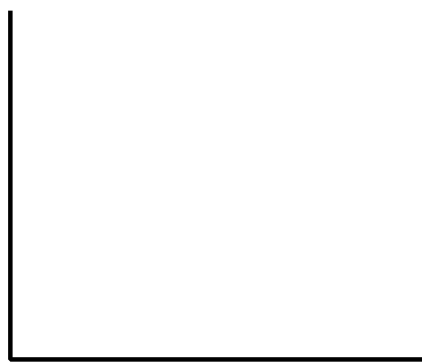
$$\text{CPI in year } K = \frac{\text{Cost of the market basket in year } k}{\text{Cost of the market basket in base year}} \times 100$$

Note: inflation refers not to the level of prices, whether they are high or low, but their percentage change from year to year (See historical pattern).

II. THE ECONOMY IN THE LONG RUN

A. Background

1. The classical economists believe the economy naturally moves towards full employment. Thus, their theory explains the economy at or near full employment.
2. Thus, “booms” and “busts” in the economy were thought to be temporary conditions. (Keynesians were the first to start thinking about business cycles).
3. This belief is based on the principle that “prices” will adjust to bring the labor market into full employment equilibrium.
4. Classical economics is based on the principle that prices adjust in a natural way to bring markets into equilibrium



5. Full employment means that the economy is operating at the “natural rate of unemployment”.
6. Supply side economics: $Y = f(L, K, N)$.

GOALS

1) Explain the classical theory of macro economy. The theory includes an explanation of:

- What determines full employment in the short run.
- What determines economic growth and how long-run adjustments take place.
- Long run adjustments include growth due to: (1) additions to capital and technical progress; (2) changes in population and the labor force.

Note: long-run adjustments to the supply of inputs is central.

2) Explain economic policy and the role of government in classical economic theory. Central concepts for classical economists include:

- Crowding out and crowding in.
- Optimal taxation.

B. The Classical Theory of the Economy

1. Starting point is the aggregate production function: defines the relationship between total inputs used throughout the economy and the corresponding level of production (i.e., GDP).

2. Some assumptions:

-Only two factors of production labor (L) & capital (K).

-Operate in short run. In the short run, K is fixed.

3. With fixed amount of capital, the relationship between labor and aggregate output can be uniquely defined by the short-run aggregate production function.

$$Y=f(L, \bar{K})$$

Y = total output or GDP

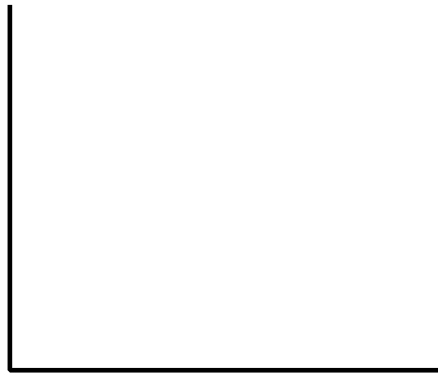
L = labor, or efforts of all workers

\bar{K} = fixed level of capital stock

4. Graphical relationship. Output depends on labor & the fixed amount of capital. With capital fixed, output increases with labor, but at a diminishing rate.



5. When the stock of capital increases, the entire production function shifts upwards. At any level of labor input, more output can be produced. Additions to capital increase the productivity of labor.



6. The production function provides the information necessary to obtain the aggregate demand for labor in the short run.

- Recall that firms are motivated to hire labor in a profit maximizing way and that the value of the marginal product of is the demand for labor.

$$W = MP_L * P = VMP_L$$

- In classical economics, the aggregate demand depends on the real wage.

$$MP_L = \frac{W}{P}$$

7. The aggregate demand for labor is then:



8. The aggregate supply of labor is based on the decisions of workers. Workers are motivated to supply labor to maximize their welfare (utility). An increase in the real wage has two effects:

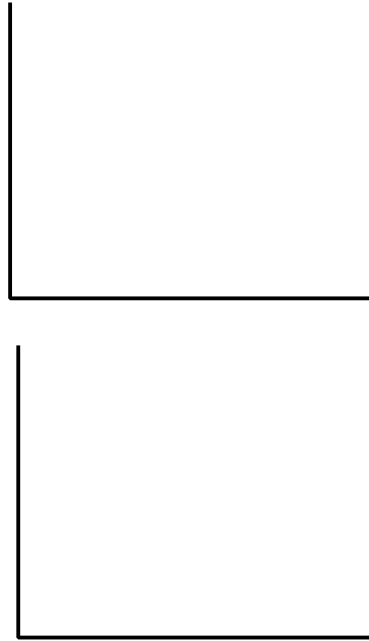
- substitution effect: a higher real wage causes workers to substitute towards leisure ($W \uparrow \rightarrow \text{leisure} \downarrow \rightarrow L \uparrow$).

- income effect: a higher real wage increases real income, thus workers can afford more leisure time ($W \uparrow \rightarrow \text{Income} \uparrow \rightarrow \text{leisure} \uparrow \rightarrow L \downarrow$)

Classical economists maintain and empirical evidence supports the fact that the sub > inc, which implies the labor supply has a positive slope.



10. Full employment equilibrium occurs at the point where the real wage brings the demand for labor and the supply of labor into equality



11. What if the real wage is too high?

- unemployment puts downward pressure on wages and lowers the real wage

- even if wages are rigid, these high wages will put upward pressure on prices in product markets, which will reduce real wages.



12. What if wages are too low?

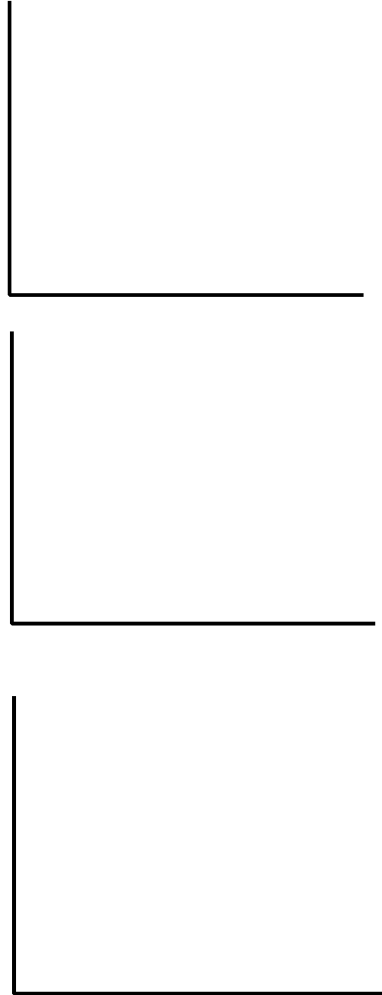
- Firms wage to hire more labor than is available at current wages, and they will be motivated to increase wages to get more labor. This increases real wages.
- Even if wages are rigid, with wages too low, the price of products will fall and this will increase the real wage.



Conclusion: the classical economist argued that this combined pressure on wages and price would restore full employment naturally and in a reasonable time period.

D. An Aside: So where does inflation come from?

P	Y
3	33.3
2	50
1	100
.50	200
.25	400



$$M * V = P * Y$$

$$50 * 2 = 100$$

in short run economy cannot produce more than the full employment level of output. Thus, if the money supply increased to 200, demand would increase and the price level would rise to \$2.

D. What is Economic Growth and What Causes it?

1. Growth = $\frac{\Delta GDP}{GDP}$ in real time (note: percentage change)

2. Three major factors that lead to growth:

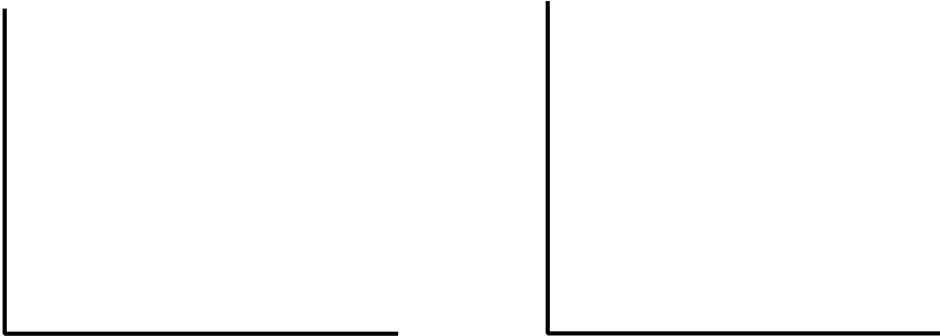
- ΔK
- Tech Δ
- Population

note: Growth implies increases in real income.

3. Prime mover #1: Capital creation.

- expected profits are the primary motivation for capital deepening.
- capital deepening refers to an increase in the capital stock relative to labor.
- when labor has more capital to work with, labor productivity increases.

The classical economists assign the central role to entrepreneurs in finding market niches where this capital will earn profits.



Graphical analysis of capital deepening? The aggregate demand for labor shifts to the right, and thus wages and employment rise. Product prices fall because of increased productivity (or reduced costs), which increases demand for output.

4. Prime mover #2: technological progress.

- This is defined as the ability to produce more output with the same inputs.
- The driving force is the birth of new ideas.
- Economists have established that this depends on R&D in basic science, market scale, education, and monopoly profits.

Technological progress increases the productivity to all inputs and thus increase the real returns to all factors of production.

5. How does the market handle population growth?

- Increases in the population increase the supply of labor (with a lag). The market adjustment will result (other things equal) in increased employment and lower wages.



- The long term effect on living standards depends on the relative effects of population growth, capital deepening, and technological progress (remember Malthus).

E. The Classical Economists Approach to Government

1. They recognize the existence of public goods and spillovers, but prefer market solutions where possible.

Pollution: the classical economist believes in the creation of private property rights as opposed to gov. intervention.

Crime: Prevention through appropriate penalties and apprehension probabilities.

Education: vouchers and local government provision where “voting with your feet” is possible.

Poverty: private charity and income supports with incentives for work and the elimination of government welfare programs.

2. They focus on the disincentive effects of taxation, which would be required with government provision:

i) The Laffer curve: calls attention to the adverse effects on incentives and government revenue.



ii. They stress that government expenditures crowd out private consumption and investment.

If the government is at full employment, more government spending must replace C & I

$$Y = C + I + G + (E-M)$$

iii. Crowding in: some investments in infrastructure (e.g.,

bridges, roads, etc.) may improve firm efficiency and may cause firms to expand. Note: even in these situations the most ardent classical economists contend that government is likely to provide these public goods inefficiently.

F. Classical Macro: A Summary of Major Conclusions

1. If left alone, the market will gravitate to full employment equilibrium.
2. Little or nothing can be done to improve on the market outcome because it takes into consideration the benefits & costs of every alternative.
3. Collective investments that arise because of public goods or spillovers should be taken on by the government if and only if
 - Some form of market provision is not feasible.
 - Returns are higher than the private activity that will be crowded out.

III. KEYNESIAN MACRO OR DEMAND-SIDE ECONOMICS

A. Background

1. Keynes developed his theory during the Great Depression. The classical argument that markets would “naturally” correct this world crisis seemed improbable.
2. Keynes thought that the widely varied shocks in the world

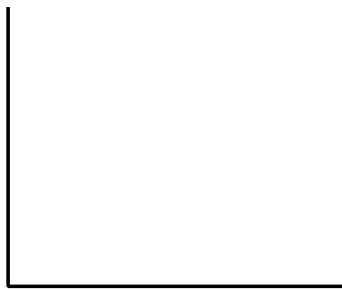
economy put too much pressure on price adjustments in the short run. Just a few examples:

- Bad weather and natural disasters caused major disruptions in world output.
- Wars that caused major destruction of production facilities.
- Major shifts in technology occur on an ongoing basis.
- Oil and energy shocks occur from time to time.

3. Two major problems may exist with respect to prices:

- They may not contain adequate information: In short, they may not internalize future market conditions and real vs. nominal adjustments may be confused.
- Prices may not be sufficiently flexible. Prices may be “sticky”: Unions or firm wage and price agreements may slow price-wage adjustments.

In Keynes' view it made sense to think of prices as fixed in the short run.



4. Keynes also thought that business cycles were built into the structure of capitalist economies, but this could be corrected to some extent by appropriate policies.



5. His approach focused on the demand side of goods and services, which he argued determined output and employment in the short run.

Demand-Side Economics (C, I, G, E-M)

6. He agreed with the classical economist that the market would gravitate toward full employment in the long run but he lamented that "...in the long run we are all dead".

GOALS

- 1) To explain the determinants of aggregate demand and what causes it to shift.
- 2) To explain the classical and Keynesian aggregate supply curve.

B. The Basic Keynesian Demand Curve

1. The aggregate demand curve plots real GDP as a function of the price level.



2. Aggregate demand is downward sloping because:

- The law of demand.
- The wealth effect: when prices fall, the real value of assets increase, which increases spending.

100 units of K - if P falls it is like K is worth more.

- The interest rate effect: when prices fall, interest rates fall, which increases investment spending

$$\text{real interest} = \frac{i}{P}$$

- The international trade effect (lower price makes domestic products relatively competitive).

3. What causes the aggregate demand to shift?

-At any price level, an increase in total demand means that aggregate demand shifts to the right and a decrease in demand means a shift to the left.

- The curve shifts, for example, because of changes in the money supply or changes in government spending or taxes



C. The Aggregate Supply Curve: Classical & Keynesian

1. Definition recalled: depicts the relationship between GDP supplied and the real price level.

2. Classical aggregate supply

- At full employment, the aggregate supply curve is assumed to be vertical.



In other words, any change in demand will increase prices leaving output unchanged.

3. The Keynesian aggregate supply curve is a horizontal line in the short run.

- This horizontal supply curve exists because firms are assumed to supply all output that is demanded at current prices.

- Formal and informal contracts commit producers to supply all that is demanded at the going price, and workers have employment contracts.

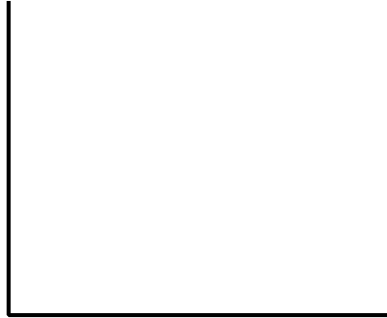


Note: With the Keynesian supply curve changes in demand change output (employment), but not prices.

4. The Bush Tax Cut



5. The “War on Terror”



D. What Happens in the Long Run?

1. In the long run, firms and workers can renegotiate contracts. Thus, prices and wages can adjust upwards.
2. Flexible prices means that external shocks will simply shift the aggregate supply upwards or downwards, which will offset short term effects of demand increases.



Note: a more realistic (and difficult) model is developed in the text (Keynesian Cross). Leave this for Econ 202.

IV. MONEY, THE FEDERAL RESERVE AND MONETARY POLICY

GOALS

- 1) Define money and identify the components of the money supply.
- 2) Explain how banks “create” money.
- 3) Explain the demand and supply of money.
- 4) Provide a brief overview of monetary policy and how the Federal Reserve controls the money supply in pursuit of full employment without inflation.
- 5) Consider some important international issues with regard to monetary policy.

A. Money, Its Definition and Components

1. Money is anything that is regularly used in economic transactions or exchange. We usually accept currency or checks because we believe other will accept them when we want to make payments. Desirable properties include:

(i) A medium exchange

saves us from the “double coincidence of wants”

(ii) A unit of account (technically anything can be money - but not all cattle are the same!)

(iii) A store of value: set it aside and it will keep its value.

(iv) standard for deferred payments.

2. The components of the money supply. There are a large number of definitions of the money supply. The general distinction between these definitions is their relative ease of use. Some of the major definitions are as follows:

(i) M1: money regularly used in transactions

in 1999, M1 was \$1,097 billion. Currency (\$487 billion), demand deposits (\$361 billion), other demand deposits subject to check (\$241 billion) and travelers checks (\$8 billion). This is \$1873 per person in the US.

(ii) M2, a broader definition of money that includes assets easily turned into M1.

Money market mutual funds and savings accounts. In 1999, M2 was 4.5 trillion.

Note: two thirds of the money supply in the US is in a demand deposit subject to a check.

B. The Role of Banks and Financial Intermediaries in “Creating Money”

1. The major function of banks and financial institutions is to bring savers and investors together. Banks, by their ability to make loans based on their reserves have the power to create demand deposits, therefore, money. Some basic definitions are necessary to understand this ability to create money.

2. Some basic definitions:

- Liabilities: the source of bank funds or deposits (it is who the bank owes).

- Assets: the use of the bank funds or loans (what people owe to the bank)

- Banks assets equal its liabilities plus its net worth

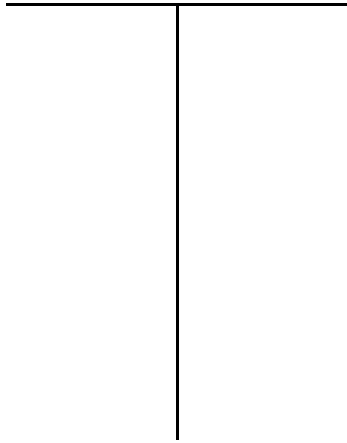
$$A = L + NW$$

$$NW = A - L$$

- Bank reserves are the assets that are not loaned out.

- Reserve requirements - banks are required by law to keep a fraction of its deposits on reserve (either in case or deposits)

- Reserve ratio - ratio of reserves to deposits (RR)



3. The “money multiplier” or the expansion of the money supply when reserves change by a \$1.

$$MM = 1/RR$$

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The required R.R. is ten percent, but the measured bank multiplier is approximately 2.5. Why?

Ans: Excess reserves/other leakages

In general it is important to remember that the R.R. and the lending policy of banks determine the supply of money.

C. The Determinants of the Demand for Money

1. Money is part of your wealth. If you hold any of your wealth in an idle form, you sacrifice the interest earnings. So why hold money in such an idle form? There are basically three motives for doing so (according to Keynes).

(i) The transactions motive (at high interest rates you hold just enough to purchase what you need; at low interest rates you would hold it all a cash).

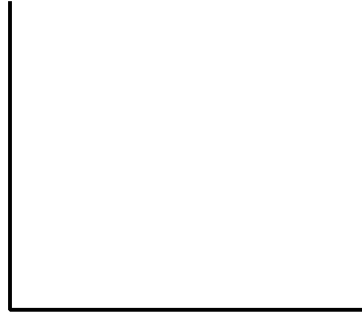
(ii) The liquidity motive (precautionary motive).

(iii) The speculative motive.

2. The demand for money is determined by the combined transaction, precautionary, and speculative demands for money by households. It is important to understand why the above motives result in a downward sloping demand for money.



3. The supply and demand for money determines the interest rate.



4. It is also important to understand the relation between the interest rate and the price of bonds. In short, when interest rates go up (down) bond prices go down (up). In other words, the price of bonds and the interest rate are inversely related.

Face Value	i	Cost 1-year bond
100	10	90
100	5	95
100	2	98

in other words as $i \uparrow \rightarrow P \downarrow$

D. A Brief Review of the Federal Reserve

1. What is the Fed?

- It is a bank for bankers create by an act of Congress in 1913 after a series of financial panics.

2. Three parts

(i) Federal Reserve Banks - 12 districts in the US each with a bank. They are the liaison between Fed and commercial banks. (Closest one is San Fran).

(ii) Board of Governors - Located in Washington D.C., seven members appointed by president. Chair is the chief spokesperson for monetary policy.

Alan Greenspan

(iii) Federal Open Market Committee - Composed of the Board of Governors and 5 Fed. Bank Presidents; these persons are in charge of monetary policy.

3. Monetary policy: Actions taken by the Federal Reserve to Influence the level of GDP, Employment, and Inflation. The basic policy tools include:

(i) Open market operations

recession → buy bonds (put money in) → $P \uparrow$ & $I \downarrow$

inflation → sell bonds (take money out) → $P \downarrow$ & $I \uparrow$

(ii) Setting the discount rate

rate member banks can borrow from Fed.

(iii) Setting the reserve requirement.

major - would be used only if there was major economic crisis.

4. Basic idea of monetary policy: Suppose there is a recession, need to increase income.

$\uparrow M \rightarrow i \downarrow \rightarrow I \uparrow \rightarrow \text{Aggregate Demand} \uparrow \rightarrow Y (C+I+G) \uparrow$