

Economics 212
Principles of Macroeconomics
Study Guide

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INTRODUCTION

I What is Macroeconomics

A Definition

Definition 1 *Macroeconomics is the study of how the economy as a whole grows and changes over time.*

B Concerns of Macroeconomics

1. Measuring how well the economy is performing.
2. Seeking to understand how the economy works.
3. Improving the performance of the economy.

C Why study macroeconomics?

1. Improve wealth and welfare.
 - Unemployment.
 - Less developed countries.
2. Help individuals make economic decisions.
 - When to buy a house.
 - When to start a new business.

II The modeling approach to economics: microfoundations

A Economic Principles

Macroeconomics models individual behavior and then aggregates across individuals.

B Macroeconomic Markets

1. OUTPUT MARKET. Goods and services.
2. INPUT MARKETS. Raw Materials.
 - LABOR: human effort.

- CAPITAL: physical equipment.

3. MONEY/FOREIGN EXCHANGE MARKETS.

- MONEY MARKET. Money, checks, and other methods of payment.
- FOREIGN EXCHANGE MARKET. Use of foreign currency to buy foreign-made goods.

III Some Questions we will answer

1. Economic Growth.
2. Unemployment.
3. Inflation.

Measuring the Economy's Health

I Output

Definition 2 *Nominal Gross Domestic Product (NGDP). Current market value of all finished goods and services produced domestically in a specified time.*

- what? finished goods and services.
- where? Domestic production.
- when? A specified period.
- Value equals price.

A Calculating NGDP: Value Added Approach

Definition 3 *NGDP equals Value added which equals revenue less cost of goods sold*

$$\text{NGDP} = \text{revenue} - \text{cost of goods sold.} \quad (1)$$

NGDP equals production.

B Income Approach

Definition 4 *NGDP equals Total income which equals wages plus profits*

$$\text{NGDP} = \text{wages} + \text{profits.} \quad (2)$$

$$\text{profits} = \text{revenues} - \text{wages} - \text{cost of goods.} \quad (3)$$

NGDP equals income.

1. Labor income: wages, salaries, and fringe benefits.
2. Capital income: profits, rental payments, interest payments.
3. Depreciation. DEPRECIATION loss of value of investment goods. Business do not count depreciation as part of profits, so add back in as part of capital income.

4. Indirect business taxes: sales taxes, import taxes, and license fees. Taxes are part of the value of a good.
5. Income of foreigners that produce goods in the US. Part of domestic income.
6. Subtract US income earned abroad. Not part of domestic income.

C The Spending Approach

NGDP equals spending.

1. CONSUMPTION (C). Purchases of final goods and services by individuals, except new housing.
2. INVESTMENT SPENDING (I). Purchases of final goods and services by firms: machines and equipment, inventories, and new housing.
3. GOVERNMENT PURCHASES (G). Purchases at all levels of government (military, roads, police). Not TRANSFER PAYMENTS: monetary payments such as social security, welfare, scholarships, NSF funding, NEA funding, etc.
4. NET EXPORTS (X-M). EXPORTS (X): purchases by other countries of domestically produced goods and services. IMPORTS (M): purchases of foreign produced goods and services by our country. Imports of foreign produced goods are counted as consumption and therefore must be subtracted out here.

$$NGDP = \text{total expenditures} = C + I + G + X - M \quad (4)$$

$$NGDP = \text{Income} = \text{value added} = \text{total value of finished goods} = \text{expenditures.} \quad (5)$$

D Direct Calculation

For all n finished goods in the economy:

$$NGDP = P_{1,t}Q_{1,t} + P_{2,t}Q_{2,t} + \dots + P_{n,t}Q_{n,t} \quad (6)$$

E Real GDP

Definition 5 *REAL GDP (GDP) is the total value of goods and services in constant dollars.*

Increases in prices do not increase GDP.

$$RGDP = P_{1,b}Q_{1,t} + P_{2,b}Q_{2,t} + \dots + P_{n,b}Q_{n,t} \quad (7)$$

Here b is a base year.

$$NGDP = \text{Income} = \text{Expenditures} = \text{value added} \quad (8)$$

$$GDP = \text{real income} = \text{real expenditures} = \text{real value added} \quad (9)$$

F GDP Growth and Cycle

$$\text{GDP Growth Rate} = \frac{GDP_t - GDP_{t-1}}{GDP_{t-1}} \quad (10)$$

Definition 6 *A BOOM is a period of above average GDP growth*

Definition 7 *A RECESSION is two consecutive quarters of negative GDP growth.*

G GDP and Welfare

$$\text{GDP per capita} = \frac{GDP}{\text{population}} \quad (11)$$

GDP per person is our measure of welfare.

1. A general measure. Some industries decline while others increase.
2. GDP does not account for distribution of income.
3. Leisure is not an element of the GDP.
4. Does not account for non traded goods: housework, raising children, etc.
5. Some goods are not in the GDP, but spending on these goods are:

- (a) Environmental goods such as clean air and use of water resources such as pollution in a river.
- (b) Good health (life expectancy, child mortality).
- (c) Low crime.

Although some goods are not in the GDP spending on them are (spending on health care improves health, spending on police reduces crime, etc.). Thus measures of health such as life expectancy tend to be better in countries with a high GDP.

II PRICES

Definition 8 A *PRICE INDEX* is a ratio of the expenditure on a basket of goods and services in some given period to the expenditure in some base period.

If the price index equals 200, the basket is twice as expensive as in the base year.

A Price Indices

Price indices differ according to what is in the basket.

- GDP DEFLATOR. Basket is all goods in the GDP in the current year.

$$\text{GDP deflator} = \frac{P_{1,t}Q_{1,t} + P_{2,t}Q_{2,t} + \dots + P_{n,t}Q_{n,t}}{P_{1,b}Q_{1,t} + P_{2,b}Q_{2,t} + \dots + P_{n,b}Q_{n,t}} \times 100 \quad (12)$$

- CONSUMER PRICE INDEX (CPI). Basket: goods purchased by a “typical urban family” in the base year.

$$\text{CPI} = \frac{P_{1,t}Q_{1,b} + P_{2,t}Q_{2,b} + \dots + P_{n,t}Q_{n,b}}{P_{1,b}Q_{1,b} + P_{2,b}Q_{2,b} + \dots + P_{n,b}Q_{n,b}} \times 100 \quad (13)$$

- INFLATION RATE: Percent change in price index from the previous period.

$$\text{CPI Inflation} = \frac{CPI_t - CPI_{t-1}}{CPI_{t-1}} \times 100\% \quad (14)$$

Use the same basket in the numerator and the denominator. New prices are in the numerator and old prices are in the denominator.

B Comparing Value Across Time

When comparing dollars across time, we must adjust dollars so that they buy the same amount of goods, since we really care only about goods.

$$\text{dollar value in year 2005} = \text{dollar value in year } t \cdot \frac{\text{CPI in year 2005}}{\text{CPI in year } t} \quad (15)$$

C Notes

- Use CPI for household or individual problems. Convert wage increase to real wage increase.
- Use the GDP deflator to convert aggregate statistics from nominal to real dollars. Convert NGDP to GDP using the GDP deflator.
- CPI overstates inflation because
 1. Fails to take into account improvements in technology.
 2. The CPI does not allow for substitution to cheaper goods.
- The CPI heavily weights goods such as food and energy and is more volatile.

D REAL GDP + price indices

$$RGDP = \frac{NGDP}{\frac{\text{GDP deflator}}{100}} \quad (16)$$

III Input Market number 1: measuring labor activity

A Who is working?

Definition 9 *WORKING AGE POPULATION: All non-institutionalized persons over 16. (ie. not in jail, in a hospital, or not able to work).*

Definition 10 *LABOR FORCE: All those working or looking for a job.*

Not working or looking is designated as NOT PARTICIPATING. You are not participating if you are:

- a student, unpaid homemaker, or retired.
- not willing to work because the wage is too low.

- an unpaid volunteer.
- have a job which starts in more than 30 days and are not looking for something which starts sooner.

Within the labor force, you are either employed or unemployed.

Definition 11 *EMPLOYED: Working and being paid.*

- Paid volunteers are employed.
- Armed forces are employed as of 1983.
- Part time work counts.

Definition 12 *UNEMPLOYED: Looking and willing to work, but not working.*

If you have a job which starts in less than 30 days, you are unemployed. Everyone in the population is either young and institutional, not participating, employed, or unemployed.

$$\text{PARTICIPATION RATE} = \frac{\text{LABOR FORCE}}{\text{WORKING-AGE POPULATION}} \cdot 100\% \quad (17)$$

$$\text{UNEMPLOYMENT RATE} = \frac{\text{UNEMPLOYED}}{\text{LABOR FORCE}} \cdot 100\% \quad (18)$$

B Labor market statistics

Definition 13 *TOTAL HOURS WORKED (N): all hours worked by all individuals in the labor force.*

Definition 14 *REAL WAGE: $\frac{W}{P}$ Total earnings of individuals and proprietorships not including fringe benefits divided by the CPI.*

$$\text{LABOR PRODUCTIVITY} = \frac{GDP}{N} \quad (19)$$

C The Labor Market

A labor market with no price floor predicts zero unemployment.

D Why is there unemployment?

1 Job Rationing: Theory

A price floor above the market wage can cause unemployment. Causes of price floors:

1. Minimum wage laws.
2. Insider laws. Laws preventing or restricting firing prevents firms from hiring unemployed at a lower wage.
3. Efficiency Wages. Extra pay above market pay to induce harder work.

2 Job Rationing: Business Cycle Effects

Definition 15 *The natural rate of unemployment is the long run average rate of unemployment, when the economy is neither in a boom nor recession.*

Definition 16 *Cyclical unemployment is the increase in unemployment due to recessions.*

The model predicts that unemployment falls in a boom and rises in a recession. Suppose the economy is doing well, so that firms demand more workers (either to sell more goods, or because workers are more productive). Then more firms have jobs which earn enough profits to justify paying the wage floor. Many unemployed workers are willing to work for the wage floor. As firms hire these workers, unemployment falls.

3 Evidence for effects of minimum wages and other policies

Policies that affect the natural rate of unemployment.

1. Minimum wage laws.
2. Taxes on wages, paid by both households and firms (the employee must make enough profits for the firm to pay both the tax and the minimum wage, or the firm will not hire).
3. Unemployment benefits.
4. Insider laws.
5. Job Training.

The US and Australia have lower natural rates than most of Europe, including Spain and France. What explains this difference?

1. The minimum wage? No, very low in Spain for example.
2. The tax rate on wages? Yes. France and Spain have the highest tax rates on wages.
3. Unemployment benefits? Somewhat. These are much greater for Spain and Australia than the US.
4. Insider laws? Yes. Spain has the worst insider laws.

The natural rate has fallen in the US over the last 30 years. Why?

1. The real minimum wage? Somewhat. The real minimum wage has fallen, since prices have risen by more than the minimum wage.
2. Insider laws? Yes. The influence of unions has declined, and thus insider laws have relaxed.
3. Real unemployment benefits? Somewhat. Benefits have fallen a little.
4. Tax rates on wages? Yes. These have fallen.

Overall, tax rates and insider laws have the biggest effect.

IV Input Market number 2: Capital Market

A Investment and Capital

Net investment spending.

$$\text{net investment Spending} = \text{gross investment Spending (I)} - \text{depreciation} \quad (20)$$

Definition 17 *The CAPITAL STOCK is the total of all net investments for all years.*

$$\text{Capital next year} = \text{net investment spending} + \text{existing capital} \quad (21)$$

B Savings

1 National Savings

Definition 18 *NATIONAL SAVINGS is that part of income which is not consumed by either consumers or government.*

$$S = Y - C - G \tag{22}$$

$$S = I + X - M \tag{23}$$

Foreigners can invest in the US, thus adding to our savings, or the reverse. Savings equals investment here and net investment abroad.

2 Public and Private Savings

We can divide Savings into public savings $T - G$ (government income less government consumption) where T is taxes and private savings $Y - C - T$ since:

$$S = (Y - C - T) + (T - G) \tag{24}$$

If the Government is running a deficit $G > T$, then the deficit reduces savings. Similarly, when I pay back school loans, that is savings.

C The market for capital: Loanable Funds Market

1 Quantity of Loanable Funds

The total pool of loanable funds is equal to the national savings. This is the supply of loans. The demand for loans is therefore investment spending plus net exports.

2 The market for loans

Increasing the deficit by cutting taxes replaces public savings with private savings. Overall savings and interest rates do not change. Increasing government spending reduces public savings without changing private savings. In this case national savings fall and interest rates rise.