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УЧРЕЖДЕНИЕ ОБРАЗОВАНИЯ
«БРЕСТСКИЙ ГОСУДАРСТВЕННЫЙ ТЕХНИЧЕСКИЙ УНИВЕРСИТЕТ»
КАФЕДРА ЭКОНОМИЧЕСКОЙ ТЕОРИИ И ЛОГИСТИКИ

МЕТОДИЧЕСКИЕ УКАЗАНИЯ

по дисциплине «МАКРОЭКОНОМИКА»

НА АНГЛИЙСКОМ ЯЗЫКЕ

для студентов экономических специальностей

УДК 331

Методические указания предназначены для студентов второго курса экономических специальностей учреждения образования «Брестский государственный технический университет» с целью оказания помощи в изучении курса «Макроэкономика» на английском языке.

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ПРЕДИСЛОВИЕ

Методические указания предназначены для студентов экономических специальностей дневной и заочной форм обучения Учреждения образования «Брестский государственный технический университет». Целью методических указаний является оказание помощи студентам в процессе самостоятельной работы над изучением дисциплины на английском языке.

Курс «Макроэкономика» изучается в соответствии с учебными планами и утвержденной программой как одна из базовых дисциплин экономического блока. Учебным планом предусматриваются различные виды учебной работы, включающие лекции, семинарские занятия, индивидуальные и текущие консультации.

В методических указаниях разработаны практические задания по каждой теме курса. Задания включают тесты, задачи и упражнения и составлены с учетом современных подходов в преподавании и изучении экономических дисциплин.

Методические указания ориентируют студентов на глубокое изучение макроэкономики, на выработку навыков самостоятельного анализа макроэкономических процессов.

I. Basic Economic Concepts

Economic Goals

1. Economic growth – produce more and better goods and services.
2. Full employment – suitable jobs for all citizens who are willing and able to work.
3. Economic efficiency – achieve the maximum production using available resources.
4. Price-level stability – avoid large fluctuations in the price level (inflation + deflation).
5. Economic freedom – businesses, workers, consumers have a high degree of freedom in economic activities.
6. Equitable distribution of income – try to minimize gap between rich and poor.
7. Economic security – provide for those who are not able to earn sufficient income.
8. Balance of trade – try to seek a trade balance with the rest of the world.

Basic Economic Problem

1. Society's material wants, that is, the material wants of its citizens and institutions, are virtually unlimited and insatiable.
2. Economic resources—the means of producing goods and services—are limited or scarce.

Types of resources

Land – all natural resources usable in the production process

Capital – all manufactured aids to production (tools, machinery, equipment, and factory, storage, transportation, and distribution facilities used in producing goods and services)

Labor – physical and mental talents of individuals available and usable in producing goods and services

Entrepreneurial ability – the entrepreneur 1) takes the initiative in combining the other resources to produce a good or service, 2) makes basic business-policy decisions, 3) is an innovator, and 4) is a risk bearer.

Factors of production

Several objectives must be satisfied to reach full production:

- 1) Full employment – use all available resources
- 2) Full production – use resources efficiently (productive efficiency – production in least costly way, allocative efficiency – production of goods and services most wanted by society)

Production Possibilities

The production possibilities curve represents the combinations of maximum output.

Curve that can be reached in the economy. It is a frontier because it shows the limit of output. Anything under the curve is attainable, but involves inefficient use of resources. Anything outside the curve is unattainable with current resources.

Usually, the curve is some type of consumer goods versus some type of capital goods.

Each point on the curve represents a maximum output of the two goods. Different points on the curve mean different production combinations of the two goods.

The curve bows outwards because of the Law of Increasing Opportunity Cost, which states that the amount of a good which has to be sacrificed for each additional unit of another good is more than was sacrificed for the previous unit. The rationale for this law is that some economic resources are not completely adaptable to alternative uses, so the resources will yield less of one product.

Shifts in this curve can be caused by increases in resource supplies or advances in technology. Also, if an economy favors “future goods” (technology, etc), the curve will shift faster because of more economic growth.

Determinants for Production

One must compare marginal benefits and marginal costs to determine the best or optimal output mix on the Production Possibilities Curve.

II. Basic Economic Measurements

Gross Domestic Product (Expenditures Approach)

Expenditures approach: $GDP = C + Ig + G + Xn$

C = personal consumption expenditures (durable consumer goods, nondurable consumer goods, consumer expenditures for services)

Ig = gross private domestic investment (all final purchases of capital by businesses, all construction, changes in inventories)

G = government purchases (government spending on products and resources)

Xn = net exports (exports – imports)

Some types of transactions do not involve purchasing of a final good or service, so they should not be counted in GDP. These include public transfer payments (social security, welfare, etc), private transfer payments (monetary gifts, etc), security transactions (stocks and bonds), and secondhand sales (they don't reflect current production).

Gross Domestic Product (Income Approach)

GDP = Compensation of employees + Rents + Interest + Proprietors' income + Corporate profits (Corporate income taxes + dividends + undistributed corporate profits) + indirect business taxes + depreciation (consumption of fixed capital) + net foreign factor income

Difference between approaches

The expenditures approach tells us GDP by telling us how much the final user pays for each thing, giving us the value of the final product. The income approach adds all the wage, rent, interest, and profit incomes created in producing the product. They both add up to the same amount because money spent on a product is received as income by those who helped to make it.

GDP growth

The GDP growth rate is calculated with the formula

$$\text{Growth Rate} = (\text{GDP}_{\text{new}} - \text{GDP}_{\text{old}}) / \text{GDP}_{\text{old}} \times 100$$

If the growth rate is between 2-4%, it is considered “acceptable”.

Nominal vs. Real GDP

Nominal GDP is sometimes inaccurate because if there is a lot of inflation, the actual GDP growth isn't as high as the figures seem to say. Therefore, we have a measure of GDP that is adjusted for inflation: real GDP. This is calculated by the formula

$$\text{Real GDP} = \text{Nominal GDP} / \text{Price index (in hundredths)}$$

Multiple counting/Value added

If we were to count the prices of intermediate goods instead of final goods in the expenditures approach, since the value of final goods already includes the value of intermediate goods, it would be counting the same thing multiple times, making GDP seem higher than it really is.

To avoid multiple counting, accountants calculate only the value added by each firm in each stage of the product, instead of just how much each firm sells its product to the next firm.

NDP

GDP includes the money spent for replacing capital goods used by the year's production, so it somewhat exaggerates the value of the output available. Net domestic product (NDP) makes allowance for this money spent by subtracting depreciation (consumption of fixed capital) from GDP.

For NDP to grow year to year, the stock of capital must increase.

NI

National Income includes all income earned by US-owned resources, whether located at home or abroad. To calculate NI, we must subtract net foreign factor income earned in the United States (since it isn't US-owned resources) and the indirect business taxes (since government isn't an economic resource and indirect taxes aren't a payment to resources).

PI

Personal Income includes all income received, whether earned or unearned. This is NI – social security contributions – corporate income taxes – undistributed corporate profits + transfer payments.

DI

Disposable income is the amount of money households can spend. It is PI minus personal taxes.

Real vs. Nominal values

A Nominal value is an unadjusted value. A Real value is a nominal value adjusted for inflation.

$$\text{Real Value} = (\text{Nominal Value}) / (\text{Price index (in decimal form)})$$

Therefore, we can't just look at nominal values when trying to determine the status of the economy. Since lots of inflation can lead to very high nominal values, we can get a false impression that the economy is doing well when the real value is perhaps even decreasing.

Inflation

CPI

Consumer price index is a measure of inflation. It is calculated by the formula

$$\text{CPI} = (\text{price in specific year}) / \text{price in base year/period} \times 100$$

Inflation

This is the increasing general level of prices from year to year.

The rate of inflation is calculated by the formula

$$\text{Inflation Rate} = (\text{CPI}_{\text{new}} - \text{CPI}_{\text{old}}) / \text{CPI}_{\text{old}} \times 100$$

If the rate of inflation is less than 3 percent (and greater than 0 percent, of course), it is considered "acceptable".

Types of Inflation

Demand-pull inflation: more spending than the economy's capacity to produce. The excess demand increases the prices of the limited real output, causing prices to rise. Cost-Push (Supply-side) inflation: Per-unit production costs (total input cost ÷ units of output) rise, reducing the amount of companies willing to sell products at the current price level. Then, supply decreases, causing the price level to increase.

Wage-price spiral

As price level rises, labor will demand and get higher nominal wages. Businesses will agree, hoping to get back the money by increasing prices. Then, as prices increase even more, labor will find that it has a reason to demand even more wage increases, but that causes more prices increases, and so on.

Rule of 70

If we divide 70 by the annual rate of inflation, this quotient is the number of years it takes for inflation to double the price level.

Fighting inflation

We can fight inflation by trying to reduce demand or by trying to prevent a wage-price spiral from getting out of hand. We can use either fiscal or monetary policy (means of doing so is explained later). Fiscal action will result in a budget surplus.

Inflationary expectations

The effects of unexpected inflation are:

It hurts people with fixed nominal incomes, since the money they earn isn't worth as much anymore. It hurts people who save in fixed-value accounts. It benefits debtors (borrowers) while hurting creditors (lenders).

The effects of inflation can be lessened if people expect it (anticipated inflation), since then they can get a chance to prepare for the damages that the inflation may cause.

For example, a person who has a fixed nominal income can try to adjust it if they know that its value is going to decrease. Many unions have labor contracts with cost-of-living adjustment (COLA) clauses, in which workers' wages increase if there is inflation.

Unemployment

Types

Frictional – includes workers who are searching for jobs or waiting to take jobs in the near future. This unemployment is inevitable, since many workers switch to better jobs.

Structural – changes over time in consumer demand and technology change the “structure” of total demand for labor. Some skills will not be needed as much or become obsolete, and new skills will appear. This is a mismatch between job seekers' skills and the skills needed for the job. This is also inevitable because the demand for labor will always change over time as new technologies arise.

Cyclical – this type of unemployment is caused by recession. People who are laid off because of decreased overall spending in the economy.

Full employment

This is NOT zero unemployment, as frictional and structural unemployment are regarded as unavoidable in an economy. Therefore, full employment means no cyclical unemployment, and the full-employment rate is equal to the frictional plus structural rates. It is also called the natural rate of unemployment.

Solutions

In order to decrease cyclical unemployment, we must try to increase overall spending in the economy so businesses find their inventories decreasing and so hire more people. We do this by increasing aggregate demand with fiscal or monetary policy.

Calculation

Unemployment means unemployment in the labor force, not the whole population. The labor force is total population – under 16 and/or institutionalized – people not in the labor force. Then, the unemployment rate is

$(\text{Unemployed people in the labor force})/(\text{Total number of people in the labor force}) \times 100$

Criticism of unemployment rate

The unemployment rate has been subject to some criticism, however. First of all, part-time workers are counted as fully employed; however, some part-time workers are people who can't get a full-time job because of recession. This tends to underestimate the unemployment rate.

Also, discouraged workers who are not actively searching for jobs anymore are not counted in the labor force. This understates the unemployment rate, especially in recession.

GDP Gap

This is the amount by which actual GDP falls short of potential GDP (the GDP that can be attained at the natural rate of unemployment).

Okun's Law

For every 1 percentage point that the actual unemployment rate exceeds the natural rate, a GDP gap of about 2% occurs. For example, if the actual rate is 6% and the natural rate is 4%, there will be a GDP gap of 4%.

III. Economic Models

Essentials

Law of Demand: inverse relationship between price and quantity demanded
Law of Supply: direct relationship between price and quantity supplied

MPS/MPC

MPS is the slope of the savings schedule. It is equal to $(\text{change in savings})/(\text{change in income})$

MPC is the slope of the consumption schedule. It is equal to $(\text{change in consumption})/(\text{change in income})$

$$\text{MPS} + \text{MPC} = 1.$$

The Multiplier Effect

A change in aggregate expenditures causes a greater increase in GDP because the same money is used many times over. The multiplier determines how much larger the increase in GDP is.

The multiplier's value can be found by the formula $\text{Multiplier} = 1/\text{MPS} = 1/(1 - \text{MPC})$

This multiplier is called the simple multiplier.

IV. Economic Policies

Fiscal Policy

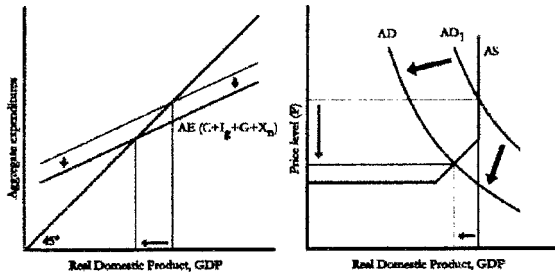
Tools

The government has three tools for regulating fiscal policy: a change in government spending (G), changes in taxes (T) or transfers (TR). The government can also use all if it thinks the economy needs it.

Inflationary Situation

If the inflation is demand-pull inflation, the government should use a contractionary fiscal policy. It can decrease government spending, increase taxes, or both. The government is aiming for a budget surplus, where tax revenues are larger than government spending.

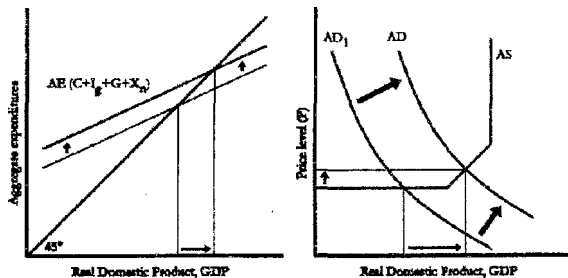
Both increased taxes and decreased government spending reduces consumption spending, which causes a decrease in aggregate demand (first graph). Then, if prices are flexible downward, the decrease in aggregate demand causes the equilibrium price level to decrease, ending the inflation. If prices are not flexible downward (because of the ratchet effect), the policy will stop price level from increasing. Since inflation usually occurs in the vertical range of the aggregate supply curve, GDP shouldn't decrease by much.



Graph 1 – Inflationary situation

Recessionary situation

The government now needs to use an expansionary fiscal policy. The aim of the policy is to increase aggregate demand, which shifts the AD curve to the right and will cause an increase in real GDP. The government has two tools to use: it can increase government spending or decrease taxes (or both). Increasing government spending will increase aggregate demand (since $AD = C + I_g + G + X_n$). Decreasing taxes will increase consumption spending (it increases it by the tax increase times the MPC), which will also increase aggregate demand (graph 2).



Graph 2 – Recessionary situation

Then, since aggregate demand is increased (rightward shift of AD curve), equilibrium GDP will either increase (if the economy is in the horizontal or intermediate ranges) or stop declining (if the economy is in the vertical range).

If the economy is on the horizontal range, the full effect of the multiplier will be felt: when AD increases by an amount, GDP will increase by the multiplier times that amount.

The final equilibrium will have a higher GDP and the same or slightly increased price level since recession usually means the horizontal range of the AS curve.

Impact of policies on AD/AS equilibrium

An expansionary fiscal policy shifts (or tries to shift) the Aggregate Demand curve to the right. This will shift the equilibrium GDP up (as long as the economy isn't in the vertical range) and shift the price level up (as long as the economy isn't in the horizontal range). Usually, the government uses an expansionary fiscal policy when the economy is in the horizontal range, so the policy only shifts equilibrium GDP up. A contractionary fiscal policy shifts the Aggregate Demand curve to the left. This will lower equilibrium price level (when it's not in horizontal range) and lower equilibrium GDP (when it's not in vertical range). However, the economy is usually in the vertical range when the government uses this policy, so the policy usually only shifts price level down.

G vs. C, I

G can be directly changed "on whim", since fiscal policy can quickly be enacted to change government spending. However, C and I are much more uncontrollable, since they both depend on confidence, which is a hard thing to change. They both, however, increase aggregate demand, and increase GDP by the amount times the multiplier.

Issue of Debt and Deficits

Deficit spending is expansionary, and it counters recession. There's two ways of financing a deficit. The government can enter the money market and borrow, competing with private business borrowers for funds. This might cause a crowding-out effect, "taking up" some space for investment spending and consumer spending. The crowding-out effect reduces the expansionary impact of the deficit spending. The government can also make more money, making spending increase without any harm done to investment. However, making more money can have an inflationary effect too. To counter demand-pull inflation, fiscal policy has to involve making a budget surplus. However, a surplus can do one of two things: debt reduction (paying off debt, but then it might offset the anti-inflationary impact because the government is putting money back into circulation), or impounding (keeping the surplus funds, doing nothing with them; this way, the full extent of the anti-inflationary policy will be met). Debt can actually be inflationary because if the government tries to pay it off quickly, there will be inflation because the money supply increases.

Crowding Out Effect

If the government were to finance a deficit (expansionary fiscal policy) by entering the money market and borrow money, it would make less room for investment, since as the government's share of the "pie" grows, everyone else's becomes smaller. Then, investment spending decreases, causing aggregate expenditures to not increase as much.

Balanced Budget Multiplier

Equal increases in government spending and taxation increase the equilibrium GDP. If G and T are both increased by an amount, the equilibrium GDP will rise by the same amount, regardless of what the multiplier is. This happens because a change in government spending has more of an impact on Aggregate Expenditure (AE) than a tax change. This is because government spending has a direct effect on AE, i.e. a \$20 increase in government spending will result in a \$20 increase in AE. However, since if people are taxed, their consumption only decreases by a fraction of the tax (since the tax affects both savings and consumption). For exam-

ple, a \$20 increase in taxes in an economy with a MPC of .75 only results in \$15 added to AE. Then, let's look at how much these values affect equilibrium GDP. Since the multiplier is 4, the \$20 increase by GDP results in a \$80 increase in GDP. Also, the \$15 decrease by taxes results in a \$60 decrease in GDP. Therefore, the net increase in GDP is $80 - 60$ which is \$20, the same as how much G and T were changed.

Monetary Policy

Who controls?

Within the vast majority of modern nations, special institutions (such as the Federal Reserve System in the United States, the Bank of England, the European Central Bank, the People's Bank of China the National Bank of the Republic of Belarus, the Reserve Bank of India, and the Bank of Japan) exist which have the task of executing the monetary policy and often independently of the executive. In general, these institutions are called central banks and often have other responsibilities such as supervising the smooth operation of the financial system.

Required reserve ratio

This is how much percent of a bank's reserves must keep on deposit with the Central Bank or as vault cash.

Money multiplier

Since banks lend their excess reserves, a system of banks will "magnify" original excess reserves into a larger amount of new demand-deposit money, causing the money supply to grow by more than the original excess reserves.

It is equal to $1/\text{Required reserve ratio}$

The maximum demand-deposit creation (money created) equals the excess reserves that can be lent out by commercial banks times the money multiplier. For example, if someone deposited \$100 into a bank, and the required reserve ratio was 0.2, then the bank's excess reserves would increase by \$80, and since the money multiplier is $1/0.2=5$, the money supply will be increased by $80 \times 5=400$.

Tools of Monetary Policy

It has three tools:

1. Open-market operations – these are the most important means the Central Bank as to control the money supply. It refers to the buying and selling of government bonds (securities) by the Central Bank. Buying bonds increases the money supply; selling them decreases it.

2. The reserve ratio – the Central Bank can also increase or decrease the Reserve ratio. Increasing the Reserve ratio decreases banks' excess reserves, causing the money supply to decrease. Decreasing it increases banks' excess reserves, increasing the money supply. This is really powerful, and so it is not used very often.

3. The discount rate – the discount rate is the rate the Central Bank charge for loans to commercial banks. When commercial banks borrow from FRBs, their reserves increase. Therefore, if the discount rate increases, banks are less encouraged to borrow, keeping their excess reserves the same and therefore restricting the money supply.

Open-market operations – difference between buying/selling to the public and buying/selling to banks

If the Central Bank buys or sells securities to the public, the money supply will increase/decrease less than if the Central Bank buys or sells them to banks. This is shown in the following examples:

Let's assume that the required reserve ratio is 0.2. The money multiplier is then 5. If the Central Bank buys \$1000 worth of securities from commercial banks, the excess reserves will increase by \$1000. Then, the money supply will increase by $\$1000 \times 5 = \5000 . If they buy securities from the public, the public gets more money, and when they deposit it into banks (whether directly or indirectly), bank reserves increase. However, since the required reserve ratio is 0.2, the bank needs to put \$200 of the money in the Central Bank's Reserve Bank, and so excess reserves only increase by \$800. Then, the money supply will increase by $\$800 \times 5 = \4000 . If the Central Bank sells \$1000 worth of securities to commercial banks, then excess reserves will decrease by \$1000, so the money supply will decrease by $\$1000 \times 5 = \5000 . If the Central Bank sells \$1000 of securities to the public, then after the transaction is cleared, the bank will have \$1000 less in securities. \$200 of that money can be taken from Federal reserves, and so excess reserves only decrease by \$800, causing the money supply to decrease by $\$800 \times 5 = \4000 .

The Demand for Money (Dm)

In deciding how much money to hold, people make a choice about how to hold their wealth. How much wealth shall be held as money and how much as other assets? For a given amount of wealth, the answer to this question will depend on the relative costs and benefits of holding money versus other assets. The demand for money is the relationship between the quantity of money people want to hold and the factors that determine that quantity.

The transactions demand for money is money people hold to pay for goods and services they anticipate buying.

The money people hold for contingencies represents their precautionary demand for money. Money held for precautionary purposes may include checking account balances kept for possible home repairs or health-care needs. People do not know precisely when the need for such expenditures will occur, but they can prepare for them by holding money so that they'll have it available when the need arises.

People also hold money for speculative purposes. Bond prices fluctuate constantly. As a result, holders of bonds not only earn interest but experience gains or losses in the value of their assets. Bondholders enjoy gains when bond prices rise and suffer losses when bond prices fall. Because of this, expectations play an important role as a determinant of the demand for bonds. Holding bonds is one alternative to holding money, so these same expectations can affect the demand for money.

John Maynard Keynes, who was an enormously successful speculator in bond markets himself, suggested that bondholders who anticipate a drop in bond prices will try to sell their bonds ahead of the price drop in order to avoid this loss in asset value. Selling a bond means converting it to money. Keynes referred to the speculative demand for money as the money held in response to concern that bond prices and the prices of other financial assets might change.

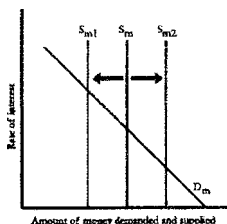
The Money supply (Sm)

The money supply or money stock, is the total amount of monetary assets available in an economy at a specific time.

M1, M2, M3

M1 is the narrowest definition of money supply. It includes currency (coins + paper money) and checkable deposits (demand deposits in banks or thrifts). M2 includes M1 plus near-monies (highly liquid financial assets which do not directly function as a medium of exchange but can be readily converted into currency or

checkable deposits without risk of financial loss). Near-monies are noncheckable savings accounts, money market deposit accounts, small time deposits, and money market mutual funds. M3 is M2 plus large time deposits.

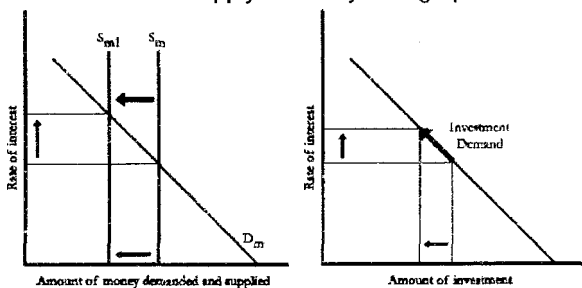


Graph 3 – Interest rate graph

D_m , or total demand for money, equals transaction demand plus asset demand. S_m is always vertical because quantity supplied doesn't vary with the rate of interest. When the money supply decreases (shifts to the left), the price for money (which is the same as the interest rate) rises. When the money supply increases (shifts to the right), the price for money decreases.

Inflationary situation

In this situation, we want a tight money policy. To do this, we can 1) sell government securities, 2) increase the reserve ratio, or 3) increase the discount rate. All three of these will decrease the supply of money. Our graphs will be as follows:



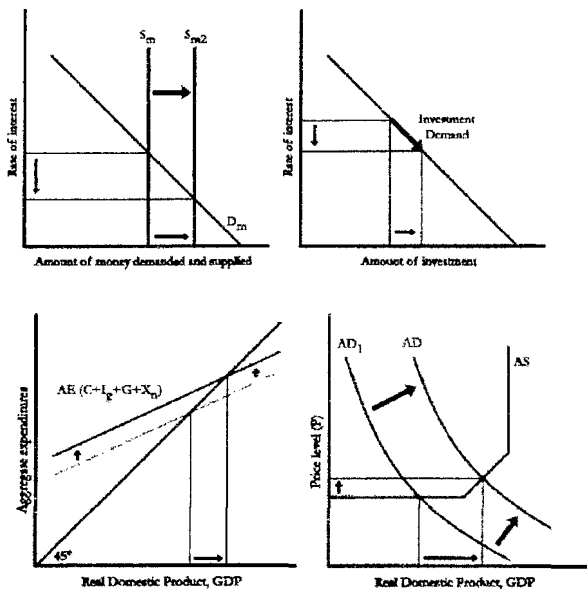
Graph 4 – Tight money policy

If supply of money decreases, then the rate of interest increases. Then, when the rate of interest increases, the amount of investment decreases. Then, since investment decreases, aggregate expenditures ($C+I_g+G+X_n$) decreases. That then shifts the GDP down by the change times the multiplier. Finally, when GDP decreases, price level will drop (since the economy most likely is in the vertical range of the aggregate supply curve) and therefore inflation will decrease.

Recessionary situation

In this situation, we want a loose money policy. To do this, we can 1) buy government securities, 2) decrease the reserve ratio, or 3) decrease the discount rate. All three of these will increase the supply of money. Our graphs will be as follows:

If supply of money increases, then the rate of interest decreases. Then, when the rate of interest decreases, the amount of investment increases.



Graph 5 – Loose money policy

Then, since investment increases, aggregate expenditures ($C+I_g+G+X_n$) increases. That then shifts the GDP up by the change times the multiplier. Finally, when GDP increases, price level will stay about the same (since this economy most likely started in the horizontal range). Now since the GDP is increasing, we are out of a recession.

Net export effect

Easy money policy decreased foreign demand for dollars. dollar depreciates net exports increase (AD increases, strengthening the easy money policy) Tight money policy increased foreign demand for dollars dollar appreciates net exports decrease (aggregate demand decreases, strengthening the tight money policy)

Both fiscal and monetary

Summary: recessionary

Fiscal policy: increase government spending, decrease taxes Monetary policy: loose money policy – buy government securities, lower reserve ratio, lower discount rate

Summary: inflationary Fiscal policy: decrease government spending, increase taxes Monetary policy: tight money policy – sell government securities, raise reserve ratio, raise discount rate.

V. Alternative Theories/Approaches

Stagflation

Stagflation is increasing inflation and rising unemployment in an economy at the same time. It is usually caused by a decrease in supply (supply-shock inflation). Stagflation in the 1970s proved that the Phillips Curve didn't represent a stable inflation-unemployment relationship.

Phillips CurveThe main concept of this is a stable, inverse relationship between inflation and unemployment. The short-run Phillips curve has a negative slope; the long-run Phillips curve is vertical.

The Adaptive Expectations Theory predicts that there is a short-run tradeoff between inflation and unemployment but there is no long-run tradeoff. In the short run, the inverse relationship works, but in the long run, it seems that the graph will always shift back to a vertical line.

Supply-side economicsThey believe that changes in aggregate supply are active forces in determining the levels of both inflation and unemployment. Economic disturbances can be generated on both the supply side and the demand side of the economy. They also contend that certain government policies have reduced the growth of aggregate supply over time, and if these policies were reversed, the economy could achieve low levels of unemployment without producing rapid inflation.

Supply-siders also say that the US tax-transfer system has "eroded" productivity and decreased incentives to work, invest, innovate, and assume entrepreneurial risks. If taxes were decreased, people would have more money after taxes and they would have more of an incentive to work.

Supply-siders also believe that reductions in marginal tax rates increase aggregate supply. They believe in the Laffer Curve, which says that up to a certain point in tax rate, tax revenue increases, and at that point, tax revenue is a maximum. However, when taxes go past that point, tax revenue starts to decrease again. Criticisms of the Laffer Curve include 1) evidence that tax cuts don't necessarily increase incentive to work, 2) inflation might still occur because AD might overwhelm AS, and 3) no one knows where we are on the curve.

"Old" Classical theory

They believe that the AS curve is vertical and it is the only factor in determining real output. The AD curve is still downsloping, and classical economists view it as stable when the money supply is constant. Also, domestic output doesn't change when price level decreases; it's only the AD curve moving down. They believe in Say's law, which says that supply creates its own demand.

"New" Classical theory

Their theory is that when the economy occasionally diverges from its full-employment output, internal mechanisms within the economy automatically move it back to that output. In their opinion, if a change in AD moves the equilibrium outside of ASLR, there will be a change in AS that will bring it back.

Rational Expectations

It states that businesses, consumers, and workers understand how government

Theory policies will affect the economy and anticipate the impacts in their own decision making. In other words, everyone knows what's going to happen and they plan for it. For example, when the government begins some expansionary policies, workers will anticipate that a result will be higher inflation which would cause a decrease in their real wages. So, the workers quickly ask for more money for their nominal wage. If things work out well, there will be no temporary increases in profit, output, or unemployment. They also say that policies designed to push unemployment below its natural rate will quickly increase the rate of inflation, having no effect on unemployment.

Monetarism

Monetarists believe that the economy is stable in the long run at the natural rate of unemployment, and the observed instability of the economy is caused by inappropriate monetary policy. Keynesians, on the other hand, believe that the economy is potentially unstable and observed instabilities are caused by fluctuations in AD and AS. They believe that changes in the money supply directly changes AD, which directly changes GDP. They do not think investment is an important issue. Monetarists also believe that without government interference, the economy would be very stable. The government caused the economy to become what it is today: downward wage inflexibility, business cycles, etc.

Monetarist Equation of $MV = PQ$, where M is the supply of money, V is the velocity of money (the number of Exchange times per year the average dollar is spent on final goods and services), P is the price level (average price at which each unit of physical output is sold), and Q is the physical volume of goods and services produced. The left side is the total amount spent; the right side is total amount received. Monetarists believe that V is stable, or that the factors altering velocity change gradually and predictably.

VI. International Aspects of the Economy

Absolute advantage

Absolute advantage refers to a country's ability to produce a certain good more efficiently than another country.

Comparative Advantage

Comparative advantage refers to a country's ability to produce a particular good with a lower opportunity cost than another country.

Exchange rates

Flexible exchange-rate system: rates at which national currencies are exchanged for one another are determined by demand and supply and in which no government intervention occurs. Fixed exchange-rate system: governments determine rates at which currencies are exchanged and make necessary adjustments in their economies to ensure that these rates continue

Appreciation/depreciation

When the currency depreciates, then American goods seem cheaper to foreigners, so of money they will buy more, increasing exports, and making the trade balance "more favorable". Likewise, when the currency appreciates, American goods seem more expensive to foreigners, and foreign goods seem cheaper to Americans, so imports increase and the trade balance becomes "less favorable".

Fiscal/Monetary policy

Fiscal

Expansionary policy higher domestic interest rate increased foreign demand for dollars dollar appreciates net exports decline balance of trade becomes less "favorable"
Contractionary policy lower domestic interest rate decreased foreign demand for dollars dollar depreciates net exports increase balance of trade becomes more "favorable".

Monetary

Easy money policy decreased foreign demand for dollars dollar depreciates net exports increase balance of trade becomes more "favorable"
Tight money policy increased foreign demand for dollars dollar appreciates net exports decrease balance of trade becomes less "favorable"

Favorable/unfavorable

If exports exceed imports, you get a trade surplus which is considered a "favorable trade balance/balance of trade". If imports exceed exports, you get a trade deficit which is considered an "unfavorable balance of trade". A "favorable" balance of trade is not entirely good, however. We cannot buy as much foreign goods now (since our dollar is worth less) so foreign companies don't get as much business from us. However, when foreign prices rise, Americans turn to American companies to buy things from, helping American companies make more money. Likewise, a "unfavorable" balance of trade isn't entirely bad either. Since our dollar has grown in value, we can buy more foreign goods, so foreign companies get more money. However, because of cheaper foreign goods, American companies won't get as much business (or they have to lower prices), so they don't get as much money.

VII. AD/AS Graph

Aggregate Demand

Shifters

These cause shifts in aggregate demand:

1. C (consumer wealth, consumer expectations, household indebtedness, taxes)
2. I (interest rates, expected returns on investment, business taxes, technology, degree of excess capacity)
3. G
4. Xn (National income abroad, exchange rates)

Aggregate Supply

Shifters

These cause shifts in aggregate supply:

1. Input Prices (domestic resource availability [land, labor, capital, entrepreneurial ability], prices of imported resources, market power)
2. Productivity
3. Legal – institutional environment (business taxes and subsidies, government regulation)

AS Curve ranges

Horizontal range – includes only real levels of output which are substantially less than full-employment output. A change in real output in this range won't affect price level at all.

Vertical range – economy has already reached its full-capacity real output. Any increase in the price level at this range won't affect real output at all.

Intermediate range – an expansion of real output is accompanied by a rising price level. The full-employment output is found in this range.

Useful formulas/expressions:

1. $MPC = \Delta C / \Delta DI$ or $\Delta C / \Delta Y^D$
2. $MPC + MPS = 1$
3. Exp. Multiplier = $1 / (1 - MPC)$
4. $\Delta GDP = \text{Exp Mult.} * \Delta AE$
5. $\Delta C = \Delta \text{Income} * MPC$
6. $AE = C + I + G + NX$
7. Labor Force = Unemployed + Employed
8. Unemployment Rate = $\text{Unemployed} / \text{Labor Force}$
9. Labor Force Participation Rate : $LF / \text{Working Age Populations}$

10. Real interest rate = nominal rate + inflation
11. Inflation: $[(\text{CPI yr 2} - \text{CPI yr 1}) / \text{CPI yr 1}] * 100$
12. $\text{CPI} = \text{P basket} / \text{P basket base}$
13. Real GDP = Nominal / $\{(100 + \% \text{ change in prices})/100\}$ or Real GDP = Nominal GDP/ GDP Deflator.

GDP

TESTS

1. GDP measures the economy's production of:
 - a. final goods and services.
 - b. intermediate goods.
 - c. consumer goods and services.
 - d. capital goods.
2. The three components of personal consumption expenditures are:
 - a. durable goods, nondurable goods, and services.
 - b. durable goods, food, and housing.
 - c. durable goods, nondurable goods, and housing.
 - d. durable goods, services, and food.
 - e. durable goods, services, and transportation.
3. The income that people earn in resource markets is called:
 - a. national income.
 - b. personal income.
 - c. disposable personal income.
 - d. transfer payments.
 - e. net national product.
4. Which of the following statements about GDP is correct?
 GDP measures two things at once: the total income of everyone in the economy and the unemployment rate.
 - a. Money continuously flows from households to government and then back to households, and GDP measures
 - b. this flow of money.
 - c. GDP is to a nation's economy as household income is to a household.
 - d. All of the above are correct.
5. In a simple circular-flow diagram *total income and total expenditure are*
 - a. never equal because total income always exceeds total expenditure.
 - b. seldom equal because of the ongoing changes in an economy's unemployment rate.
 - c. equal only when one dollar is spent on goods for every dollar that is spent on services.
 - d. always equal because every transaction has a buyer and a seller.
6. Anna is a homemaker. Last week, she was busy with her normal household chores. She is:
7. To compute GDP, we
 - a. add up the wages paid to all workers.
 - b. add up the costs of producing all final goods and services.
 - c. add up the market values of all final goods and services.
 - d. take the difference between the market value of all final goods and services and the cost of producing those final goods and services.

8. Which of the following is not included in GDP?
- unpaid cleaning and maintenance of houses
 - services such as those provided by lawyers and hair stylists
 - the estimated rental value of owner-occupied housing
 - production of foreign citizens living in the United States
9. Estimates of the values of which of the following non-market goods or services are included in GDP?
- the value of unpaid housework
 - the value of vegetables and other foods that people grow in their gardens
 - the estimated rental value of owner-occupied homes
 - All of the above are included.
10. ABC Company produces ink and sells it to XYZ Company, which makes pens. The ink produced by ABC Company is called
- an inventory good.
 - a transitory good.
 - a preliminary good.
 - an intermediate good.
11. The base year in the consumer price index (CPI) is:
- given a value of zero.
 - a year chosen as a reference for prices in all other years.
 - always the first year in the current decade.
 - established by law.
12. One way the consumer price index (CPI) differs from the GDP chain price index is that it:
- includes purchases of items bought by typical urban consumers.
 - uses only current year quantities.
 - is based on all final goods and services.
 - includes services.
13. An Italian company operates a pasta restaurant in Belarus. The profits from this pasta restaurant are included in
- Belarus GNP and Italian GNP.
 - Belarus GDP and Italian GDP.
 - Belarus GDP and Italian GNP.
 - Belarus GNP and Italian GDP.
14. Which of the following would understate the consumer price index?
- Substitution bias.
 - Deteriorating quality of products.
 - Improving quality of products.
 - Law of demand bias.
15. Disposable personal income is the income that
- households have left after paying taxes and non-tax payments to the government.
 - businesses have left after paying taxes and non-tax payments to the government.
 - households and noncorporate businesses have left after paying taxes and non-tax payments to the government.
 - households and businesses have left after paying taxes and non-tax payments to the government.

NUMERICAL PROBLEMS

1. Behold the following information on a fake economy:

Compensation of employees 2000

Disposable personal income 2500

Gross private domestic investment 200

Depreciation 300

Transfer Payments 400

Interest payments by consumers to business 30

Net Exports 250

(net) indirect business 55

Personal savings 500

Net interest 200

Personal transfer payments to foreigners 120

Government purchases 720

Net factor payments to rest of 40

Government transfer payments 640

Imports 210

Using some of the above information, calculate: GDP, NI

2. Consider an economy that produces only three types of fruit: apples, oranges, and bananas. In the base year (a few years ago), the production and price data were as follows:

Fruit	Quantity	Price
Apples	3,000 bags	\$2 per bag
Bananas	6,000 bunches	\$3 per bunch
Oranges	8,000 bags	\$4 per bag

a. Find nominal GDP in the current year and in the base year. What is the percentage increase since the base year?

b. Find real GDP in the current year and in the base year. By what percentage does real GDP increase from the base year to the current year?

c. Find the GDP deflator for the current year and the base year. By what percentage does the price level change from the base year to the current year?

d. Would you say that the percentage increase in nominal GDP in this economy since the base year is due more to increases in prices or increases in the physical volume of output?

3. You are given the following information about an economy:

Gross private domestic investment = 40

Government purchases of goods and services = 30

Gross national product (GNP) = 200

Current account balance = -20

Taxes = 60

Government transfer payments to the domestic private sector = 25

Interest payments from the government to the domestic

private sector = 15 (Assume all interest payments by the government go to domestic households.)

Factor income received from rest of world = 7

Factor payments made to rest of world = 9

Find the following, assuming that government investment is zero:

- Consumption
- Net exports
- GDP
- Net factor payments from abroad
- Private saving
- Government saving
- National saving

AD-AS model

1. Most economists believe that after a few years, changes in the money supply change

- only nominal variables, but not real variables.
- only real variables, but not nominal variables.
- neither nominal nor real variables.
- both nominal and real variables.

2. Real and nominal variables are highly intertwined, and changes in the money supply change real GDP. Most economists would agree that this statement accurately describes

- both the short run and the long run.
- the short run, but not the long run.
- the long run, but not the short run.
- neither the long run nor the short run.

3. The quantity of money has no real impact on things people really care about like whether or not they have a job. Most economists would agree that this statement is appropriate concerning

- both the short run and the long run.
- the short run, but not the long run.
- the long run, but not the short run.
- neither the long run nor the short run.

4. Classical economist David Hume observed that as the money supply expanded after gold discoveries it took some time for prices to rise and in the meantime the economy enjoyed higher employment and production. This is inconsistent with monetary neutrality because

a. *monetary neutrality would mean that neither prices nor production should have risen.*

b. *monetary neutrality would mean that production should have risen, but prices should not have.*

c. *monetary neutrality would mean the prices should have risen, but production should not have changed.*

d. *monetary neutrality would mean that prices and production should both have fallen.*

5. The model of short-run economic fluctuations focuses on the price level and

- real GDP.
- economic growth.

- c. the neutrality of money.
 - d. None of the above is correct.
6. The average price level is measured by
- a. any real variable.
 - b. the rate of inflation.
 - c. the level of the money supply.
 - d. the CPI or the GDP deflator.
7. Other things the same, as the price level rises, exchange rates
- a. and interest rates rise.
 - b. and interest rates fall.
 - c. fall and interest rates rise.
 - d. rise and interest rates fall.
8. Other things the same, as the price level rises, the real value of money
- a. and the exchange rate rise.
 - b. and the exchange rate fall.
 - c. rises and the exchange rate falls.
 - d. falls and the exchange rate rises.
9. Other things the same, an increase in the price level makes consumers feel
- a. less wealthy, so the quantity of goods and services demanded falls.
 - b. less wealthy, so the quantity of goods and services demanded rises.
 - c. more wealthy, so the quantity of goods and services demanded rises.
 - d. more wealthy, so the quantity of goods and services demanded falls.
10. Other things the same, a decrease in the price level makes the dollars people hold worth
- a. more, so they are willing to spend more.
 - b. more, so they are willing to spend less.
 - c. less, so they are willing to spend more.
 - d. less, so they are willing to spend less.
11. Other things the same, an increase in the price level makes the dollars people hold worth
- a. more, so they spend more.
 - b. more, so they spend less.
 - c. less, so they spend more.
 - d. less, so they spend less.
12. People will spend more if the price level
- a. rises because rising prices increase the real value of a dollar.
 - b. rises because rising prices decrease the real value of a dollar.
 - c. falls because falling prices increase the real value of a dollar.
 - d. falls because falling prices decrease the real value of a dollar.
13. People will spend more if real wealth
- a. and interest rates rise.
 - b. rises and interest rates fall.
 - c. falls and interest rates rise.
 - d. and interest rates fall.
14. Other things the same, if the price level falls, households
- a. increase foreign bond purchases, so the supply of dollars in the market for foreign-currency exchange increases.

b. increase foreign bond purchases, so the supply of dollars in the market for foreign-currency exchange decreases.

c. decrease foreign bond purchases, so the supply of dollars in market for foreign-currency exchange increases.

d. decrease foreign bond purchases, so the supply of dollars in the market for foreign-currency exchange decreases.

15. Other things the same, if the price level rises, households

a. increase foreign bond purchases, so the supply of dollars in the market for foreign-currency exchange increases.

b. increase foreign bond purchases, so the supply of dollars in the market for foreign-currency exchange decreases.

c. decrease foreign bond purchases, so the supply of dollars in the market for foreign-currency exchange increases.

d. decrease foreign bond purchases, so the supply of dollars in the market for foreign-currency exchange decreases.

16. Other things the same, the aggregate quantity of goods demanded in the U.S. increases if

a. real wealth falls.

b. the interest rate rises.

c. the dollar depreciates.

d. None of the above is correct.

17. Other things the same, the aggregate quantity of goods demanded in the U.S. increases if

a. real wealth rises.

b. the interest rate rises.

c. the dollar appreciates.

d. All of the above are correct.

18. Other things the same, the aggregate quantity of goods demanded decreases if

a. real wealth falls.

b. the interest rate rises.

c. the dollar appreciates.

d. All of the above are correct.

19. Suppose a stock market boom makes people feel wealthier. The increase in wealth would cause people to desire

a. increased consumption, which shifts the aggregate demand curve right.

b. increased consumption, which shifts the aggregate demand curve left.

c. decreased consumption, which shifts the aggregate demand curve right.

d. decreased consumption, which shifts the aggregate demand curve left.

20. Suppose a stock market crash makes people feel poorer. This decrease in wealth would induce people to

a. decrease consumption, which shifts aggregate supply left.

- b. decrease consumption, which shifts aggregate demand left.
- c. increase consumption, which shifts aggregate supply right.
- d. increase consumption, which shifts aggregate demand right.

21. From 2001 to 2005 there was a dramatic rise in the price of houses. If this made people feel wealthier, then it would shift

- a. aggregate demand right.
- b. aggregate demand left.
- c. aggregate supply right.
- d. aggregate supply left.

22. The Central Bank of Libertina increases the money supply at the same time the Parliament of Libertina passes a new investment tax credit. Consider the effects of these policies on the Libertinian economy. The money supply increase

- a. and the investment tax credit each cause aggregate demand to shift right.
- b. and the investment tax credit each cause aggregate demand to shift left.
- c. causes aggregate demand to right, while the investment tax credit causes aggregate demand to shift left.
- d. causes aggregate demand to shift left, while the investment tax credit causes the aggregate demand curve to shift right.

23. The initial impact of an increase in an investment tax credit is to shift

- a. aggregate demand right.
- b. aggregate demand left.
- c. aggregate supply right.
- d. aggregate supply left.

24. The initial impact of the repeal of an investment tax credit is to shift

- a. aggregate demand right.
- b. aggregate demand left.
- c. aggregate supply right.
- d. aggregate supply left.

Classical theory

1. Which of the following statements is true about Say's law?

- a. It states that supply creates its own demand.
- b. It states that demand creates its own supply.
- c. It states that total output will always exceed total spending.
- d. It states that consumption spending is the most volatile component of aggregate expenditures.
- e. It is a major proposition of the Keynesian model.

2. If the economy were left on its own without the interference of government or the Central Bank, it would move toward an equilibrium rate of growth that would produce, with only minor interruptions, full employment without inflation. What school supports this view?

- a. Classical.
- b. Keynesian.
- c. Monetarism.
- d. Supply-side.
- e. Neo-Keynesian.

3. Keynes once remarked that, in the long run, we're all dead. He was responding to the conventional wisdom of classical economics who argued that:
- the supply curve should remain vertical in the long run.
 - World War I was fought to free Britain from economic ruin.
 - depression was only a short-run, temporary departure from full-employment equilibrium.
 - funeral plots need to be determined by the market.
 - market-based realities cause the estate tax to be too high.
4. The classical theory of inflation
- is also known as the quantity theory of money.
 - was developed by some of the earliest economic thinkers.
 - is used by most modern economists to explain the long-run determinants of the inflation rate.
 - All of the above are correct.
5. The quantity theory of money
- is a fairly recent addition to economic theory.
 - can explain both moderate inflation and hyperinflation.
 - argues that inflation is caused by too little money in the economy.
 - All of the above are correct.
6. Which of the following observations was made famous by Adam Smith in his book *The Wealth of Nations*?
- There is no such thing as a free lunch.
 - People buy more when prices are low than when prices are high.
 - No matter how much people earn, they tend to spend more than they earn.
 - Households and firms interacting in markets are guided by an "invisible hand" that leads them to desirable market outcomes.
7. The term "invisible hand" was coined by
- Adam Smith.
 - David Ricardo.
 - Karl Marx.
 - Benjamin Franklin
8. Adam Smith argued that in a market system, when people act in their own self-interest, they typically
- help only themselves.
 - harm others.
 - help others, but not as much as they would have if they were not self-interested.
 - help others even more than when they deliberately try to help others.
9. Adam Smith's book *The Wealth of Nations* was published in
- 1692.
 - 1776.
 - 1816.
 - 1936.
10. According to Adam Smith, the success of decentralized market economies is primarily due to
- the basic benevolence of society.
 - society's legal system.
 - individuals' pursuit of self-interest.
 - partnerships that are forged between business and government.

11. Adam Smith asserted that a person should never attempt to make at home
- what it will cost him more to make than to buy.
 - any good in which that person does not have an absolute advantage.
 - any luxury good.
 - any necessity.
12. David Ricardo
- wrote a famous book in which he attacked the ideas of Adam Smith.
 - was the founder of modern economics.
 - argued that Britain should not restrict imports of grain.
 - wrote *An Inquiry into the Nature and Causes of the Wealth of Nations* in 1776.
13. David Ricardo, a millionaire stockbroker and economist,
- opposed the Corn Laws as a member of the British Parliament.
 - disputed Adam Smith's theory of specialization and trade in the early 1800s.
 - developed the principle of absolute advantage.
 - was an early supporter of trade restrictions.
14. *Laissez-faire* is a French expression which literally means
- to make do.
 - to get involved.
 - whatever works.
 - allow them to do.

NUMERICAL PROBLEMS

1. An economy with no government or foreign sector is represented below.

$$C = 500 + .6Y$$

$$I = 400$$

a. Calculate the following: Equilibrium gross domestic product, equilibrium *personal consumption expenditures*, equilibrium *personal savings*.

b. Change in investment required to achieve full employment GDP of 4000. Along with your specific numerical response, clearly indicate whether investment must increase or decline.

2. Suppose that the production function is $Y = 9K^{0.5}L^{0.5}$. With this production function, the marginal product of labor is $MP_L = 4.5K^{0.5}L^{-0.5}$. The capital stock is $K = 25$.

The labor supply curve is $L_S = 100[(1 - t)w]^2$, where w is the real wage rate, t is the tax rate on labor income, and hence $(1 - t)w$ is the after-tax real wage rate.

a. Assume that the tax rate on labor income, t , equals zero. Find the equation of the labor demand curve.

Calculate the equilibrium levels of the real wage and employment, the level of full-employment output, and the total after-tax wage income of workers.

b. Repeat part (a) under the assumption that the tax rate on labor income, t , equals 0.6.

c. Suppose that a minimum wage of $w = 2$ is imposed. If the tax rate on labor income, t , equals zero, what are the resulting values of employment

and the real wage? Does the introduction of the minimum wage increase the total income of workers, taken as a group?

Keynesian theory

1. A movement along a consumption function is caused by:
 - a. a change in households' real assets.
 - b. a change in interest rates.
 - c. changes in taxation policy.
 - d. expectations of price changes.
 - e. changes in households' disposable incomes.
2. If people's real assets increase, then the:
 - a. economy will move to the right along the existing consumption function.
 - b. economy will move to the left along the existing consumption function.
 - c. consumption function will shift down.
 - d. consumption function will shift up.
 - e. investment demand curve will shift up.
3. John Maynard Keynes's central proposition that a dollar increase in disposable income would increase consumption, but by less than the increase in disposable income implies a marginal propensity to consume (MPC) that is:
 - a. greater than or equal to one.
 - b. equal to one.
 - c. less than one but greater than zero.
 - d. negative.
4. The marginal propensity to consume (MPC) is computed as the change in consumption divided by the change in:
 - a. GDP.
 - b. disposable personal income.
 - c. saving.
 - d. none of the above.
5. The change in consumption divided by a change in disposable income is defined as:
 - a. the marginal propensity to consume.
 - b. autonomous consumption.
 - c. the consumption function.
 - d. Keynes' absolute disposable income hypothesis.
 - e. transitory consumption.
6. In the aggregate expenditures model, equilibrium occurs if:
 - a. consumption equals investment.
 - b. inventory equals investment.
 - c. aggregate expenditures equal consumption.
 - d. aggregate expenditures equal disposable income.
7. The effect of an increase in investment on real GDP will be greater, the larger the:
 - a. MPC.
 - b. APC.
 - c. MPS.
 - d. APS.
8. Suppose equilibrium real GDP is currently at \$800 billion and investment is \$100 billion. If an increase in the interest rate reduces investment from \$100 billion to \$75 billion, and the MPC is 0.8, the new level of equilibrium real GDP will be:
 - a. \$500 billion.

- b. \$600 billion.
 - c. \$675 billion.
 - d. \$775 billion.
 - e. \$800 billion.
9. Which of the following illustrates how the investment accelerator works?
- a. An increase in government expenditures increases the interest rate so that the Sleepwell Hotel chain decides to build fewer new hotels.
 - b. An increase in government expenditures increases aggregate spending so that the Sleepwell Hotel chain finds it profitable to build more new hotels.
 - c. An increase in government expenditures increases the interest rate so that the demand for stocks and bonds issued by the Sleepwell Hotel chain rises.
 - d. An increase in government expenditures decreases the interest rate so that the Sleepwell Hotel chain decides to build more new hotels.
10. Which of the following illustrates how the investment accelerator works?
- a. An increase in government expenditures increases aggregate spending so that Gas-n-Go decides to modernize its gas stations.
 - b. An increase in government expenditures increases the interest rate so that Gas-n-Go decides to modernize its gas stations.
 - c. An increase in government expenditures increases the interest rate so that the demand for stocks and bonds issued by Gas-n-Go rises.
 - d. An increase in government expenditures decreases the interest rate so that Gas-n-Go decides to modernize its gas stations.
11. The positive feedback from aggregate demand to investment is called
- a. the investment multiplier.
 - b. the stock-market effect.
 - c. the investment accelerator.
 - d. the crowding-in multiplier.
12. The marginal propensity to consume (MPC) is defined as the fraction of
- a. extra income that a household consumes rather than saves.
 - b. extra income that a household either consumes or saves.
 - c. total income that a household consumes rather than saves.
 - d. total income that a household either consumes or saves.
13. If the multiplier is 5, the MPC is
- a. 0.05.
 - b. 0.5.
 - c. 0.6.
 - d. 0.8.

NUMERICAL PROBLEMS

1. A consumer is making saving plans for this year and next. She knows that her real income after taxes will be \$50,000 in both years. Any part of her income saved this year will earn a real interest rate of 10% between this year and next year. Currently, the consumer has no wealth (no money in the bank or other financial assets, and no debts). There is no uncertainty about the future.

The consumer wants to save an amount this year that will allow her to (1) make college tuition payments next year equal to \$12,600 in real terms; (2) enjoy exactly the same amount of consumption this year and next year, not counting tuition payments as part of next year's consumption; and (3) have neither assets nor debts at the end of next year.

a. How much should the consumer save this year?

How much should she consume?

How are the amounts that the consumer should save and consume affected by each of the following changes (taken one at a time, with other variables held at their original values)?

b. Her current income rises from \$50,000 to \$54,200. c. The income she expects to receive next year rises from \$50,000 to \$54,200.

d. During the current year she receives an inheritance of \$1050 (an increase in wealth, not income).

e. The expected tuition payment for next year rises from \$12,600 to \$14,700 in real terms.

f. The real interest rate rises from 10% to 25%.

Fiscal policy

1. In the long run, fiscal policy primarily affects

a. aggregate demand. In the short run, it affects primarily aggregate supply.

b. aggregate supply. In the short run, it affects primarily saving, investment, and growth.

c. saving, investment, and growth. In the short run, it affects primarily aggregate demand.

d. saving, investment, and growth. In the short run, it affects primarily aggregate supply.

2. Fiscal policy refers to the idea that aggregate demand is changed by changes in

a. the money supply.

b. government spending and taxes.

c. trade policy.

d. All of the above are correct.

3. An increase in government spending initially and primarily shifts

a. aggregate demand right.

b. aggregate demand left.

c. aggregate supply right.

d. neither aggregate demand nor aggregate supply.

4. A decrease in government spending initially and primarily shifts

a. aggregate demand right.

b. aggregate demand left.

c. aggregate supply right.

d. neither aggregate demand nor aggregate supply.

5. In the short run an increase in government expenditures

a. raises the price level, but not real GDP.

b. raises real GDP, but not the price level.

c. raises real GDP and the price level.

d. raises neither real GDP nor the price level.

6. Which of the following shifts aggregate demand right?

a. an increase in government expenditures or a decrease in the price level

b. a decrease in government expenditures or an increase in the price level

c. an increase in government expenditures, but not a change in the price level

d. a decrease in the price level, but not an increase in government expenditures

7. Which of the following tends to make aggregate demand shift right farther than the amount government expenditures increase?

- a. the crowding-out effect
- b. the multiplier effect
- c. the wealth effect
- d. the interest-rate effect

8. The multiplier effect is the multiplied impact on

- a. the money supply of a given increase in government purchases.
- b. tax revenues of a given increase in government purchases.
- c. investment of a given increase in interest rates.
- d. aggregate demand of a given increase in government purchases.

9. Suppose that there is a multiplier effect that is greater than one and that there are no crowding out or investment accelerator effects. Which of the following would shift aggregate demand right by more than the increase in expenditures?

- a. an increase in government expenditures.
- b. an increase in net exports.
- c. an increase in investment spending.
- d. All of the above are correct.

10. The government buys a bridge. The owner of the company that builds the bridge pays her workers. The workers increase their spending. Firms that the workers buy goods from increase their output. This type of effect on spending illustrates

- a. the multiplier effect.
- b. the crowding-out effect.
- c. the Fisher effect.
- d. None of the above is correct.

11. The government buys new weapons systems. The manufacturers of weapons pay their employees. The employees spend this money on goods and services. The firms they buy goods and services from pay their employees. This illustrates

- a. the crowding-out effect.
- b. the multiplier effect.
- c. the Fisher effect.
- d. None of the above is correct.

12. Suppose the MPC is .75. There are no crowding out or investment accelerator effects. If the government increases expenditures by \$200 billion how far does aggregate demand shift? If the government decreases taxes by \$200 billion how far does aggregate demand shift?

- a. \$800 billion and \$800 billion
- b. \$800 billion and \$600 billion
- c. \$600 billion and \$600 billion
- d. \$600 billion and \$450 billion

13. Which of the following tends to make the size of a shift in aggregate demand resulting from a tax change smaller than otherwise?

- a. the multiplier effect
- b. the crowding-out effect
- c. the accelerator effect
- d. None of the above is correct.

14. If households view a tax cut as temporary, the tax cut
- has no effect on aggregate demand.
 - has more of an effect on aggregate demand than if households view it as permanent.
 - has the same effect as when households view the cut as permanent.
 - has less of an effect on aggregate demand than if households view it as permanent.
15. The economy is in long-run equilibrium. The aggregate demand curve shifts \$80 billion to the left. The government wants to change spending to offset this decrease in demand. The MPC is .75. Suppose the effect on aggregate demand of a tax change is $\frac{3}{4}$ as strong as the effect of a change in government expenditure. What should the government do if it wants to offset the decrease in real GDP?
- raise both taxes and expenditures by \$80 billion dollars.
 - raise both taxes and expenditures by \$10 billion dollars.
 - reduce both taxes and expenditures by \$80 billion dollars.
 - reduce both taxes and expenditures by \$10 billion dollars.
16. The government-purchases multiplier is defined as
- MPC.
 - $1 - \text{MPC}$.
 - $1/\text{MPC}$.
 - $1/(1 - \text{MPC})$.
17. The government purchases multiplier is defined as
- $1/\text{MPC}$.
 - $1/(1 - \text{MPC})$.
 - $\text{MPC}/(1 - \text{MPC})$.
 - $(1 - \text{MPC})/\text{MPC}$.
18. If the $\text{MPC} = \frac{3}{5}$, then the government purchases multiplier is
- $\frac{5}{3}$.
 - $\frac{5}{2}$.
 - 5.
 - 15.
19. When the government reduces taxes, which of the following decreases?
- consumption
 - take-home pay
 - household saving
 - None of the above is correct.
20. If taxes
- increase, consumption increases, aggregate demand shifts right.
 - increase, consumption decreases, aggregate demand shifts left.
 - decrease, consumption increases, aggregate demand shifts left.
 - decrease, consumption decreases, aggregate demand shifts right.
21. Assuming no crowding-out, investment-accelerator, or multiplier effects, a \$100 billion increase in government expenditures shifts aggregate demand
- right by more than \$100 billion.
 - right by \$100 billion.
 - left by more than \$100 billion.
 - left by \$100 billion.

22. The change in aggregate demand that results from fiscal expansion changing the interest rate is called the
- multiplier effect.
 - crowding-out effect.
 - accelerator effect.
 - Riccardian equivalence effect.
23. If there is crowding out, which of the following might decrease as government expenditures increased?
- real GDP
 - the demand for money curve
 - interest rates
 - demand for capital goods
24. Which of the following correctly explains the crowding-out effect?
- An increase in government expenditures decreases the interest rate and so increases investment spending.
 - An increase in government expenditures increases the interest rate and so reduces investment spending.
 - A decrease in government expenditures increases the interest rate and so increases investment spending.
 - A decrease in government expenditures decreases the interest rate and so reduces investment spending.
25. According to the crowding-out effect, an increase in government spending
- increases the interest rate and so increases investment spending.
 - increases the interest rate and so decreases investment spending.
 - decreases the interest rate and so increases investment spending.
 - decreases the interest rate and so decreases investment spending.
26. According to the crowding-out effect, a decrease in government spending
- increases the interest rate and so increases investment spending.
 - increases the interest rate and so decreases investment spending.
 - decreases the interest rate and so increases investment spending.
 - decreases the interest rate and so decreases investment spending.
27. To reduce the effects of crowding out caused by an increase in government expenditures, the Central Bankeral Reserve could
- increase the money supply by buying bonds.
 - increase the money supply by selling bonds.
 - decrease the money supply by buying bonds.
 - increase the money supply by selling bonds.
28. Sometimes during wars government expenditures are larger than normal. To reduce the effects this spending creates on interest rates
- the Central Bank could increase the money supply by buying bonds.
 - the Central Bank could increase the money supply by selling bonds.
 - the Central Bank could decrease the money supply by buying bonds.
 - the Central Bank could decrease the money supply by selling bonds.
29. If net exports fall \$20 billion and the MPC is $7/10$ and there is a multiplier effect, but no crowding out and no investment accelerator, then
- aggregate demand falls by $10/3 \times \$20$ billion.
 - aggregate demand falls by $7/3 \times \$20$ billion.
 - aggregate demand falls by $7/10 \times \$20$ billion.
 - None of the above is correct.

30. Suppose that there are both multiplier and crowding out effects but not accelerator effects. An increase in government expenditures would definitely
- shift aggregate demand right by a larger amount than the increase in government expenditures.
 - shift aggregate demand right by the same amount as the increase in government expenditures.
 - shift aggregate demand right by a smaller amount than the increase in government expenditures.
 - None of the above is correct.
31. Assume a multiplier effect, some crowding out and no accelerator effect. An increase in government expenditures changes aggregate demand more
- the smaller the MPC and the farther an increase in income shifts money demand.
 - the smaller the MPC and the less an increase in income shifts money demand.
 - the larger the MPC and the farther an increase in income shifts money demand.
 - the larger the MPC and the less an increase in income shifts money demand.

Phillips curve

- One determinant of the long-run average unemployment rate is the
 - market power of unions, while the inflation rate depends primarily upon government spending.
 - minimum wage, while the inflation rate depends primarily upon the money supply growth rate.
 - rate of growth of the money supply, while the inflation rate depends primarily upon the market power of unions.
 - existence of efficiency wages, while the inflation rate depends primarily upon the extent to which firms are competitive.
- In the long run, the inflation rate depends primarily on
 - the ability of unions to raise wages.
 - government spending.
 - the money supply growth rate.
 - the monopoly power of firms.
- In the long run,
 - the natural rate of unemployment depends primarily on the level of aggregate demand.
 - inflation depends primarily upon the money supply growth rate.
 - there is a tradeoff between the inflation rate and the natural rate of unemployment.
 - All of the above are correct.
- There is a
 - short-run tradeoff between inflation and unemployment.
 - short-run tradeoff between the actual unemployment rate and the natural rate of unemployment.
 - long-run tradeoff between inflation and unemployment.
 - long-run tradeoff between the actual unemployment rate and the natural rate of unemployment.

5. If policymakers decrease aggregate demand, the price level
 - a. falls, but unemployment rises.
 - b. and unemployment fall.
 - c. and unemployment rise.
 - d. rises, but unemployment falls.
6. If policymakers increase aggregate demand, the price level
 - a. falls, but unemployment rises.
 - b. and unemployment fall.
 - c. and unemployment rise.
 - d. rises, but unemployment falls.
7. In the short run, policy that changes aggregate demand changes
 - a. both unemployment and the price level.
 - b. neither unemployment nor the price level.
 - c. only unemployment.
 - d. only the price level.
8. If the government raises government expenditures, in the short run, prices
 - a. rise and unemployment falls.
 - b. fall and unemployment rises.
 - c. and unemployment rise.
 - d. and unemployment fall.
9. If the central bank increases the money supply, in the short run, prices
 - a. rise and unemployment falls.
 - b. fall and unemployment rises.
 - c. and unemployment rise.
 - d. and unemployment fall.
10. Unemployment would decrease and prices increase if
 - a. aggregate demand shifted right.
 - b. aggregate demand shifted left.
 - c. aggregate supply shifted right.
 - d. aggregate supply shifted left.
11. If policymakers expand aggregate demand, then in the long run
 - a. prices will be higher and unemployment will be lower.
 - b. prices will be higher and unemployment will be unchanged.
 - c. prices and unemployment will be unchanged.
 - d. None of the above is correct.
12. If policymakers decrease aggregate demand, then in the long run
 - a. prices will be lower and unemployment will be higher.
 - b. prices will be lower and unemployment will be unchanged.
 - c. inflation and unemployment will be unchanged.
 - d. None of the above is correct.
13. In the long run, policy that changes aggregate demand changes
 - a. both unemployment and the price level.
 - b. neither unemployment nor the price level.
 - c. only unemployment.
 - d. only the price level.
14. Suppose the Government instituted tax cuts. According to the short-run Phillips curve this change should have
 - a. reduced inflation and unemployment.

- b. raised inflation and unemployment.
- c. reduce inflation and raised unemployment.
- d. raised inflation and reduced unemployment.

15. The short-run relationship between inflation and unemployment is often called

- a. the Classical Dichotomy.
- b. Money Neutrality.
- c. the Phillips curve.
- d. the Keynesian cross.

16. Phillips found a

- a. positive relation between unemployment and inflation in the United Kingdom.
- b. positive relation between unemployment and inflation in the United States.
- c. negative relation between unemployment and inflation in the United States.
- d. negative relation between unemployment and inflation in the United Kingdom.

17. Phillips found a negative relation between

- a. output and unemployment.
- b. output and employment.
- c. wage inflation and output.
- d. wage inflation and unemployment.

18. A. W. Phillips' findings were based on data

- a. from 1861-1957 for the United Kingdom.
- b. from 1861-1957 for the United States.
- c. mostly from the post-World War II period in the United Kingdom.
- d. mostly from the post-World War II period in the United States.

19. If the short-run Phillips curve were stable, which of the following would be unusual?

- a. an increase in government spending and a fall in unemployment
- b. an increase in inflation and a decrease in output
- c. a decrease in the inflation rate and a rise in the unemployment rate
- d. a decrease in the money supply and a rise in unemployment.

20. Samuelson and Solow reasoned that when aggregate demand was high, unemployment was

- a. low, so there was upward pressure on wages and prices.
- b. low, so there was downward pressure on wages and prices.
- c. high, so there was upward pressure on wages and prices.
- d. high, so there was downward pressure on wages and prices.

21. Samuelson and Solow reasoned that when aggregate demand was low, unemployment was

- a. high, so there was upward pressure on wages and prices.
- b. high, so there was downward pressure on wages and prices.
- c. low, so there was upward pressure on wages and prices.
- d. low, so there was downward pressure on wages and prices.

22. Suppose that a central bank increases the money supply. According to the logic of the Phillips curve this should make

- a. prices, output, and employment rise.
- b. prices and output rise, employment fall.
- c. prices rise and output and employment fall.
- d. prices fall, output, and employment rise.

23. Suppose that the money supply increases. In the short run this increases employment according to
- both the short-run Phillips curve and the aggregate demand and aggregate supply model.
 - neither the short-run Phillips curve nor the aggregate demand and aggregate supply model.
 - the short-run Phillips curve, but not the aggregate demand and supply model.
 - the aggregate demand and aggregate supply model, but not the short-run Phillips curve.
24. Suppose that the money supply increases. In the short run, this increases prices according to
- both the short-run Phillips curve and the aggregate demand and aggregate supply model.
 - neither the short-run Phillips curve nor the aggregate demand and aggregate supply model.
 - the short-run Phillips curve, but not the aggregate demand and aggregate supply model.
 - the aggregate demand and aggregate supply model but not the short-run Phillips curve.
25. Samuelson and Solow believed that the Phillips curve
- implied that low unemployment was associated with low inflation.
 - indicated that the aggregate supply and aggregate demand model was incorrect.
 - offered policymakers a menu of possible economic outcomes from which to choose.
 - All of the above are correct.

NUMERICAL PROBLEMS

Consider an economy in long-run equilibrium with an inflation rate, π , of 12% per year and a natural unemployment rate, u , of 6%. The expectations augmented Phillips curve is $\pi = \pi^e - 2(u - u)$.

Assume that Okun's law holds so that a 1 percentage point increase in the unemployment rate maintained for one year reduces GDP by 2% of full-employment output.

a. Consider a two-year disinflation. In the first year $\pi = 0.04$ and $\pi^e = 0.08$. In the second year $\pi = 0.04$ and $\pi^e = 0.04$. In the first year, what is the unemployment rate? By what percentage does output fall short of full-employment output? In the second year, what is the unemployment rate? By what percentage does output fall short of full-employment output?

What is the sacrifice ratio for this disinflation?

b. Now consider a four-year disinflation according to the following table:

Year	1	2	3	4
π	0.08	0.04	0.04	0.04
π^e	0.10	0.08	0.06	0.04

What is the unemployment rate in each of the four years? By what percentage does output fall short of full-employment output each year? What is the sacrifice ratio for this disinflation?

2. Consider the following extended classical economy (in which the misperceptions theory holds):

$$\text{AD} \quad Y = 300 + 10(M/P).$$

$$\text{SRAS} \quad Y = Y + P - P^e.$$

$$\text{Okun's law} \quad (Y - Y^*)/Y^* = -2(u - u^*).$$

$$\text{Full-employment output} \quad Y = 500.$$

$$\text{Natural unemployment rate} \quad u = 0.06.$$

a. Suppose that the money supply $M = 1000$ and that the expected price level $P^e = 50$. What are the short-run equilibrium values of output, Y , the price level, P , and the unemployment rate, u ? What are the long-run equilibrium values of these three variables?

b. Now suppose that an unanticipated increase raises the nominal money supply to $M = 1260$. What are the new short-run equilibrium values of output, Y , the price level, P , and the unemployment rate, u ? What are the new long-run equilibrium values of these three variables? In general, are your results consistent with an expectations-augmented Phillips curve?

3. In a certain economy the expectations-augmented

$$\text{Phillips curve is } \pi = \pi^e - 2(u - u^*) \text{ and } u = 0.06.$$

a. Graph the Phillips curve of this economy for an expected inflation rate of 0.10. If the Central Bank chooses to keep the actual inflation rate at 0.10, what will be the unemployment rate?

b. An aggregate demand shock (resulting from increased military spending) raises expected inflation to 0.12 (the natural unemployment rate is unaffected). Graph the new Phillips curve and compare it to the curve you drew in Part (a). What happens to the unemployment rate if the Central Bank holds actual inflation at 0.10? What happens to the Phillips curve and the unemployment rate if the Fed announces that it will hold inflation at 0.10 after the aggregate demand shock, and this announcement is fully believed by the public?

c. Suppose that a supply shock (a drought) raises expected inflation to 0.12 and raises the natural unemployment rate to 0.08.

4. An economy is described by the following equations:

$$\text{AD} \quad Y = 4000 + 2(M/P)$$

$$\text{SRAS} \quad Y = Y + 100(P - P^e)$$

$$\text{Okun's law} \quad (Y - Y^*)/Y^* = -2(u - u^*).$$

In this economy full-employment output Y equals 6000 and the natural unemployment rate u equals 0.05.

a. Suppose that the nominal money supply has long been constant at $M = 4000$ and is expected by the public to remain constant forever. What are the equilibrium values of the price level, P , the expected price level, P^e , expected inflation, π , output, Y , and the unemployment rate, u ?

b. A totally unexpected increase in the money supply occurs, raising it from 4000 to 4488. What are the short-run equilibrium values of the price level, expected price level, output, and unemployment rate? What are the values of cyclical unemployment and unanticipated inflation?

c. What is the slope of the expectations-augmented Phillips curve (equal to $-h$ in Eq. 12.1) in this economy?

Monetary policy

1. When the money market is drawn with the value of money on the vertical axis, long-run equilibrium is obtained when the quantity demanded and quantity supplied of money are equal due to adjustments in the

- the value of money.
- real interest rates.
- nominal interest rates.
- money supply.

2. When the money market is drawn with the value of money on the vertical axis, if the price level is above the equilibrium level, there is an

- excess demand for money, so the price level will rise.
- excess demand for money, so the price level will fall.
- excess supply of money, so the price level will rise.
- excess supply of money, so the price level will fall.

3. When the money market is drawn with the value of money on the vertical axis, if the value of money is below the equilibrium level,

- the price level will rise.
- the value of money will rise.
- money demand will shift left.
- money demand will shift right.

4. Suppose the money market, drawn with the value of money on the vertical axis, is in equilibrium. If the money supply increases, then at the old value of money there is

- a shortage that will increase spending.
- a shortage that will reduce spending.
- a surplus that will increase spending.
- a surplus that will reduce spending.

5. Which of the following is correct?

a. If the Central Bank purchases bonds in the open market, then the money supply curve shifts right. A change in the price level does not shift the money supply curve.

b. If the Central Bank sells bonds in the open market, then the money supply curve shifts right. A change in the price level does not shift the money supply curve.

c. If the Central Bank purchases bonds, then the money supply curve shifts right. An increase in the price level shifts the money supply curve right.

d. If the Central Bank sells bonds, then the money supply curve shifts right. A decrease in the price level shifts the money supply curve right.

6. When the money market is drawn with the value of money on the vertical axis, an increase in the money supply shifts the money supply curve to the

- right, lowering the price level.
- right, raising the price level.
- left, raising the price level.
- left, lowering the price level.

7. If the Central Bank raises the money supply, then $1/P$

- falls, so the value of money falls.
- falls, so the value of money rises.
- rises, so the value of money falls.
- rises, so the value of money rises.

8. When the money market is drawn with the value of money on the vertical axis, an increase in the money supply
- increases the price level and the value of money.
 - increases the price level and decreases the value of money.
 - decreases the price level and increases the value of money.
 - decreases the price level and the value of money.
9. When the money market is drawn with the value of money on the vertical axis, an increase in the money supply causes the equilibrium value of money
- and equilibrium quantity of money to increase.
 - and equilibrium quantity of money to decrease.
 - to increase, while the equilibrium quantity of money decreases.
 - to decrease, while the equilibrium quantity of money increases.
10. When the money market is drawn with the value of money on the vertical axis, if the Central Bank sells bonds then
- the money supply and the price level increase.
 - the money supply and the price level decrease.
 - the money supply increases and the price level decreases.
 - the money supply increases and the price level increases.
11. When the money market is drawn with the value of money on the vertical axis, the value of money increases if
- either money demand or money supply shifts right.
 - either money demand or money supply shifts left.
 - money demand shifts right or money supply shifts left.
 - money demand shifts left or money supply shifts right.
12. When the money market is drawn with the value of money on the vertical axis, the price level increases if
- either money demand or money supply shifts right.
 - either money demand or money supply shifts left.
 - money demand shifts right or money supply shifts left.
 - money demand shifts left or money supply shifts right.
13. When the money market is drawn with the value of money on the vertical axis, the price level decreases if
- either money demand or money supply shifts right.
 - either money demand or money supply shifts left.
 - money demand shifts right or money supply shifts left.
 - money demand shifts left or money supply shifts right.
14. As the reserve ratio increases, the money multiplier
- increases.
 - does not change.
 - decreases.
 - could do any of the above.
15. If the central bank in some country lowered the reserve ratio, the money multiplier
- would increase.
 - would not change.
 - would decrease.
 - could do any of the above.

16. If the reserve ratio is 2.5 percent, the money multiplier is
- 40.
 - 25.
 - 2.5.
 - 1.25.
17. If the reserve ratio is 4 percent, the money multiplier is
- 25
 - 20
 - 4
 - 2
18. To increase the money supply, the Central Bank could
- sell government bonds.
 - decrease the discount rate.
 - increase the reserve requirement.
 - None of the above is correct.
19. The money supply increases when the Central Bank
- buys bonds. The increase will be larger the smaller the reserve ratio is.
 - buys bonds. The increase will be larger the larger the reserve ratio is.
 - sells bonds. The increase will be larger the smaller the reserve ratio is.
 - sells bonds. The increase will be larger the larger the reserve ratio is.

NUMERICAL PROBLEMS

1. The monetary base is \$1,000,000. The public always holds half its money supply as currency and half as deposits. Banks hold 20% of deposits in the form of reserves. Starting with the initial creation of a monetary base that accompanies the purchase by the central bank of \$1,000,000 worth of securities from the public, show the consolidated balance sheet of the banks after they first receive deposits, after a first round of loans and redeposits, and after a second round of loans and redeposits. (Hint: Don't forget that the public keeps only half its money in the form of bank deposits.)

Show the balance sheets of the central bank, the banking system, and the public at the end of the process of multiple expansion of loans and deposits. What is the final value of the money supply?

2. a. The money supply is \$6,000,000, currency held by the public is \$2,000,000, and the reserve-deposit ratio is 0.25. Find deposits, bank reserves, the monetary base, and the money multiplier.

b. In a different economy, vault cash is \$1,000,000, deposits by depository institutions at the central bank are \$4,000,000, the monetary base is \$10,000,000, and bank deposits are \$20,000,000. Find bank reserves, the money supply, and the money multiplier.

3. When the real interest rate increases, banks have an incentive to lend a greater portion of their deposits, which reduces the reserve-deposit ratio. In particular, suppose that $res = 0.4 - 2r$, where res is the reserve-deposit ratio and r is the real interest rate. The currency-deposit ratio is 0.4, the price level is fixed at 1.0, and the monetary base is 60. The real quantity of money demanded is $L(Y, i) = 0.5Y - 10i$, where Y is real output and i is the nominal interest rate.

Assume that expected inflation is zero so that the nominal interest rate and the real interest rate are equal.

a. If $r = i = 0.10$, what are the reserve-deposit ratio, the money multiplier, and the money supply? For what real output, Y , does a real interest rate of 0.10 clear the asset market?

b. Repeat Part (a) for $r = i = 0.05$.

c. Suppose that the reserve-deposit ratio is fixed at the value you found in Part (a) and isn't affected by interest rates. If $r = i = 0.05$, for what output, Y , does the asset market clear in this case?

d. Is the LM curve flatter or steeper when the reserve-deposit ratio depends on the real interest rate than when the reserve-deposit ratio is fixed? Explain your answer in economic terms.

Economic growth

1. A nation's standard of living is measured by its

- real GDP.
- real GDP per person.
- nominal GDP.
- nominal GDP per person.

2. Real GDP per person

a. minus real GDP per person from the previous period equals the growth rate of real GDP per person.

b. provides more meaningful comparisons across time and countries than real GDP.

c. provides a less useful measure of the standard of living than nominal GDP per person.

d. All of the above are correct.

2. If one wants to know how the material well-being of the average person has changed over time in a given country, one should look at the

- level of real GDP.
- growth rate of nominal GDP.
- growth rate of real GDP.
- growth rate of real GDP per person.

3. Over the past century in the United States, real GDP per person has grown by about

- 1 percent per year.
- 2 percent per year.
- 3 percent per year.
- 4 percent per year.

4. During the past century the average growth rate of U.S. real GDP per person implies that it doubled about every

- 100 years on average.
- 70 years.
- 35 years.
- 25 years.

5. An understanding of the best ways to produce goods and services is called

- human capital.
- physical capital.
- technology.
- productivity.

6. In the United States, as measured by real GDP per person, average income is about how many times as high as average income a century ago?

- a. 2
- b. 4
- c. 6
- d. 8

7. Suppose there are constant returns to scale. Now suppose that over time a country doubles its workers, its natural resources, and its human capital, but its technology is unchanged. Which of the following would double?

- a. both output and productivity
- b. output, but not productivity
- c. productivity, but not output
- d. neither productivity nor output

8. Over the last century, US real GDP per person grew at a rate of about

- a. 2% per year, so that it is now 2 times as high as it was a century ago.
- b. 2% per year, so that it is now 8 times as high as it was a century ago.
- c. 4% per year, so that it is now 2 times as high as it was a century ago.
- d. 4% per year, so that it is now 8 times as high as it was a century ago.

9. If there are constant returns to scale, the production function can be written as

- a. $xY = 2xAF(L, K, H, N)$.
- b. $Y/L = A F(xL, xK, xH, xN)$.
- c. $Y/L = A F(1, K/L, H/L, N/L)$.
- d. $L = AF(Y, K, H, N)$.

10. The level of real GDP person

a. differs widely across countries, but the growth rate of real GDP per person is similar across countries.

b. is very similar across countries, but the growth rate of real GDP per person differs widely across countries.

c. and the growth rate of real GDP per person are similar across countries.

d. and the growth rate of real GDP per person vary widely across countries.

11. Income in developing countries like India and Indonesia

a. is less than 1/7th of that in developed countries like Japan and the United States.

b. is about 1/5th of that in developed countries like Japan and the United States.

c. is about 1/3 of that in developed countries like Japan and the United States.

d. is about 1/2 of that in developed countries like Japan and the United States.

12. If the number of workers in an economy doubled, all other inputs stayed the same, and there were constant returns

to scale, productivity would

a. fall to less than half its former value.

b. fall but by less than half.

c. stay the same.

d. rise but less than double.

13. If the production function for an economy had constant returns to scale, the labor force doubled, and all other inputs stayed the same, then real GDP would

a. stay the same.

b. increase by 50 percent.

c. increase, but by something less than double.

d. double.

14. If your firm has constant returns to scale, then if you doubled all your inputs your firm's output would
- not change.
 - increase, but by less than double.
 - double.
 - more than double.
15. You bake cookies. One day you double the time you spend, double the number of chocolate chips, flour, eggs, and all your other inputs, and bake twice as many cookies. Your cookie production function has
- decreasing returns to scale.
 - zero returns to scale.
 - constant returns to scale.
 - increasing returns to scale.

NUMERICAL PROBLEMS

1. For a particular economy, the following capital input K and labor input N were reported in four different years:

Year	K	N
1	200	1000
2	250	1000
3	250	1250
4	300	1200

The production function in this economy is

$$Y = K^{0.3}N^{0.7} \text{ where } Y \text{ is total output.}$$

- Find total output, the capital-labor ratio, and output per worker in each year. Compare year 1 with year 3 and year 2 with year 4. Can this production function be written in per-worker form? If so, write algebraically the per-worker form of the production function.
 - Repeat Part (a) but assume now that the production function is $Y = K^{0.3}N^{0.8}$.
2. An economy has the per-worker production function $Y_t = 3k_t^{0.5}$ where Y_t is output per worker and k_t is the capital-labor ratio. The depreciation rate is 0.1, and the population growth rate is 0.05. Saving is $S_t = 0.3Y_t$, where S_t is total national saving and Y_t is total output.
- What are the steady-state values of the capital-labor ratio, output per worker, and consumption per worker?
- The rest of the problem shows the effects of changes in the three fundamental determinants of long-run living standards.
- Repeat Part (a) for a saving rate of 0.4 instead of 0.3.
 - Repeat Part (a) for a population growth rate of 0.08 (with a saving rate of 0.3).

Open economy

1. In the open-economy macroeconomic model, other things the same, a decrease in the interest rate shifts
- the demand for dollars in the market for foreign-currency exchange to the right.
 - the demand for dollars in the market for foreign-currency exchange to the left.
 - the supply of dollars in the market for foreign-currency exchange to the right.
 - the supply of dollars in the market for foreign-currency exchange to the left.

In an open economy,

- a. net capital outflow = imports.
- b. net capital outflow = net exports.
- c. net capital outflow = exports.
- d. None of the above is correct.
- d. None of the above is correct.

3. In the open-economy macroeconomic model, the key determinant of net capital outflow is the

- a. nominal exchange rate.
- b. nominal interest rate.
- c. real exchange rate.
- d. real interest rate.

4. 34. Which of the following is correct in an open economy?

- a. $S = I$
- b. $S = NX + NCO$
- c. $S = NCO$
- d. $S = I + NCO$

5. The variable that links the market for loanable funds and the market for foreign-currency exchange is

- a. net capital outflow.
- b. national saving.
- c. exports.
- d. domestic investment.

6. If net exports are positive, then

- a. exports are greater than imports.
- b. net capital outflow is negative.
- c. both of the above are correct.
- d. neither of the above is correct.

7. The price that balances supply and demand in the market for foreign-currency exchange in the open-economy macroeconomic model is the

- a. nominal exchange rate.
- b. nominal interest rate.
- c. real exchange rate.
- d. real interest rate.

8. If the real exchange rate for the dollar is above the equilibrium level, the quantity of dollars supplied in the market for foreign-currency exchange is

- a. greater than the quantity demanded and the dollar will appreciate.
- b. greater than the quantity demanded and the dollar will depreciate.
- c. less than the quantity demanded and the dollar will appreciate.
- d. less than the quantity demanded and the dollar will depreciate.

9. In the market for foreign-currency exchange in the open economy macroeconomic model, the amount of net capital outflow represents the quantity of dollars

- a. supplied for the purpose of selling assets domestically.
- b. supplied for the purpose of buying assets abroad.
- c. demanded for the purpose of buying U.S. net exports of goods and services.
- d. demanded for the purpose of importing foreign goods and services.

10. In the open economy macroeconomic model net capital outflow is equal to the quantity of
- dollars supplied in the foreign exchange market.
 - dollars demand in the foreign exchange market.
 - funds supplied in the loanable funds market.
 - None of the above is correct.
11. Net capital outflow is equal to
- national saving minus the trade balance.
 - domestic investment plus national saving.
 - national saving minus domestic investment.
 - domestic investment minus national saving.
12. The value of net exports equals the value of
- national saving.
 - public saving.
 - national saving - net exports.
 - national saving - domestic investment.
13. Suppose that the real exchange rate is such that the market for foreign-currency exchange has a surplus
- this will lead to an appreciation of the dollar, an increase in U.S. net exports, and so an increase in the quantity of dollars demanded in the foreign exchange market.
 - this will lead to an appreciation of the dollar, a decrease in U.S. net exports, and so a decrease in the quantity of dollars demanded in the foreign exchange market.
 - this will lead to a depreciation of the dollar, an increase in U.S. net exports, and so an increase in the quantity of dollars demanded in the foreign exchange market.
 - this will lead to a depreciation of the dollar, a decrease in U.S. net exports, and so a decrease in the quantity of dollars demanded in the foreign exchange market.
14. Which of the following is included in the demand for dollars in the market for foreign-currency exchange in the open-economy macroeconomic model?
- A firm in Belarus wants to buy corn from a Poland firm.
 - A Japanese bank desires to purchase U.S. Treasury securities.
 - German citizen wants to buy a bond issued by a Russian corporation.
 - All of the above are correct.
15. Which of the following is included in the supply of dollars in the market for foreign-currency exchange in the open-economy macroeconomic model?
- A retail outlet in Russia wants to buy semi-conductors from a U.S. manufacturer.
 - A U.S. bank loans dollars to Blair, a U.S. resident, who wants to purchase a new house in the United States.
 - A U.S. based mutual fund wants to purchase bonds issued by an Italian corporation.
 - All of the above are correct.
16. Which of the following would tend to shift the supply of dollars in the market for foreign-currency exchange in the open-economy macroeconomic model to the right?
- The exchange rate rises.
 - The exchange rate falls.

- c. The expected rate of return on U.S. assets rises.
 d. The expected rate of return on U.S. assets falls.
17. Which of the following would tend to shift the supply of dollars in the market for foreign-currency exchange of the open-economy macroeconomic model to the left?
- a. The exchange rate rises.
 b. The exchange rate falls.
 c. The expected rate of return on U.S. assets rises.
 d. The expected rate of return on U.S. assets falls.
18. The theory of purchasing-power parity implies that the demand curve for foreign-currency exchange is
- a. downward sloping.
 b. upward sloping.
 c. horizontal.
 d. vertical.
19. In the open-economy macroeconomic model, the quantity of dollars demanded in the market for foreign-currency exchange
- a. depends on the real exchange rate. The quantity of dollars supplied in the foreign-exchange market depends on the real interest rate.
 b. depends on the real interest rate. The quantity of dollars supplied in the foreign-exchange market depends on the real exchange rate.
 c. and the quantity of dollars supplied in the market for foreign-currency exchange depend on the real exchange rate.
 d. and the quantity of dollars supplied in the market for foreign-currency exchange depend on the real interest rate.
20. At a given real exchange rate, which of the following, by itself, would increase the supply of dollars in the market for foreign-currency exchange?
- a. foreign citizens buy more U.S. bonds
 b. U.S. citizens buy more foreign bonds
 c. foreign citizens buy more U.S. goods
 d. U.S. citizens buy more foreign goods
21. If the real exchange rate for the dollar is below the equilibrium level, the quantity of dollars supplied in the market for foreign-currency exchange is
- a. less than the quantity demanded and the dollar will appreciate.
 b. less than the quantity demanded and the dollar will depreciate.
 c. greater than the quantity demanded and the dollar will appreciate.
 d. greater than the quantity demanded and the dollar will depreciate.
22. The real exchange rate measures the
- a. price of domestic currency relative to foreign currency.
 b. price of domestic goods relative to the price of foreign goods.
 c. rate of domestic and foreign interest.
 d. None of the above is correct.

NUMERICAL PROBLEMS

1. Here are some balance of payments data (without pluses and minuses):
 Exports of goods, 100
 Imports of goods, 125
 Service exports, 90
 Service imports, 80

Income receipts from abroad, 110
 Income payments to foreigners, 150
 Increase in home country's ownership of assets abroad, 160
 Increase in foreign ownership of assets in home country, 200
 Increase in home reserve assets, 30
 Increase in foreign reserve assets, 35

Assuming that unilateral transfers equal zero, find net exports, the current account balance, the capital and financial account balance, the official settlements balance, and the statistical discrepancy. (Note: The increase in home reserve assets of 30 is included in the increase in the home country's ownership of assets abroad of 160, and the increase in foreign reserve assets of 35 is included in the increase in foreign ownership of assets in the home country of 200.)

In a small open economy,
 desired national saving, $sd = \$10 \text{ billion}$
 $\quad + (\$100 \text{ billion})r^w$;
 desired investment, $Id = \$15 \text{ billion}$
 $\quad - (\$100 \text{ billion})r^w$;

output, $Y = \$50 \text{ billion}$;
 government purchases, $G = \$10 \text{ billion}$;
 world real interest rate, $r^w = 0.03$.

a. Find the economy's national saving, investment, current account surplus, net exports, desired consumption, and absorption.

b. Owing to a technological innovation that increases future productivity, the country's desired investment rises by \$2 billion at each level of the world real interest rate. Repeat Part (a) with this new information.

4. Consider two large open economies, the home economy and the foreign economy. In the home country the following relationships hold:

desired consumption, $Cd = 320 + 0.4(Y - T) - 200r^w$;
 desired investment, $Id = 150 - 200r^w$;
 output, $Y = 1000$;
 taxes, $T = 200$;
 government purchases, $G = 275$.

In the foreign country the following relationships hold:
 desired consumption, $Cd_{For} = 480 + 0.4(Y_{For} - T_{For}) - 300r^w$;
 desired investment, $Id_{For} = 225 - 300r^w$;
 output, $Y_{For} = 1500$;
 taxes, $T_{For} = 300$;
 government purchases, $G_{For} = 300$.

a. What is the equilibrium interest rate in the international capital market? What are the equilibrium values of consumption, national saving, investment, and the current account balance in each country?

b. Suppose that in the home country government purchases increase by 50 to 325. Taxes also increase by 50 to keep the deficit from growing. What is the new equilibrium interest rate in the international capital market? What are the new equilibrium values of consumption, national saving, investment, and the current account balance in each country?

5. Consider a world with only two countries, which are designated the home country (H) and the foreign country (F). Output equals its full-employment level in

each country. You are given the following information about each country:

Home Country

Consumption:	$C_H = 100 + 0.5Y_H - 500r^w$
Investment:	$I_H = 300 - 500r^w$
Government Purchases:	$G_H = 155$
Full-employment Output:	$Y_H = 1000$

Foreign Country

Consumption:	$C_F = 225 + 0.7Y_F - 600r^w$
Investment:	$I_F = 250 - 200r^w$
Government Purchases:	$G_F = 190$
Full-employment Output:	$Y_F = 1200$

- Write national saving in the home country and in the foreign country as functions of the world real interest rate r^w .
- What is the equilibrium value of the world real interest rate?
- What are the equilibrium values of consumption, national saving, investment, the current account balance, and absorption in each country?

IS-LM model

- The interaction of the IS curve and the LM curve together determine:
 - the price level and the inflation rate.
 - the interest rate and the price level.
 - investment and the money supply.
 - the interest rate and the level of output.
- In the IS-LM model when government spending rises, in short-run equilibrium, in the usual case, the interest rate _____ and output _____.
 - rises; falls
 - rises; rises
 - falls; rises
 - falls; falls
- In the IS-LM model when taxation increases, in short-run equilibrium, in the usual case, the interest rate _____ and output _____.
 - rises; falls
 - rises; rises
 - falls; rises
 - falls; falls
- In the IS-LM model under the usual conditions in a closed economy, an increase in government spending increases the interest rate and crowds out:
 - prices.
 - investment.
 - the money supply.
 - taxes.
- Using the IS-LM analysis, if the LM curve is not horizontal, the multiplier for an increase in government spending is _____ for an increase in government purchases using the Keynesian-cross analysis.
 - larger than the multiplier
 - the same as the multiplier
 - smaller than the multiplier
 - sometimes larger and sometimes smaller than the multiplier

6. In the IS-LM analysis, the increase in income resulting from a tax cut is usually _____ the increase in income resulting from an equal rise in government spending.
- less than
 - greater than
 - equal to
 - sometimes less and sometimes greater than
7. In the IS-LM model when M/P rises, in short-run equilibrium, in the usual case, the interest rate _____ and output _____.
- rises; falls
 - rises; rises
 - falls; rises
 - falls; falls
8. If the demand for real money balances does not depend on the interest rate, then the LM curve:
- slopes up to the right.
 - slopes down to the right.
 - is horizontal.
 - is vertical.
9. If the Government passed a tax increase at the request of the president to reduce the budget deficit, but the Central Bank held the money supply constant, then the two policies together would generally lead to _____ income and a _____ interest rate.
- lower; lower
 - lower; higher
 - no change in; lower
 - no change in; higher
10. An increase in consumer saving for any given level of income will shift the:
- LM curve upward and to the left.
 - LM curve downward and to the right.
 - IS curve downward and to the left.
 - IS curve upward and to the right.
11. In the IS-LM model, a decrease in output would be the result of a(n):
- decrease in taxes.
 - increase in the money supply.
 - decrease in money demand.
 - increase in government purchases.
12. The policy response to economic slowdown is to increase money growth. This policy response can be represented in the IS-LM model by shifting the _____ curve to the _____.
- LM; right
 - LM; left
 - IS; right
 - IS; left
13. When the Central Bank seeks to increase interest rates, it _____ bonds, which shifts the _____ curve to the left.
- buy; IS
 - buy; LM

- c. sell; IS
- d. sell; LM

14. An economic change that does not shift the aggregate demand curve is a change in:

- a. the money supply.
- b. the investment function.
- c. the price level.
- d. taxes.

15. A shift in the aggregate demand curve, starting from long-run equilibrium, which increases output in the short run, will _____ in the long run, as compared to a short-run equilibrium.

- a. increase both output and the price level
- b. decrease output but increase prices
- c. increase output but decrease the price level
- d. decrease both output and the price level

16. The macroeconomic model may be completed by adding either the Keynesian assumption that _____ or the classical assumption that _____.

- a. output is fixed; prices are fixed
- b. prices are fixed; output is fixed
- c. the interest rate is fixed; the money supply is fixed
- d. prices are flexible; output varies

17. The spending hypothesis suggests that the Great Depression was caused by a:

- a. leftward shift in the IS curve.
- b. rightward shift in the IS curve.
- c. leftward shift in the LM curve.
- d. rightward shift in the LM curve.

18. The Great Depression in the United States:

- a. was likely caused by a fall in the money supply because it fell by 25 percent from 1929 to 1933.
- b. cannot be attributed to a fall in the money supply because the money supply did not fall.
- c. probably cannot be considered to have started because of a leftward shift in the LM curve because real balances did not fall between 1929 and 1931.
- d. probably was caused by a leftward shift in the LM curve because interest rates remained high between 1929 and 1933.

19. The debt-deflation theory of the Great Depression suggests that a(n) _____ deflation redistributes wealth in such a way as to _____ spending on goods and services.

- a. unexpected; reduce
- b. unexpected; increase
- c. expected; reduce
- d. expected; increase

20. One explanation for the impact of expected price changes on the level of output is that an increase in expected deflation _____ the nominal interest rate and _____ the real interest rate, so that investment spending declines.

- a. lowers; raises
- b. raises; lowers
- c. raises; raises
- d. lowers; lowers

21. Most economists believe:
- the Great Depression is very likely to be repeated.
 - it is likely that the money supply might again fall by one-fourth, but that fiscal policy would be expansionary enough in this case to avoid a Great Depression.
 - it is unlikely that the money supply might fall again by one-fourth, but it is likely that fiscal policy might be so contractionary as to cause a Great Depression.
 - in view of what economists now know about monetary and fiscal policy, and in view of institutional changes, a repeat of the Great Depression is unlikely.
22. If expected inflation equals 3 percent and monetary policy makers push the nominal interest rate to 1 percent, the real interest rate equals _____ percent.
- 4
 - 1
 - 0
 - 2
23. The slope of the IS curve depends on:
- the interest sensitivity of investment and the amount of government spending.
 - the interest sensitivity of investment and the marginal propensity to consume.
 - the interest sensitivity of investment and the tax rates.
 - tax rates and government spending.
24. Other things equal, a given change in government spending has a larger effect on demand the:
- flatter the LM curve.
 - steeper the LM curve.
 - smaller the interest sensitivity of money demand.
 - larger the income sensitivity of money demand.
25. If investment does not depend on the interest rate, then the _____ curve is _____.
- IS; vertical
 - IS; horizontal
 - LM; vertical
 - LM; horizontal

NUMERICAL PROBLEMS

1. An economy is described by the following equations:

Desired consumption

$$C_d = 130 + 0.5(Y - T) - 500r.$$

Desired investment

$$I_d = 100 - 500r.$$

Government purchases

$$G = 100.$$

Taxes

$$T = 100.$$

Real money demand

$$L = 0.5Y - 1000r.$$

Money supply

$$M = 1320.$$

Full-employment output $Y^* = 500$. Assume that expected inflation is zero so that money demand depends directly on the real interest rate.

a. Write the equations for the IS and LM curves. (These equations express the relationship between r and Y when the goods and asset markets, respectively, are in equilibrium.)

b. Calculate the full-employment values of output, the real interest rate, the price level, consumption, and investment.

c. Suppose that, because of investor optimism about the future marginal product of capital, the investment function becomes $I_d = 200 - 500r$. Assuming that the economy was initially at full employment, what are the new values of output, the real interest rate, the price level, consumption, and investment in the short run? In the long run? Show your results graphically.

2. Consider the following Keynesian closed economy:

$$\text{Consumption } C = 388 + 0.4(Y - T) - 600r.$$

$$\text{Investment } I = 352 - 400r.$$

$$\text{Government purchases } G = 280.$$

$$\text{Taxes } T = 300.$$

$$\text{Full-employment output } Y^* = 1400.$$

$$\text{Nominal money supply } M = 12,600.$$

$$\text{Real money demand } L = 1750 + 0.75Y$$

$$\text{Expected inflation } - 8750(r + 1Te). \quad 1Te = 0.02.$$

a. What is the equation of the IS curve?

b. Suppose that the price level is fixed at $P_{sr} = 7$ in the short run. What is the equation of the LM curve in the short run, while the price level remains fixed c. What are the short-run equilibrium values of output, the real interest rate, consumption, and investment?

d. What are the long-run equilibrium values of output, the real interest rate, consumption, investment, and the price level?

e. What is the value of velocity in long-run equilibrium?

f. Suppose that the government wants to increase its purchases to $G = 350$ and to achieve a long-run equilibrium with investment, I , equal to 320, and the price level, P , equal to 6. What level of taxes, T , and money supply, M , will achieve this long-run equilibrium?

$$3. \text{ Desired consumption and investment are } C_d = 4000 - 4000r + 0.20Y;$$

$$I_d = 2400 - 4000r.$$

As usual, Y is output and r is the real interest rate.

$$\text{Government purchases, } G, \text{ are } 2000.$$

a. Find an equation relating desired national saving, S_d , to r and Y .

b. What value of the real interest rate clears the goods market when $Y = 10000$? Use both forms of the goods market equilibrium condition. What value of the real interest rate clears the goods market when $Y = 10200$? Graph the IS curve.

c. Government purchases rise to 2400. How does this increase change the equation for national saving in Part (a)? What value of the real interest rate clears the goods market when $Y = 10,000$? Use both forms of the goods market equilibrium condition. How is the IS curve affected by the increase in G ?

4. Consider the following economy.

Desired consumption

$C_d = 325 + 0.5(Y - T)$ Desired investment Government purchases Taxes Real
money demand Money supply Full-employment output $500r$.

$I_d = 200 - 500r$.

$G = 150$.

$T = 150$.

$L = 0.5Y - 1000r$.

$M = 6000$.

$y = 1000$.

a. Calculate the full-employment values of the real interest rate, the price level, consumption, and investment.

b. Suppose that the price level is fixed at $P_{sr} = 15$.

What are the short-run equilibrium values of output and the real interest rate? With the price level still fixed at $P_{sr} = 15$, suppose that government purchases increase from $G = 150$ to $G = 250$. What are the new values of a_{15} and the short-run equilibrium level of output?

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