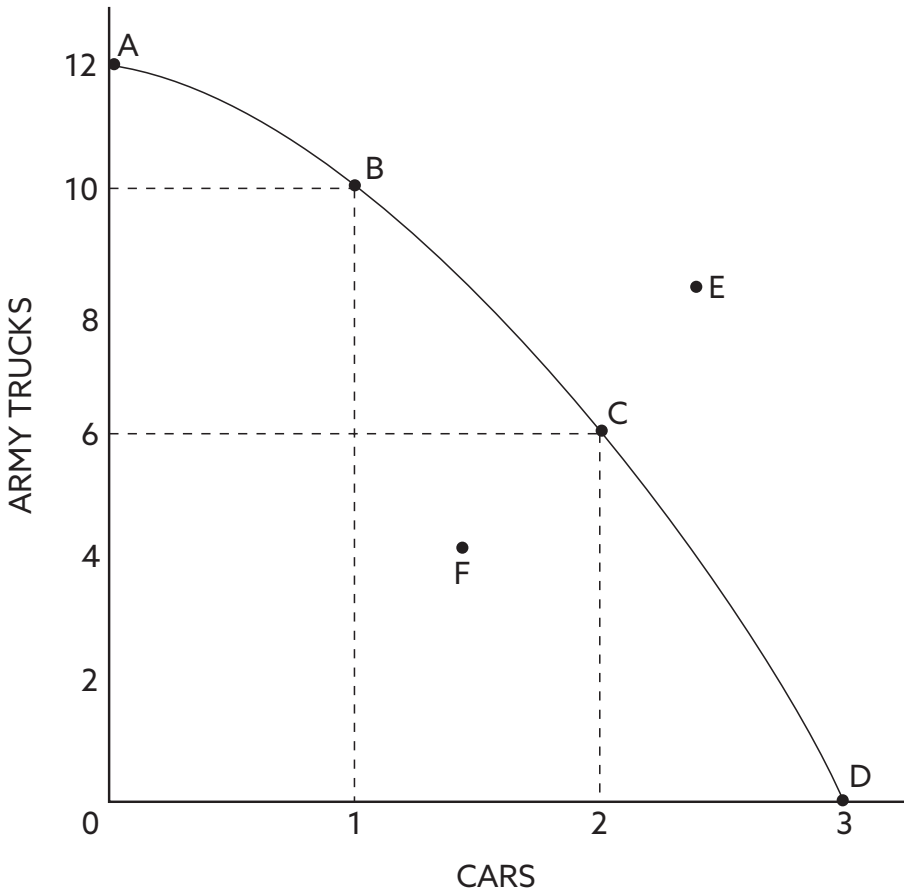
The Economic Way of Thinking

- Everything has a cost.
- People choose for good reasons.
- Incentives matter.
- People create economic systems to influence choices and incentives.
- People gain from voluntary trade.
- Economic thinking is marginal thinking.
- The value of a good or service is affected by people's choices.
- Economic actions create intended and unintended consequences.
- The test of a theory is its ability to predict correctly.

Production Possibilities Curve



1. What trade-offs are involved?
2. Why is the PPC concave, or bowed out, from the origin?
3. What does a point inside the PPC illustrate?
4. What is a historical example of a point inside the PPC?
5. What is the significance of a point outside the PPC?
6. Under what conditions can a point outside the PPC be reached?
7. What would a country's PPC look like if it did not have a scarcity of resources?

Absolute Advantage

- The ability to produce more of a good or service than some other producer, using the same amount of resources.

Comparative Advantage

- The ability to produce a good or service at a lower opportunity cost than another producer.

The Input Method

Input Method of Calculating Comparative Advantage

Uses data to calculate the amount of resources or INPUT that goes into producing a good.

PRODUCTIVITY DATA USING THE INPUT METHOD

	Time required to produce one radio	Time required to produce one bushel of wheat
Hakeem	20 minutes	5 minutes
Sita	30 minutes	15 minutes

OPPORTUNITY COST OF PRODUCING RADIOS AND WHEAT

	Opportunity cost of producing one radio	Opportunity cost of producing one bushel of wheat
Hakeem	$1\text{ radio} = \frac{20\text{ minutes}}{5\text{ minutes}} = 4\text{ bushels}$	$1\text{ wheat} = \frac{5\text{ minutes}}{20\text{ minutes}} = \frac{1}{4}\text{ radio}$
Sita	$1\text{ radio} = \frac{30\text{ minutes}}{15\text{ minutes}} = 2\text{ bushels}$	$1\text{ wheat} = \frac{15\text{ minutes}}{30\text{ minutes}} = \frac{1}{2}\text{ radio}$

The Output Method

Output Method of Calculating Comparative Advantage

Uses data to calculate the amount of the product or OUTPUT that can be produced with the same amount of resources.

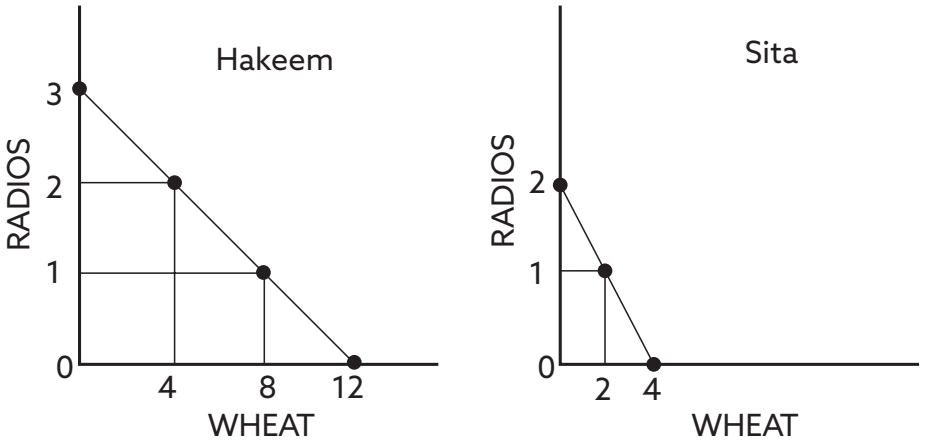
PRODUCTIVITY DATA USING THE OUTPUT METHOD

	Radios produced per hour	Wheat produced per hour
Hakeem	$\frac{60 \text{ minutes}}{20 \text{ minutes}} = 3$ radios	$\frac{60 \text{ minutes}}{5 \text{ minutes}} = 12$ bushels
Sita	$\frac{60 \text{ minutes}}{30 \text{ minutes}} = 2$ radios	$\frac{60 \text{ minutes}}{15 \text{ minutes}} = 4$ bushels

OPPORTUNITY COST OF PRODUCING RADIOS AND WHEAT

	Opportunity cost of producing one radio	Opportunity cost of producing one bushel of wheat
Hakeem	3 radios = 1 hour = 12 bushels 1 radio = 12/3 = 4 bushels	12 bushels = 1 hour = 3 radios 1 bushel = 3/12 = ¼ radio
Sita	2 radios = 1 hour = 4 bushels 1 radio = 4/2 = 2 bushels	4 bushels = 1 hour = 2 radios 1 bushel = 2/4 = ½ radio

PRODUCTION POSSIBILITIES CURVES FOR HAKEEM AND SITA



Determining Comparative Advantage (output method)

	Output per hour	
	One bushel of soybeans	One Pounds of beef
Argentina	20	5
Brazil	30	15

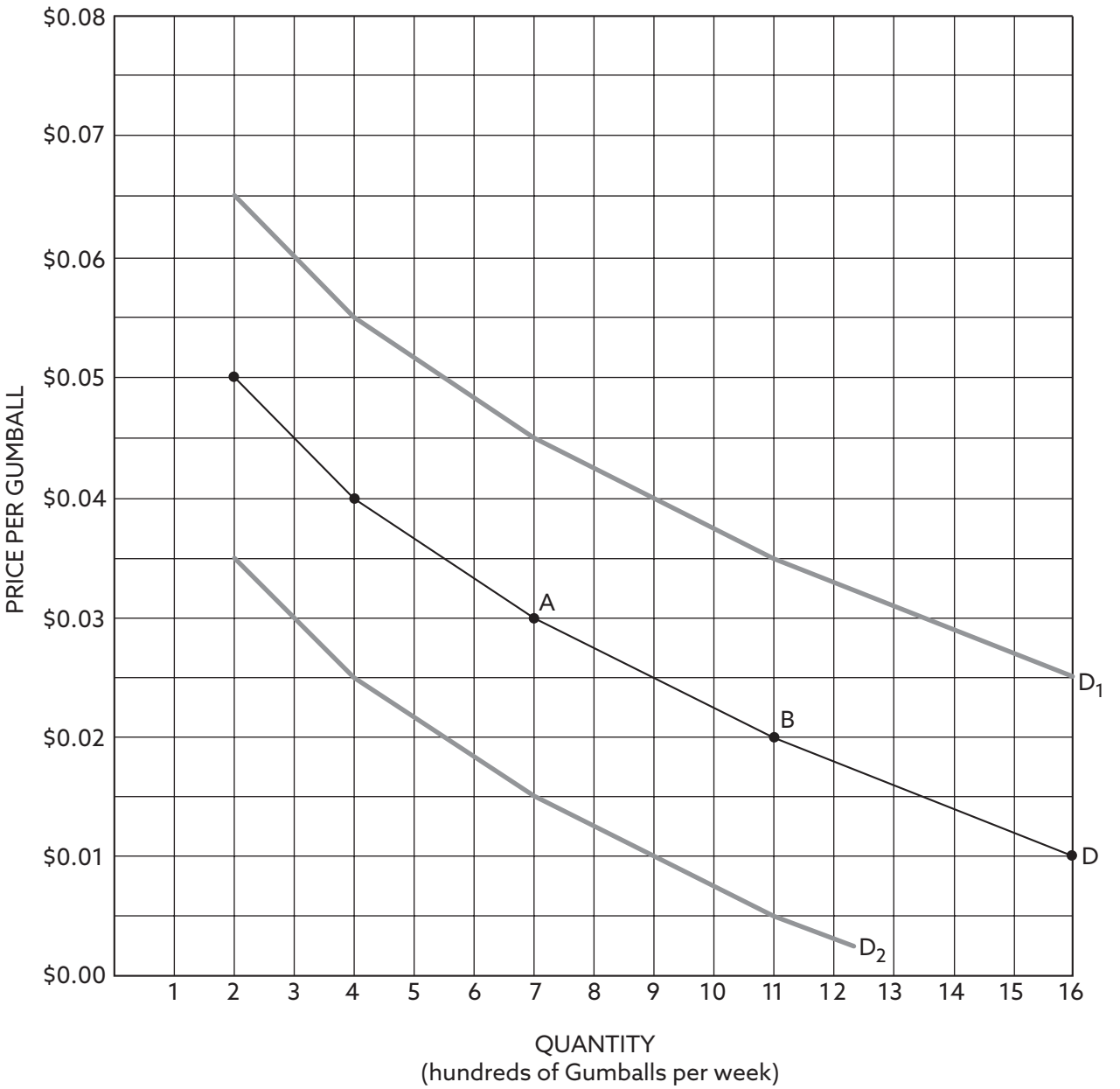
1. Which country has an absolute advantage in producing soybeans?
2. Which country has an absolute advantage in producing beef?
3. Which country has a comparative advantage in producing soybeans?
4. Which country has a comparative advantage in producing beef?
5. Which country should specialize in soybean production?
6. Which country should specialize in beef production?

Determining Comparative Advantage (input method)

	Time required for one unit	
	One bushel of soybeans	One pound of beef
Argentina	3 minutes	12 minutes
Brazil	2 minutes	4 minutes

1. Which country has an absolute advantage in producing soybeans?
2. Which country has an absolute advantage in producing beef?
3. Which country has a comparative advantage in producing soybeans?
4. Which country has a comparative advantage in producing beef?
5. Which country should specialize in soybean production?
6. Which country should specialize in beef production?

Illustrating the Difference between a Change in Demand and a Change in Quantity Demanded

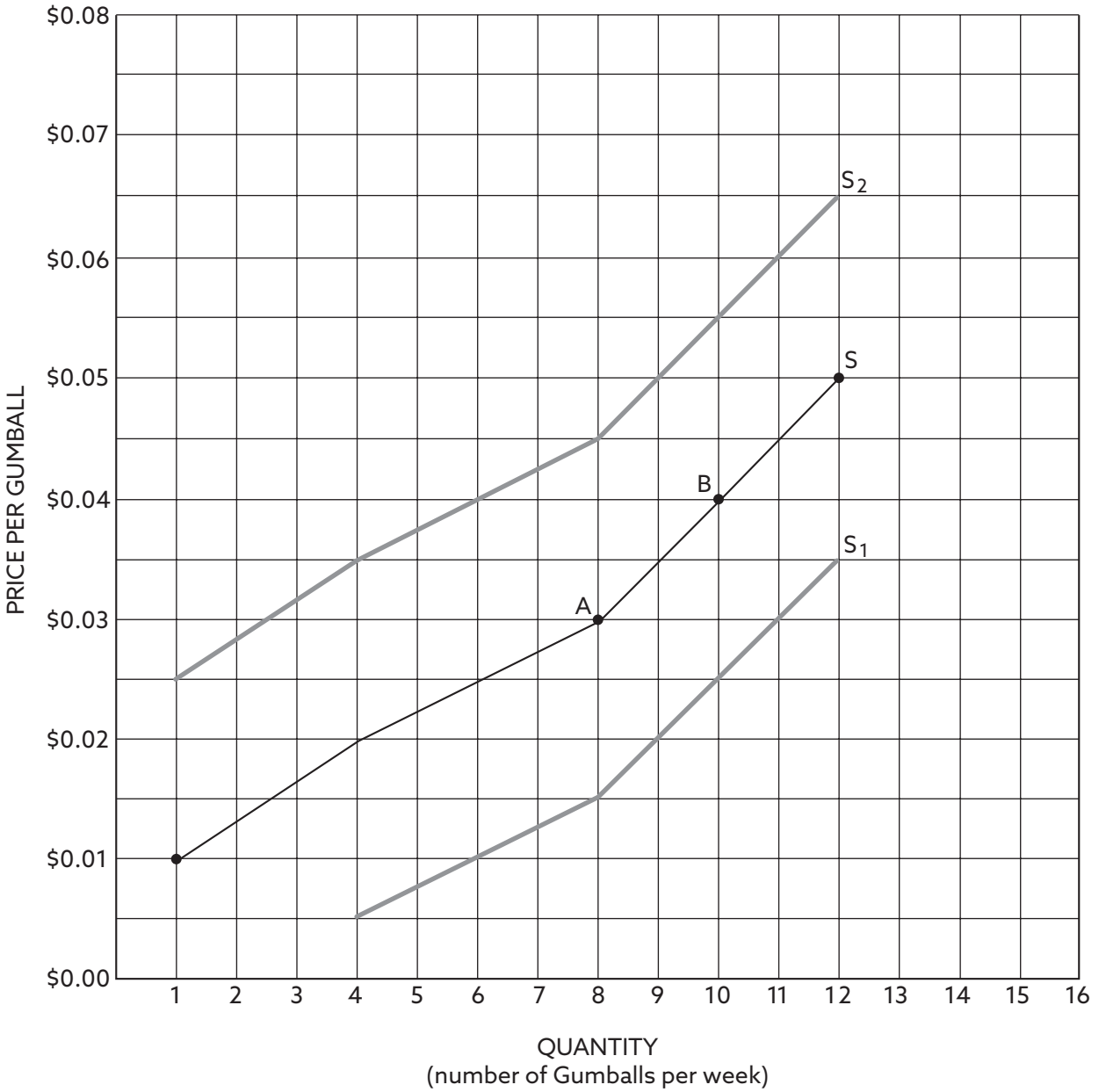


Determinants of Demand

Factors that Shift the Demand Curve

- Change in consumer tastes
- Change in the number of buyers
- Change in consumer incomes
- Change in the prices of complementary and substitute goods
- Change in consumer expectations

Illustrating the Difference between a Change in Supply and a Change in Quantity Supplied



Determinants of Supply

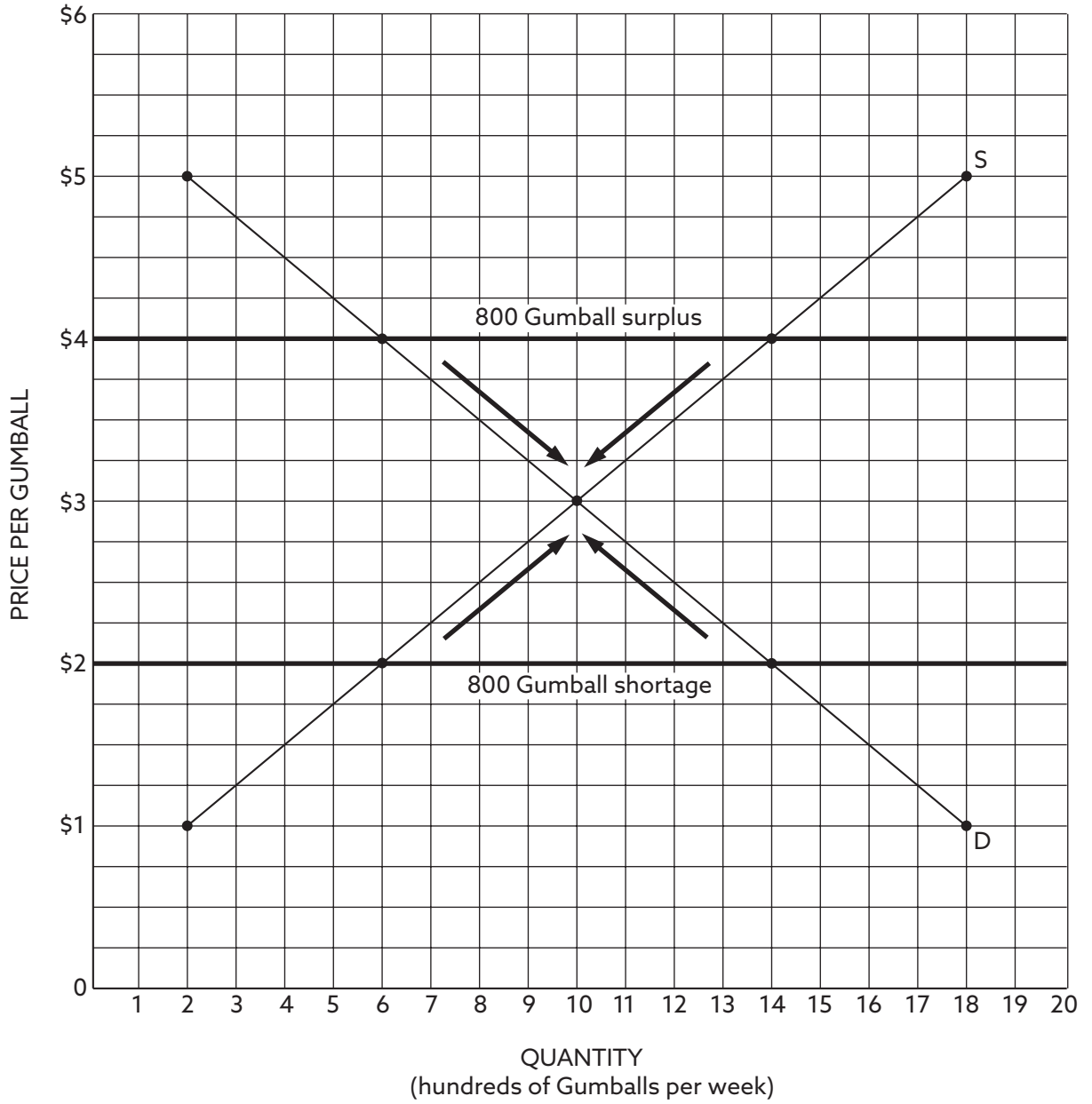
Factors that Shift the Supply Curve

- Change in resource prices or input prices
- Change in technology
- Change in taxes and subsidies
- Change in the prices of other goods
- Change in producer expectations
- Change in the number of suppliers

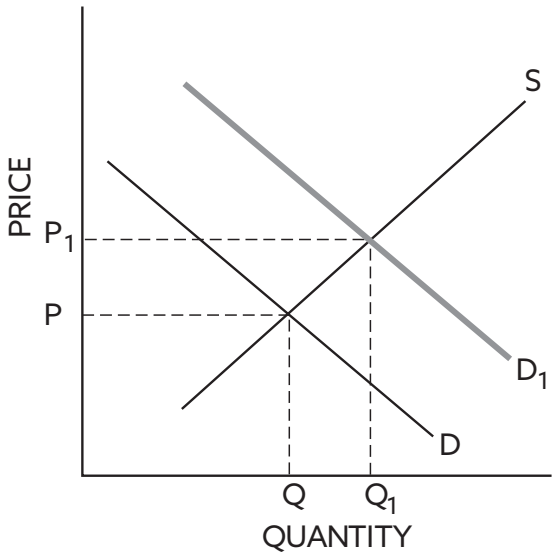
Any factor that *increases* the cost of production *decreases* supply.

Any factor that *decreases* the cost of production *increases* supply.

Equilibrium and Disequilibrium

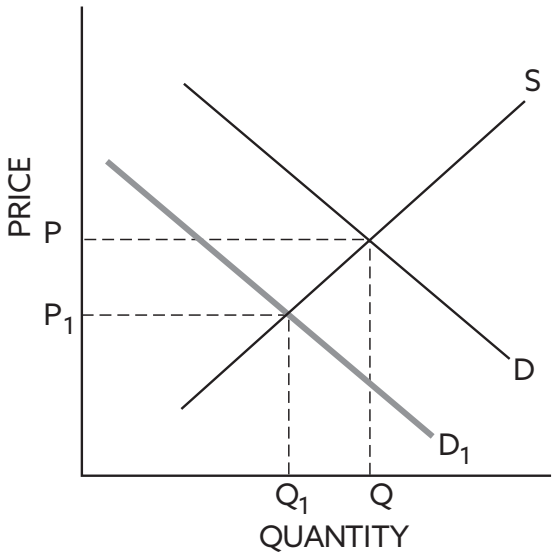


The Effects of Shifts in Demand or Supply



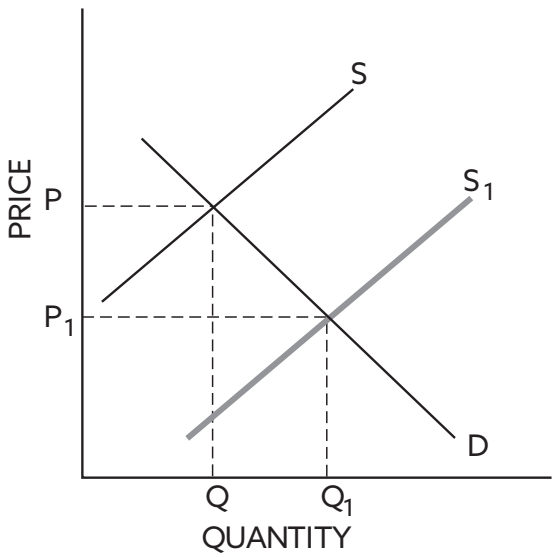
A. INCREASE IN DEMAND

D ↑
P ↑
Q ↑



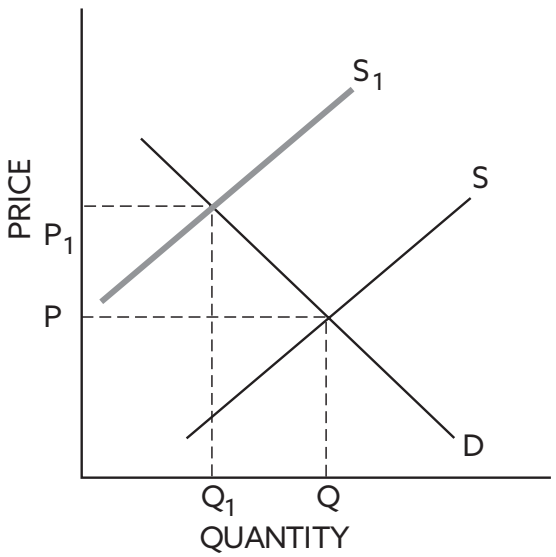
B. DECREASE IN DEMAND

D ↓
P ↓
Q ↓



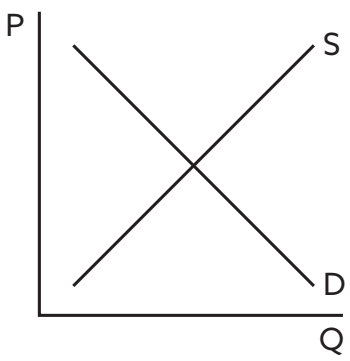
C. INCREASE IN SUPPLY

S ↑
P ↓
Q ↑



D. DECREASE IN SUPPLY

S ↓
P ↑
Q ↓

1


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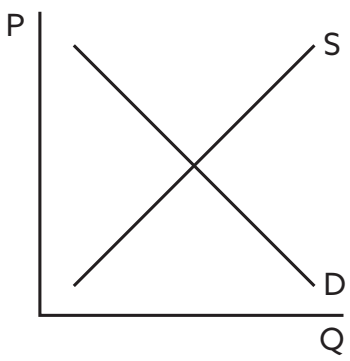

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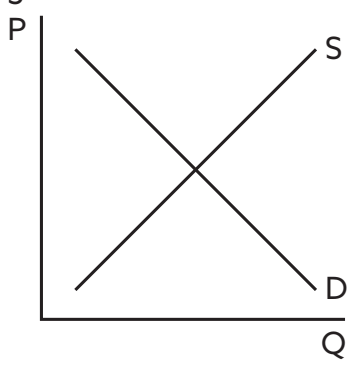

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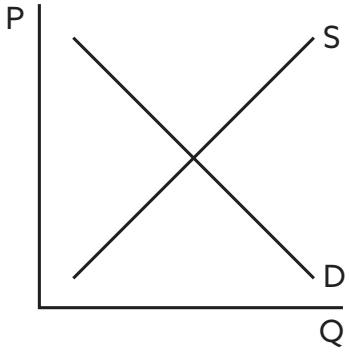

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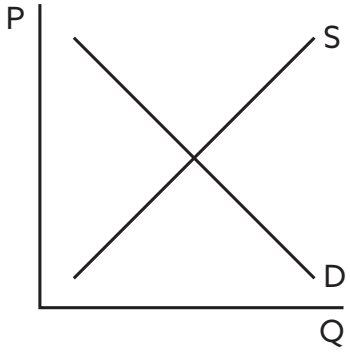

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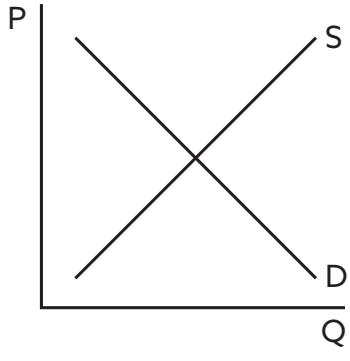

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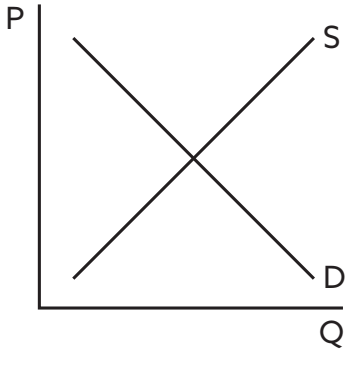

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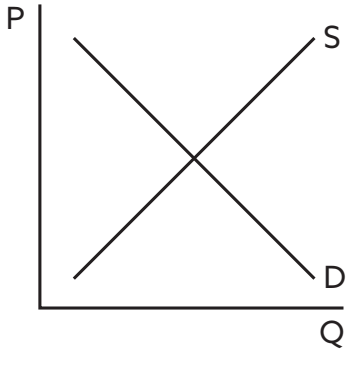

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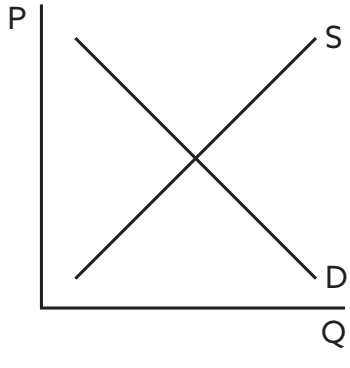
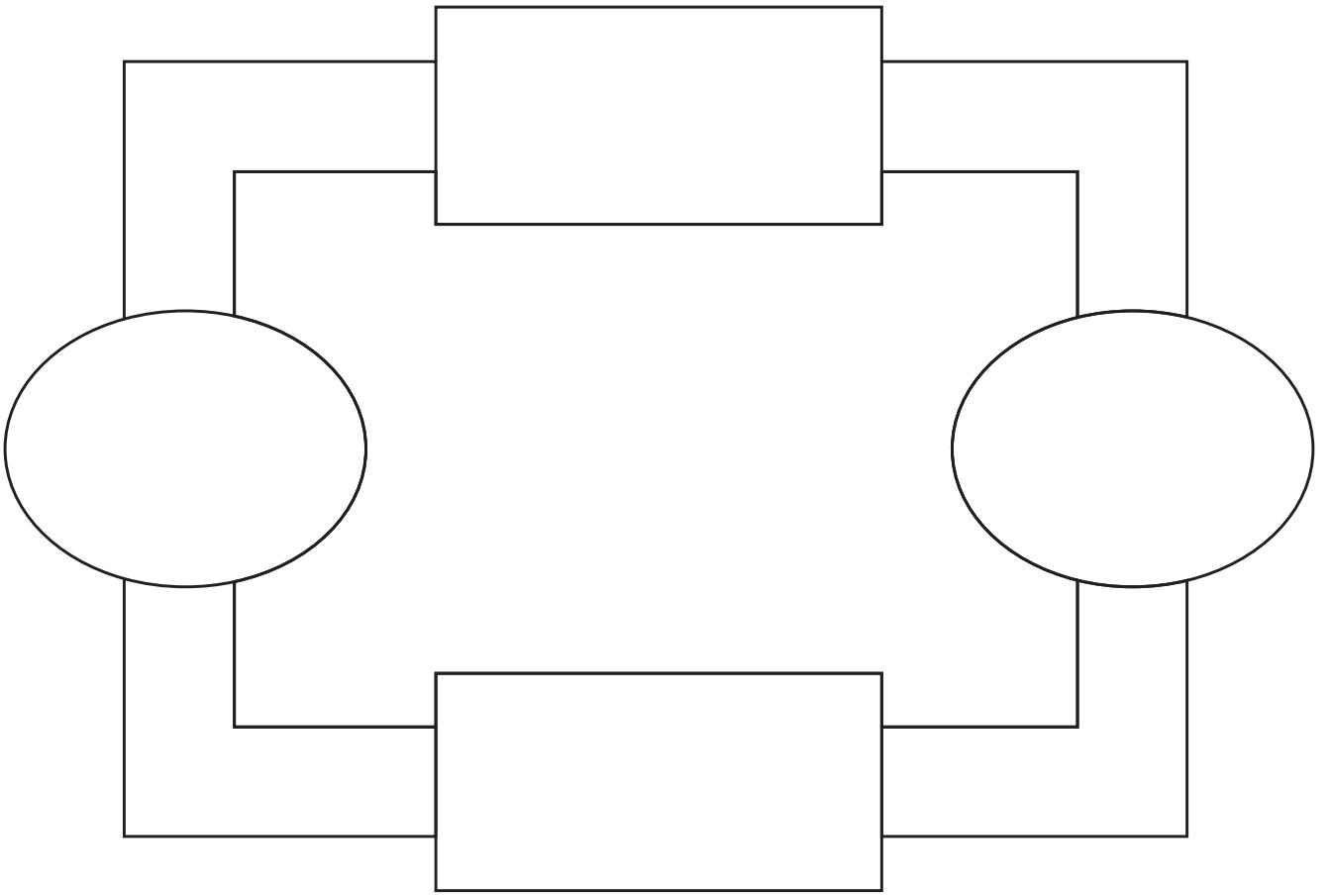


Introducing the Circular Flow



Injections and Leakage in the Circular Flow

Leakage – when money moves out of the Circular Flow

Households/Businesses don't spend **all** of their income.

- Savings
- Pay taxes
- Buy imports from other countries

Injection – when money is added to the circular flow

- Households/Businesses borrow money
- Government buys goods/services
- Sell exports to other countries

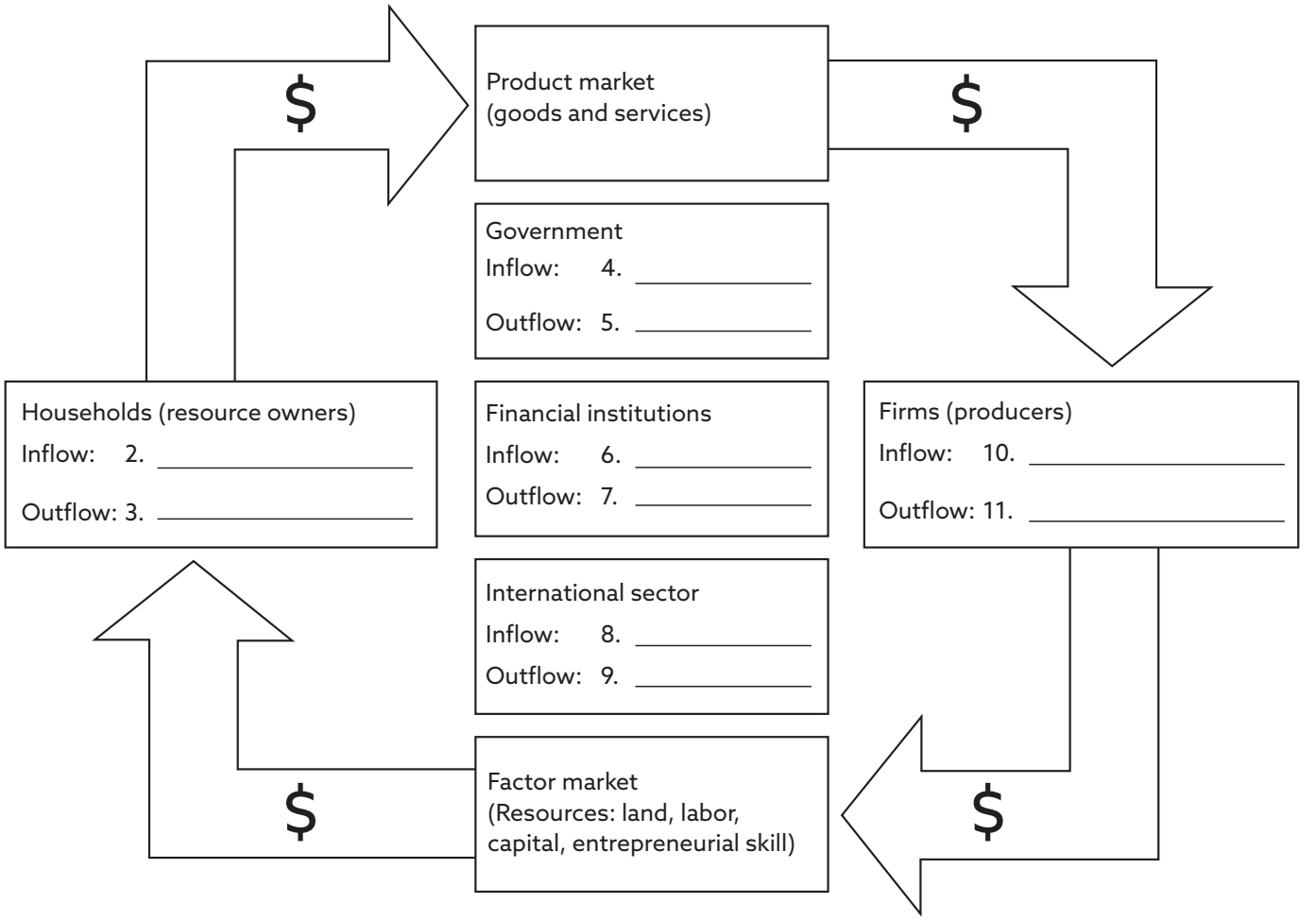
Injections are not from:

- Businesses selling goods/services
- Households selling resources

Circular Flow Diagram

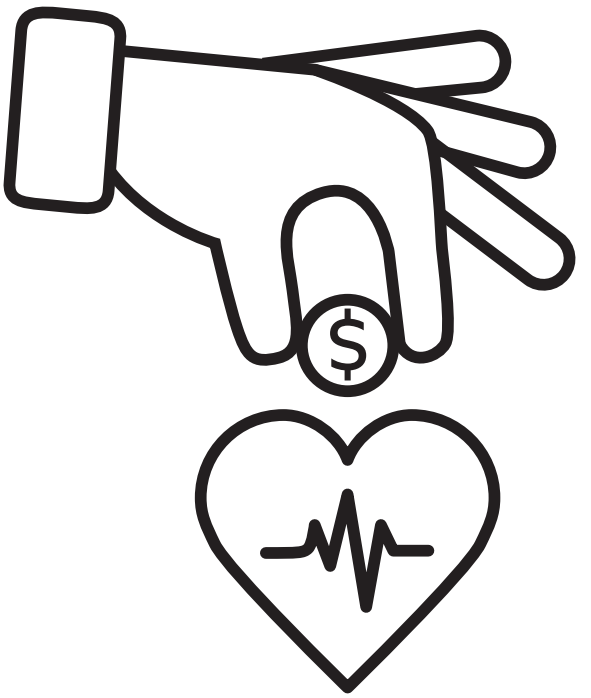
The Circular Flow of Resources, Goods, Services, and Money Payments

Money that flows out of the Circular Flow 1. _____



Money that flows into the Circular Flow 12. _____

GDP Measures the Health of the Economy



Gross Domestic Product is

- the total value
- of all final goods and services
- produced in a given year
- within the borders of a country.

Determining GDP Using the Expenditures Approach

Economists often measure GDP by totaling the money spent on four major categories of goods and services:
GDP = C+I+G+(X-M)

- **Consumption (C):** Spending by households on goods and services. Includes durable and non-durable goods.
- **Investment (I):** Spending by businesses on machinery, factories, equipment, tools, and construction of new buildings. Includes changes in inventory
- **Government (G):** Spending by all levels of government on goods and services.
- **Net Exports (X – M):** Spending by people abroad on U.S. goods and services (exports, or X) minus spending by people in the U.S. on foreign goods and services (imports, or M). Also written as X_N

Limitations of Expenditures Approach to Calculating GDP

What is Not Counted?

Produced But Not Counted

Illegal Goods
Any "black market" or illegal goods; the underground economy of services paid for in cash or "under the table".

Non-Market Transactions
Fixing your own car is a service, as is volunteering, but these are seen as occurring outside of any marketplace.

Intermediate Goods
Goods used in the production of other goods and services are not counted, so the steel used to produce a car would not count, only the value of the car itself.

No Production Taking Place

Used Goods
A used textbook or car would not count because it was already counted the year it was produced.

Financial Transactions
Purchases of stocks or other investments do not count because no good or service was produced.

Calculating GDP

Expenditures Approach

GDP=C+I+G+(X−M)

C = Consumer spending on goods and services

I = Investor spending on business capital goods

G = Government spending on public goods and services

X = exports

M = imports

Income Approach

Total Income (wages, rents, profits, interest)

- plus taxes on production and imports (indirect business taxes)
- plus consumption of fixed capital/depreciation
- minus net foreign factor income
- plus statistical discrepancies

Value Added Approach

The value of all final goods and services produced in the economy minus the value of intermediate goods and services used to produce the final goods.

Three Approaches for Calculating GDP

Econo Island produces tomatoes and tomato soup, but nothing else. Some of the tomatoes are consumed domestically, some are exported, and some are used to make soup. Some cans of soup are consumed domestically and some are exported. All ingredients for making soup are imported except for tomatoes. Labor is the only factor of production on Econo Island. The government of Econo Island purchases soup to supplement the public schools' lunch program.

Consider the following data:

Data from Tomato Factories	
Total labor hours worked:	200,000 hours
Tomato factory wage:	$6/hour
Total pounds of tomatoes sold:	240,000 lbs.
Price per pound of tomatoes:	$5 per lb.
Data from Soup Factories	
Total labor hours worked:	75,000 hours
Soup factory wage:	$12/hour
Total pounds of non-tomato ingredient inputs:	80,000 lbs.
Price of non-tomato ingredients:	$2.50/lb.
Total tomato inputs:	60,000 tomatoes
Total tomato soup sales:	140,000 cans
Price of soup per can:	$10/can
Data from Households	
Tomatoes consumed:	160,000 lbs.
Cans of soup consumed:	120,000 cans
Government Data	
Soup purchased by government:	10,000 cans of soup
Trade Data	
Soup exported:	10,000 cans
Tomatoes exported:	20,000 lbs. tomatoes
Ingredients imported:	80,000 lbs.

Measuring Inflation

A **Price Index** is a measure of the overall price level.

$$\text{Price Index} = \frac{\text{Current-year cost*}}{\text{Base year cost*}} \times 100$$

*Cost = cost of your market basket full of goods and services

The **Consumer Price Index** (CPI) is used to measure the change in prices over time (inflation or deflation).

$$\text{Rate of Inflation} = \frac{\text{Change in CPI}}{\text{Beginning CPI}} \times 100$$

Shortcomings of CPI

1 Substitution Bias

The CPI assumes that consumers continue to purchase the same basket of goods and services even as prices change.

2 Basket of Goods

CPI may not reflect the consumption patterns of all households. Households with different income levels or demographic characteristics may have different consumption patterns that are not fully captured by the CPI.

3 Quality Adjustments

CPI does not account for changes in quality. If a new smartphone is introduced with better features than the previous model, the CPI may not reflect the increase in value that consumers receive from the improved technology.

Inflation

Who is hurt?

- Lenders (banks)
- Savers
- Retired or on fixed income without a Cost-of-Living Adjustment (COLA)

Who is not hurt?

- Borrowers with fixed rate loans
- Businesses who raise prices quickly
- Government- gain more revenue from taxes and cheaper to pay back their debts.

Costs of Inflation

Shoe leather costs

- Increased transaction costs caused by inflation.

Menu costs

- The cost of changing a listed price.

Unit of account costs

- The cost of having a less reliable unit of measurement.

In and Out of the Labor Force

Population

IN the labor force

Employed

- Currently holds a full- or part-time job
- Includes those who are underemployed

Unemployed

- Not working but actively seeking work (sent out resumes, interviewed, etc.)
- Does not include discouraged workers

OUT of the labor force

- Children under age 16
- Retired
- Full-time student (not working)
- Choose not to work
- Want a job but not actively seeking work
- Stay-at-home parent
- Institutionalized
- Discouraged workers
- Active-duty military

Calculating Employment

The labor force participation rate (LFPR) – the percentage of the population that is considered part of the labor force.

$$\text{LFPR} = \frac{\text{labor force}}{\text{population}} \times 100.$$

The unemployment rate (UR) – the number of people who are unemployed as a percentage of the labor force. To be counted as unemployed you must be jobless, but actively looking for work (sent out resumes, interviewed, etc.) in the past four weeks.

$$\text{UR} = \frac{\text{number of unemployed}}{\text{labor force}} \times 100.$$

Types of Unemployment

Frictional Unemployment

- Someone "between jobs"
- Voluntarily left one job and looking for another
- Looking for your first job

Usually short term

Unavoidable in market economy

Good for the economy

Seasonal Unemployment

- often classified as a type of frictional unemployment – "adjusted seasonally"
- Demand for labor depends on the season – tourism, agricultural, construction, Christmas season
- Students in the summer → unemployment goes up because students move from "not in labor force" to looking for work

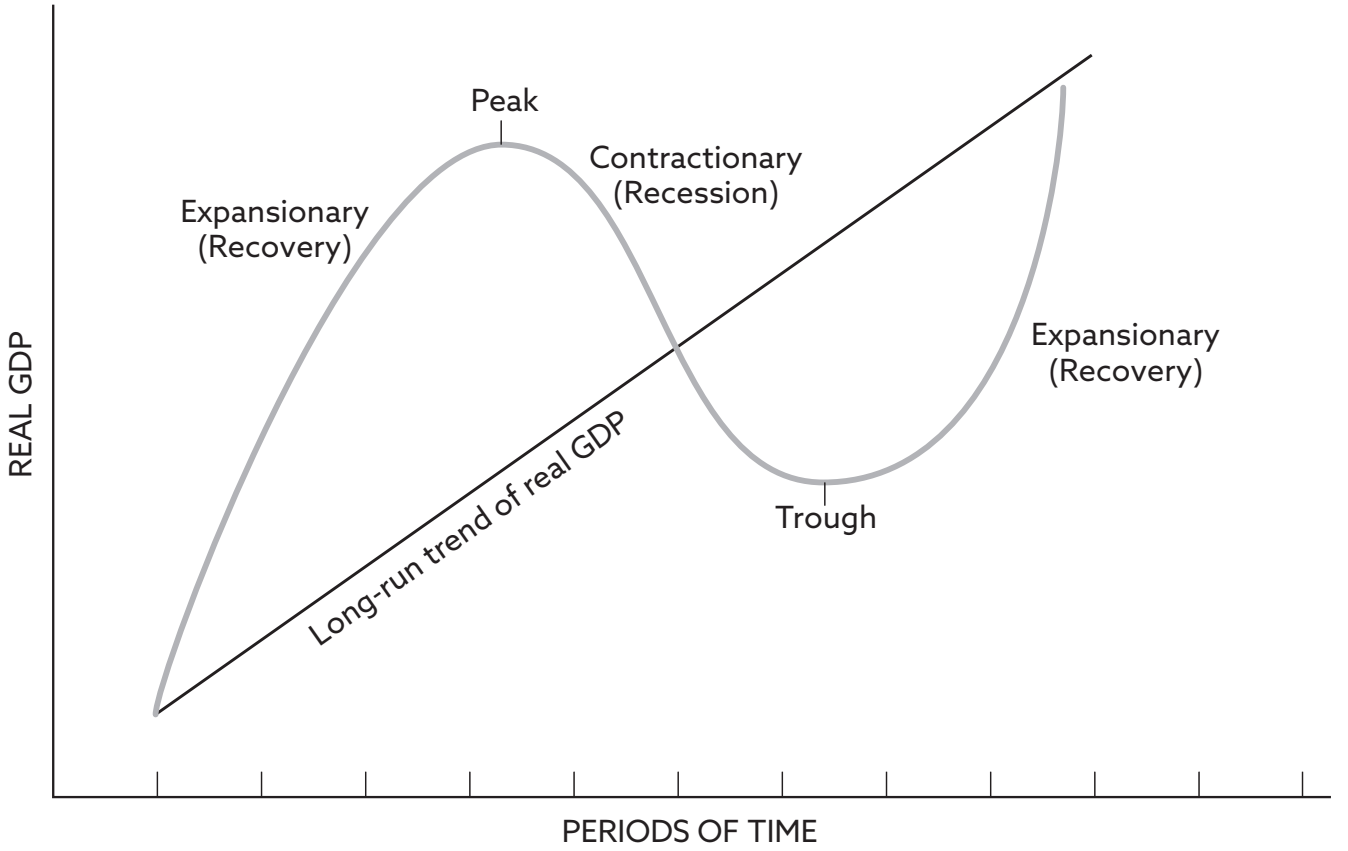
Structural Unemployment

- Advances in technology make jobs obsolete or reduce demand for certain skills
- Unemployed workers who don't have the skills that in-demand jobs require

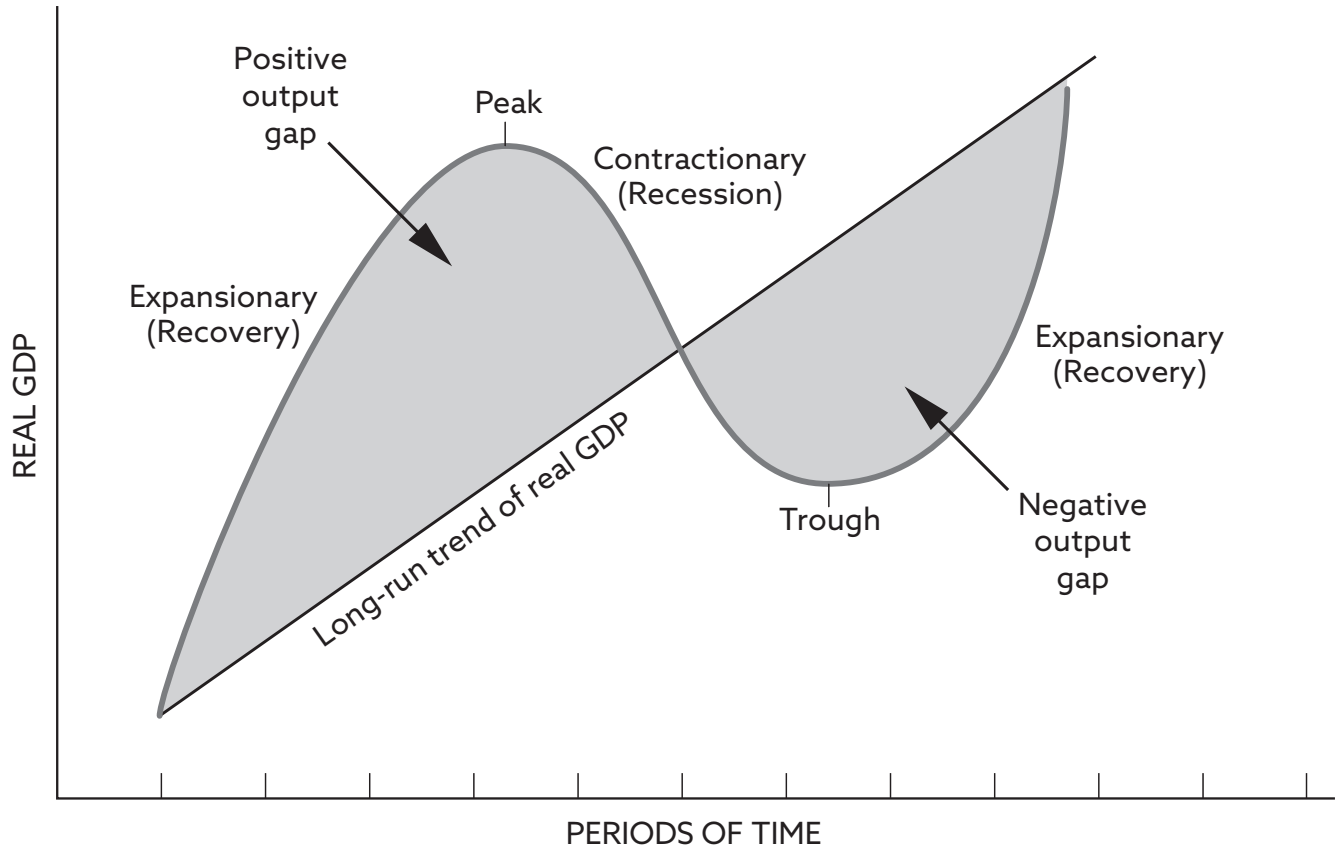
Cyclical Unemployment

- Due to a decline in business activity during an economic downturn or recession
- NOT due to changing jobs or lack of worker's skills

Phases of the Business Cycle

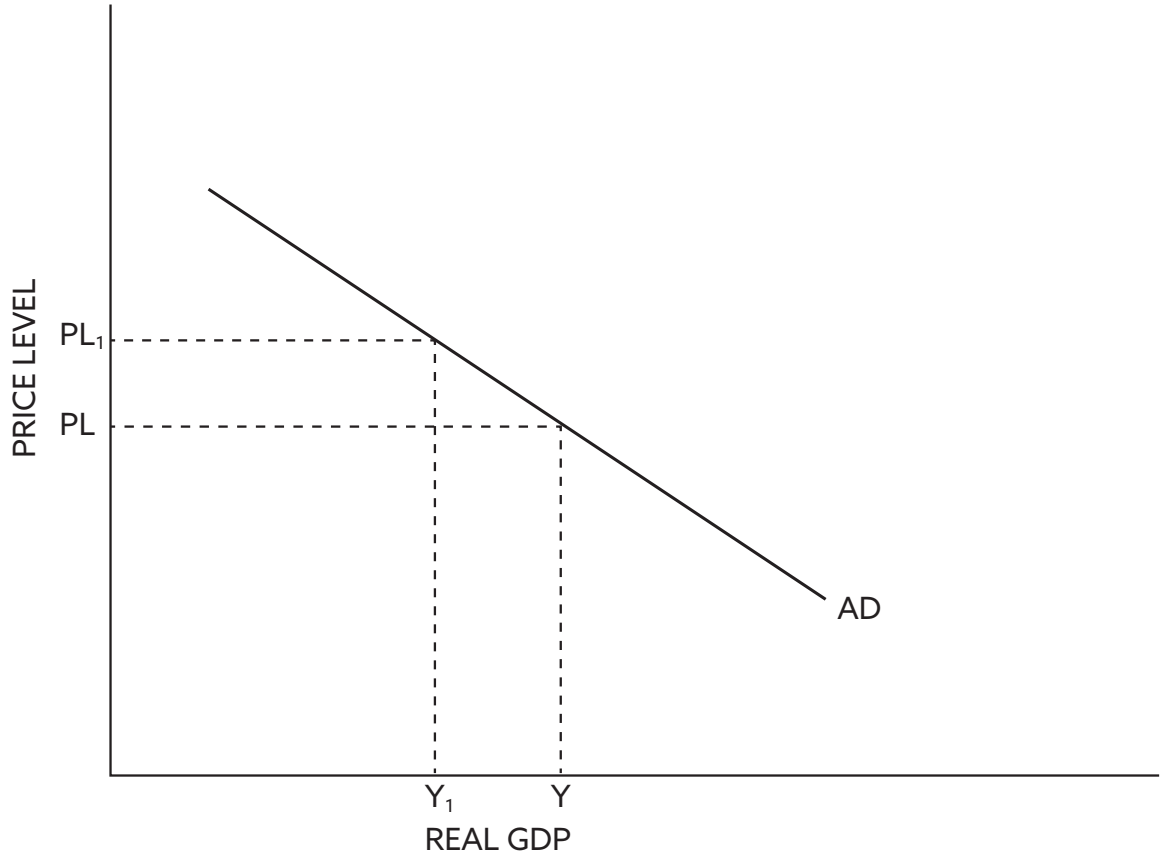


Output Gaps and the Business Cycle



Aggregate Demand

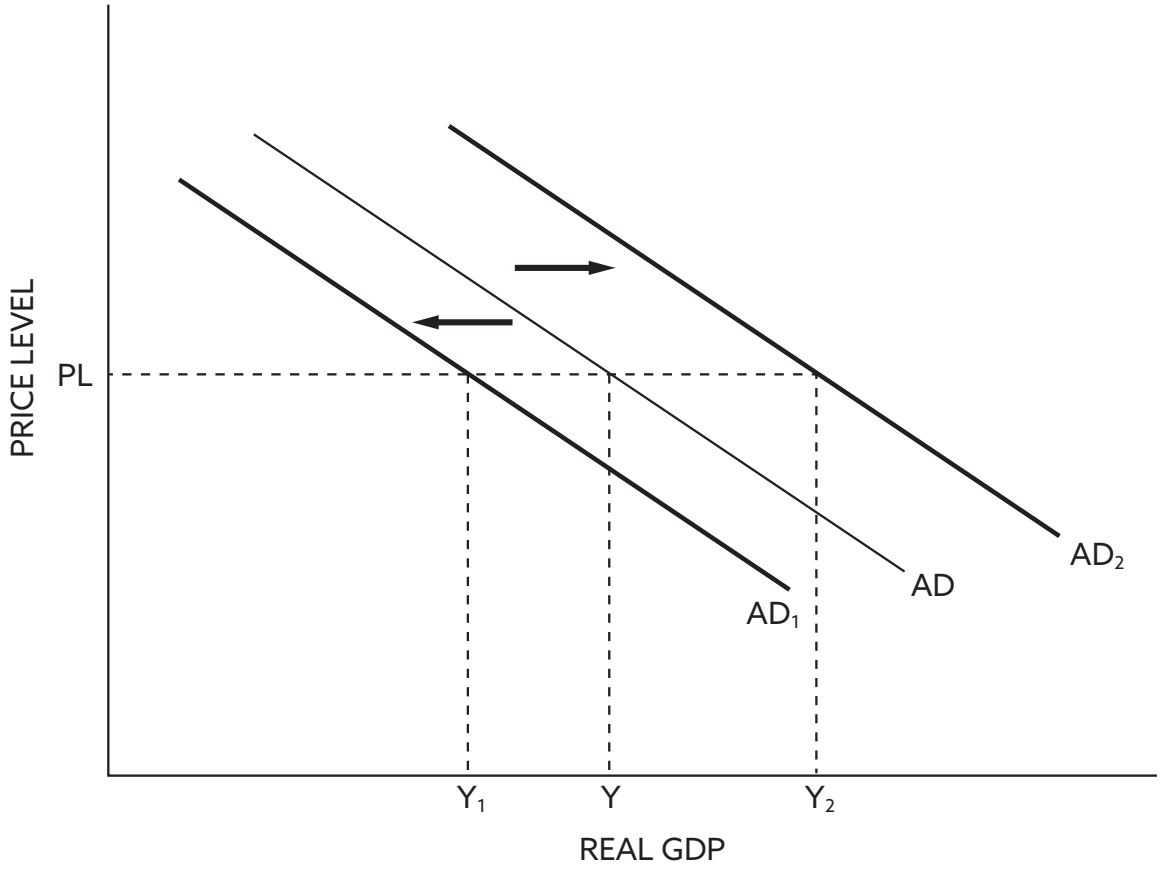
An increase in price from PL to PL_1 results in a decrease in real GDP from Y to Y_1



Movements along the curve are caused by

- Interest rate effect
- Real wealth effect
- Exchange rate effect

Shifts in Aggregate Demand



Reminder: AD = C+I+G+Xn

How do the following changes affect the AD curve?

- Increase in government spending
- Increase in income taxes
- Decrease in consumer expectations of future income
- Decrease in foreign income
- Increase in business' expectations of future sales

Determinants of Aggregate Demand

Change in Consumer Spending

- Consumer wealth
- Household borrowing
- Consumer expectations
- Personal taxes

Change in Investment Spending

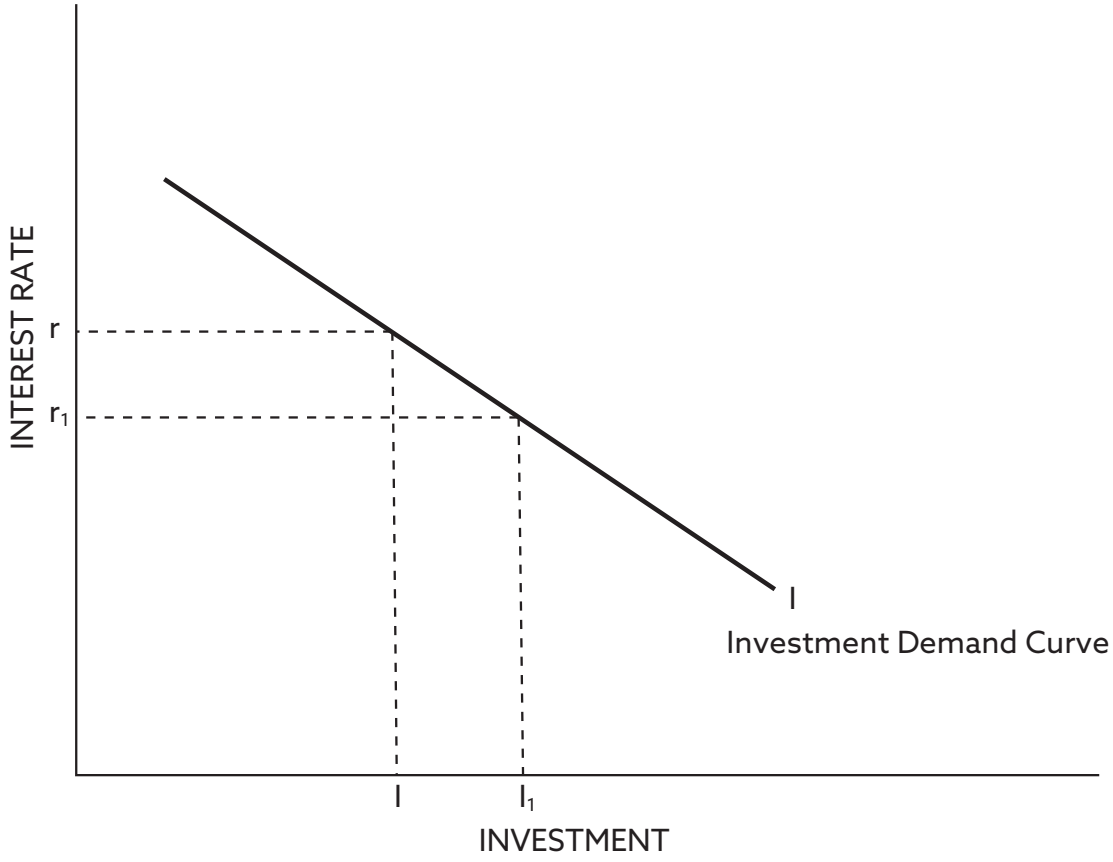
- Real Interest Rates
- Expected Returns
  - – Future expectations
  - – Technology
  - – Excess Capacity
- Business taxes

Change in Government Spending

Change in Net Export Spending

- National Income Abroad
- Exchange Rates

Investment Demand



An interest rate decrease from r to r_1 results in an investment increase from I to I_1.

Multiplier Equations

C+S = DI

Consumption + Spending = Disposable Income

MPC+MPS = 1

Marginal Propensity to Consume + Marginal Propensity to Save = 1

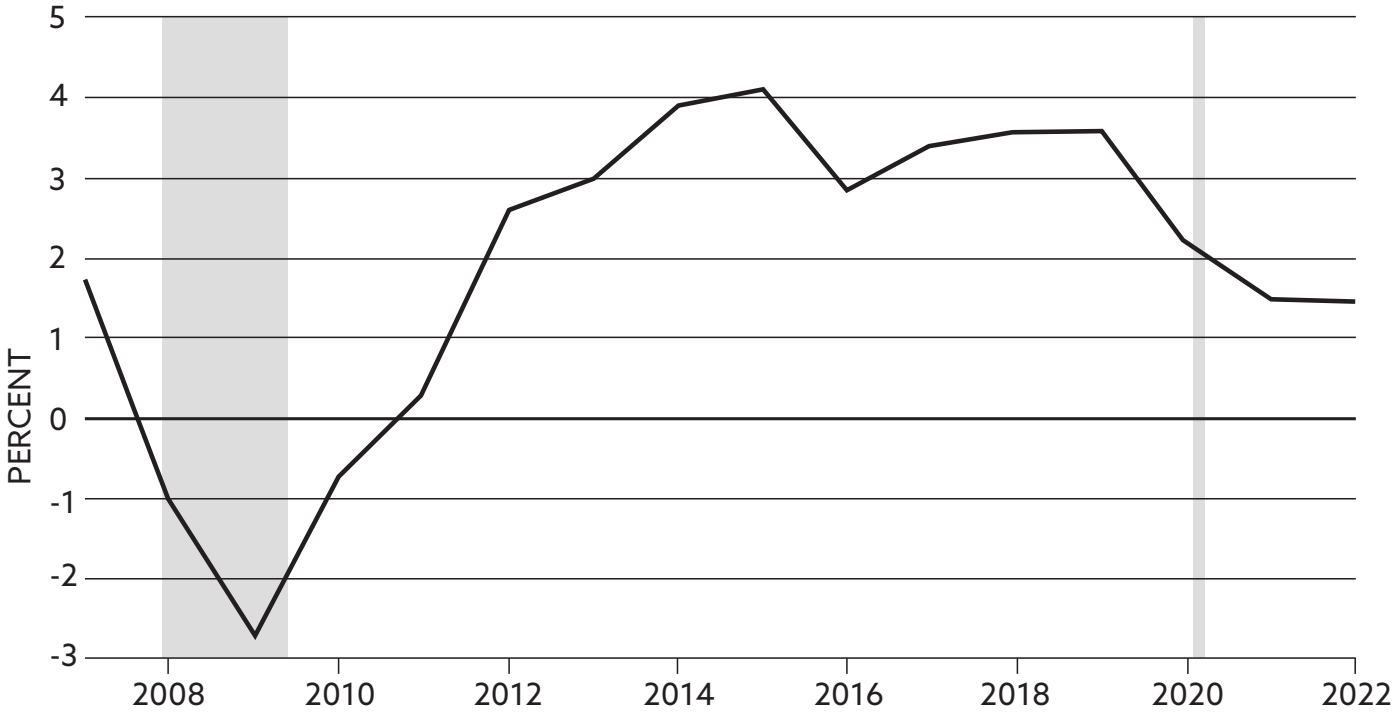
MPC = ΔC/ΔDI

Marginal Propensity to Consume =
Change in Consumption Divided By Change in Disposable Income

MPS = ΔS/ΔDI

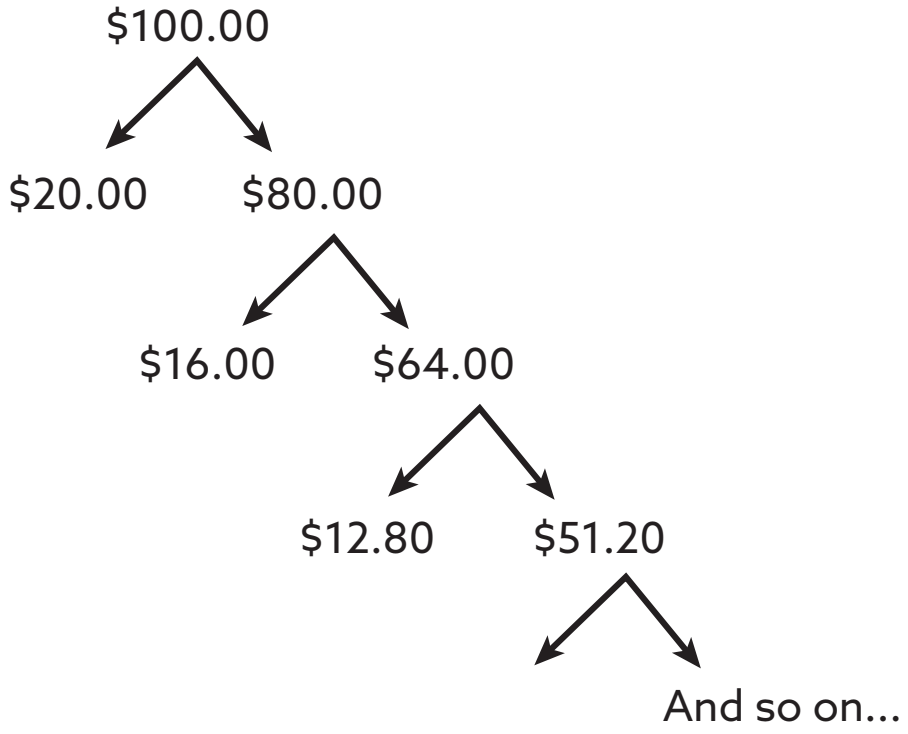
Marginal Propensity to Save =
Change in Saving Divided By Change in Disposable Income

Saving as a Percentage of Gross National Income



Source: U.S. Bureau of Economic Analysis

How Much Money is Created in the Economy?



Spending multiplier = 1/(1–MPC) or 1/MPS

The Spending Multiplier and the Tax Multiplier

Spending Multiplier = 1/(1-MPC) or 1/MPS

How to use the spending multiplier:

- Change in GDP = change in AD component x spending multiplier.

When to use the spending multiplier:

- When there is a change in a component of AD.

Tax Multiplier = –MPC/(1-MPC) or -MPC/MPS

How to use the tax multiplier:

- Change in GDP = change in taxes x tax multiplier.

When to use the tax multiplier:

- When there is a change in lump-sum taxes.

Note: Remember that the tax multiplier has a negative sign.

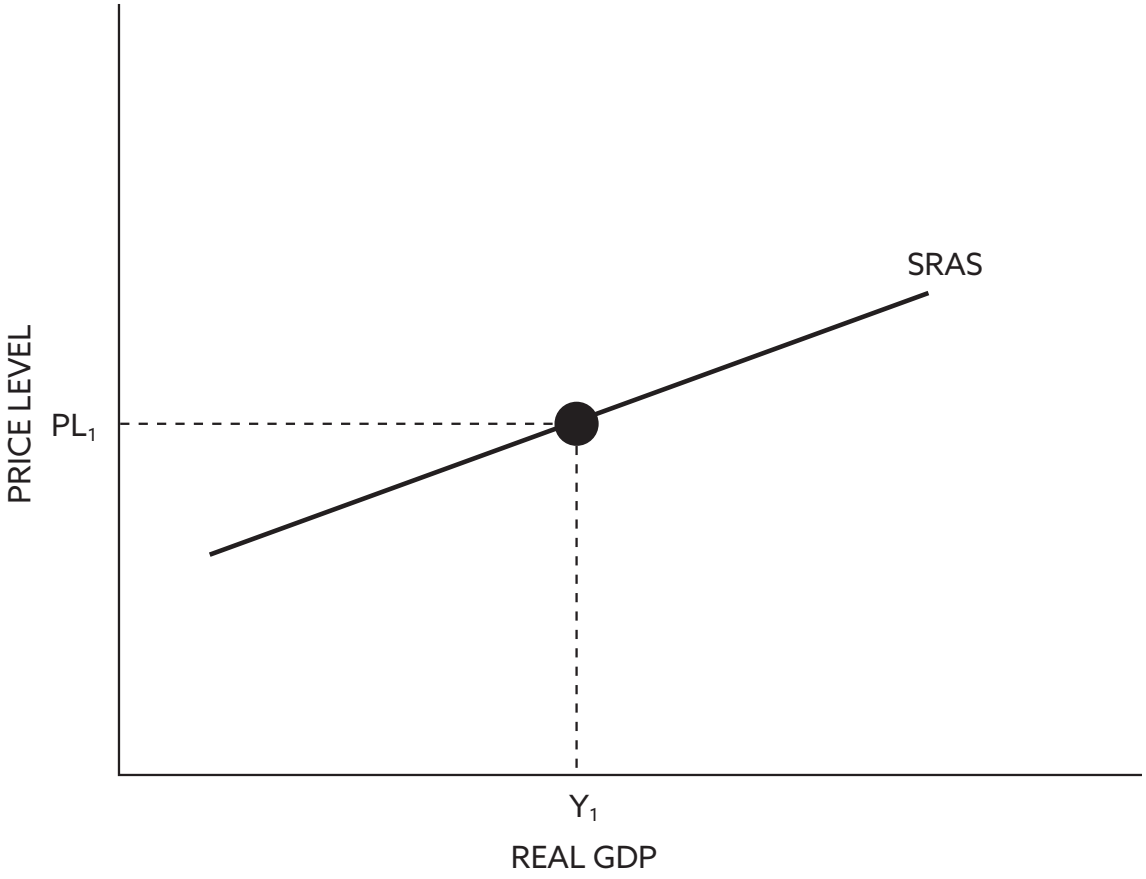
Increasing taxes → negative multiplier → decrease in spending

Increasing taxes (+$5 million) x (-3) = -$15 million in spending

Decreasing taxes → negative multiplier→ increase in spending

Decreasing taxes (-$5 million) x (-3) = +$15 million in spending

Short Run Aggregate Supply Curve



Determinants of Short Run Aggregate Supply

Changes in resource (input) prices

- Wages, machinery and equipment, commodity prices (oil)

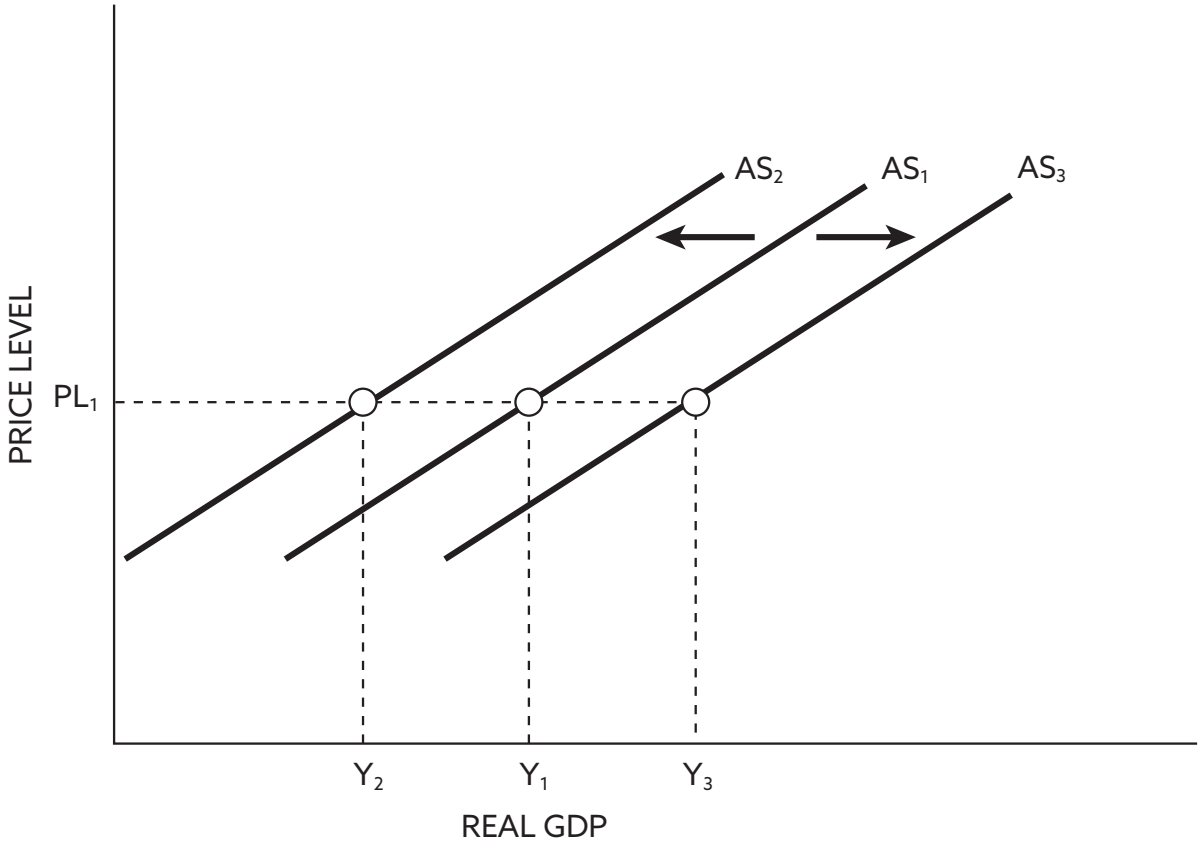
Changes in productivity

- Improved technology
- Better educated workforce

Changes in taxes and govt. regulations

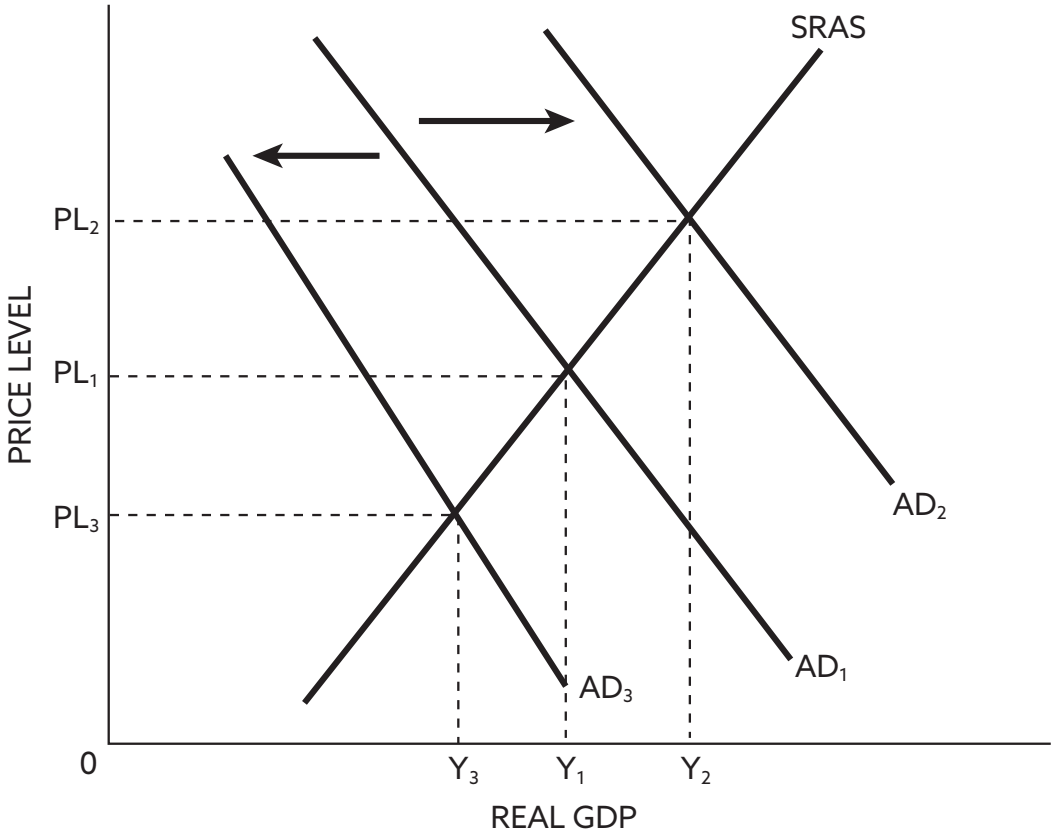
- Taxes on business – excise, payroll tax
- Subsidies – payment or tax break by the government to producers
- Regulations – safety and environmental laws, for example

Shifting Aggregate Supply

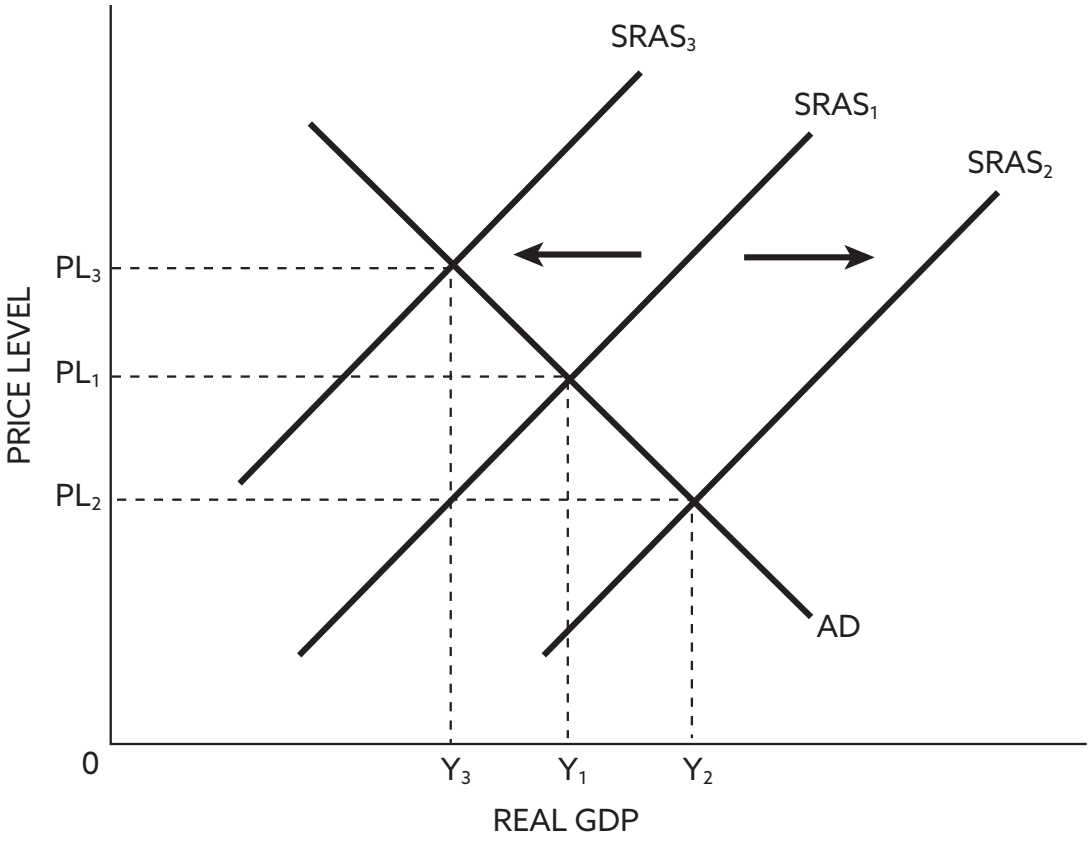


- Is it more expensive to produce? Shift the AS curve to the left.
- Is it less expensive to produce? Shift the AS curve to the right.

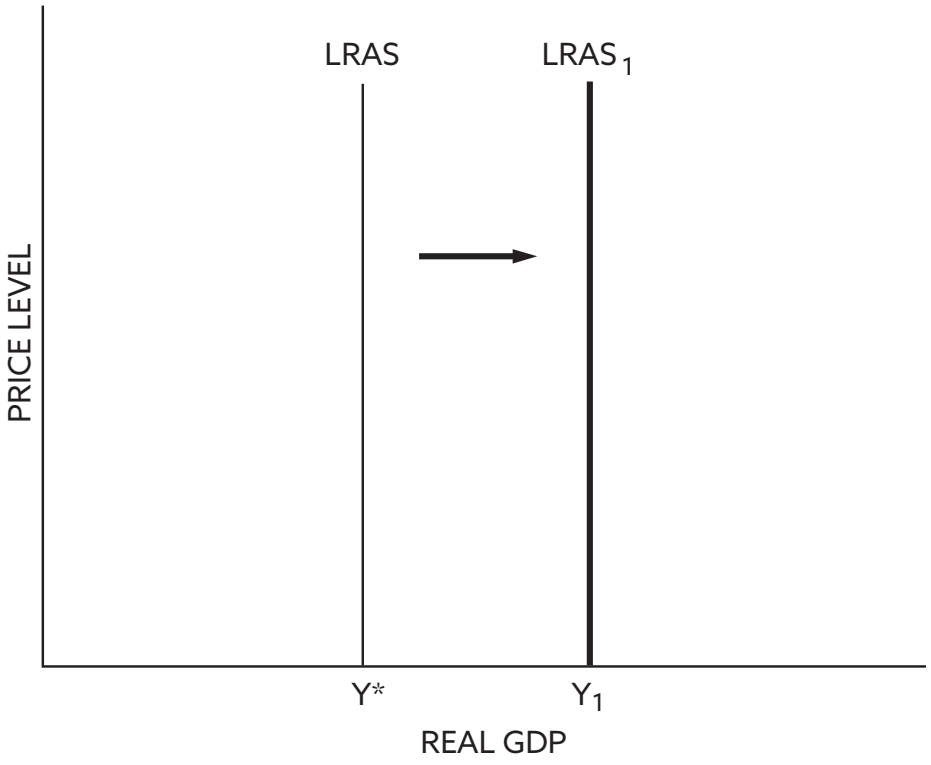
Change in Aggregate Demand



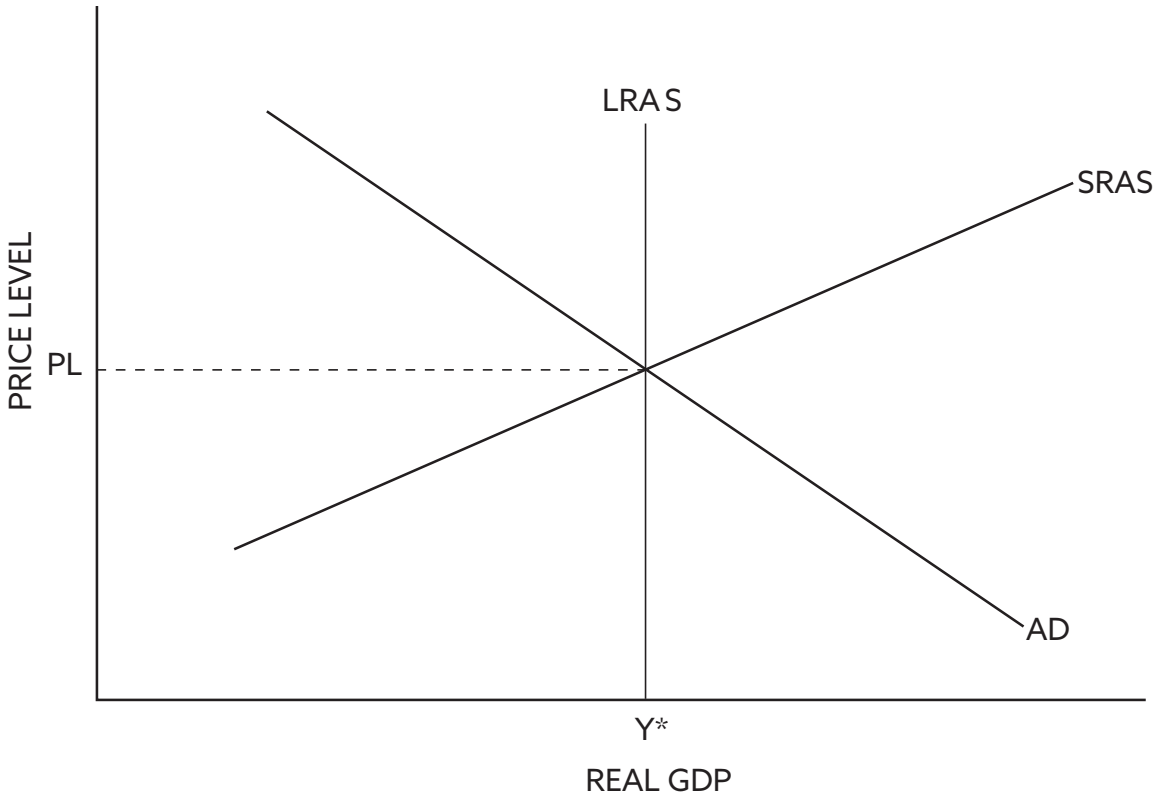
Change in Short Run Aggregate Supply



Long-Run Aggregate Supply

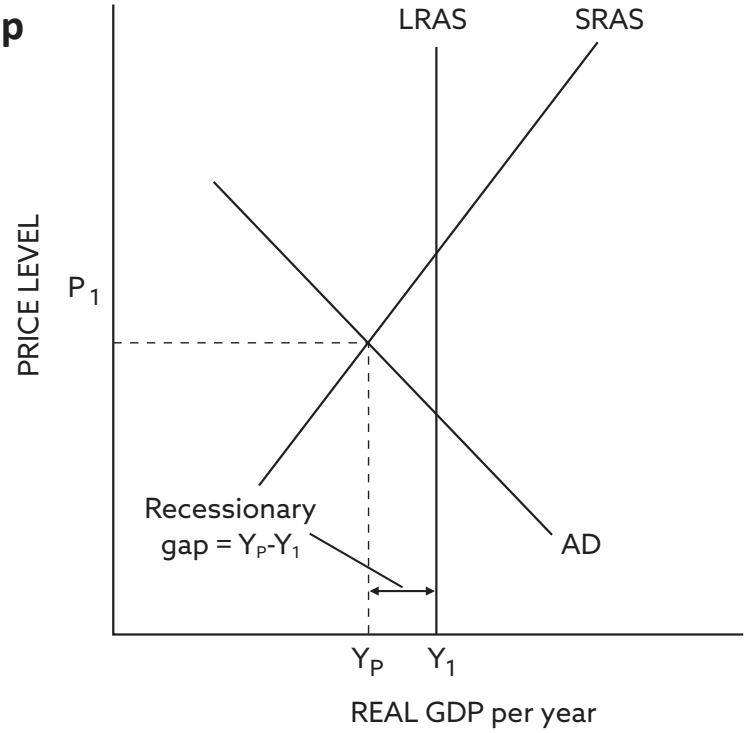


Long-Run Equilibrium

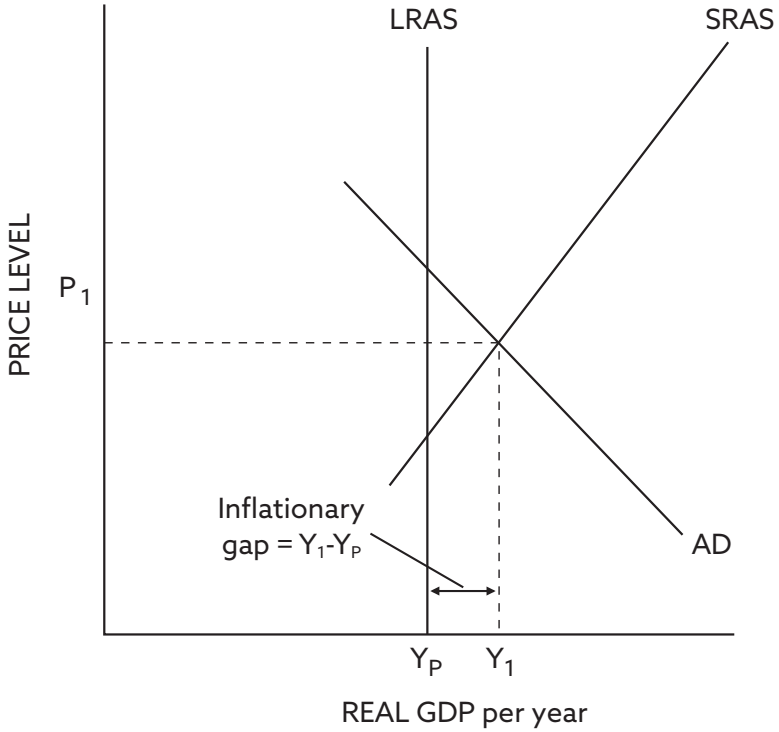


Recessionary and Inflationary Gaps

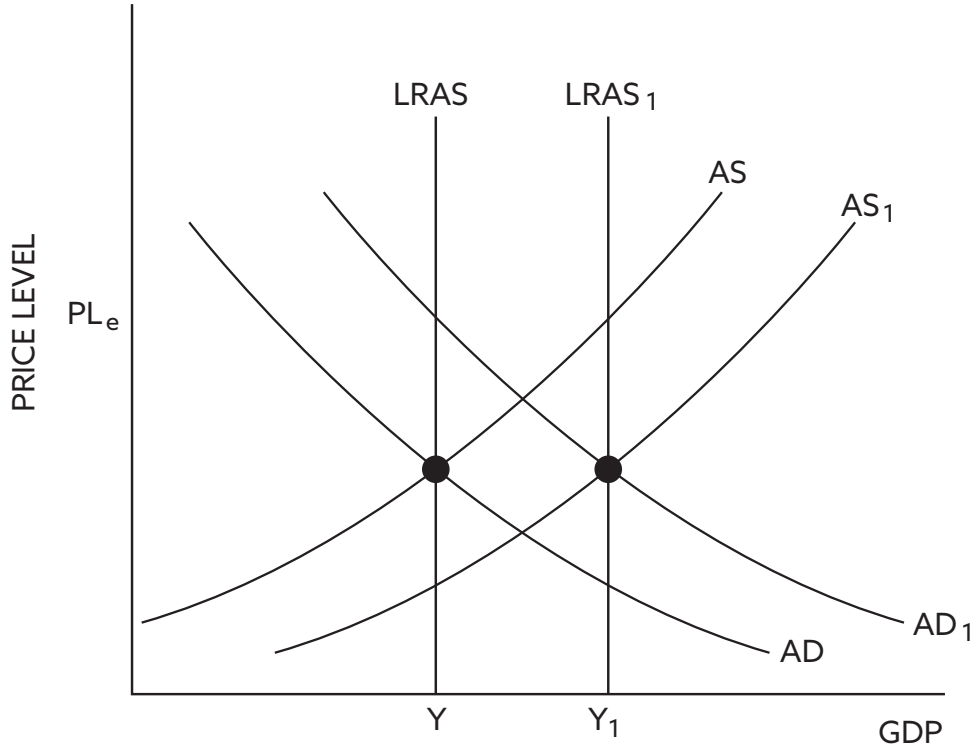
Recessionary Gap



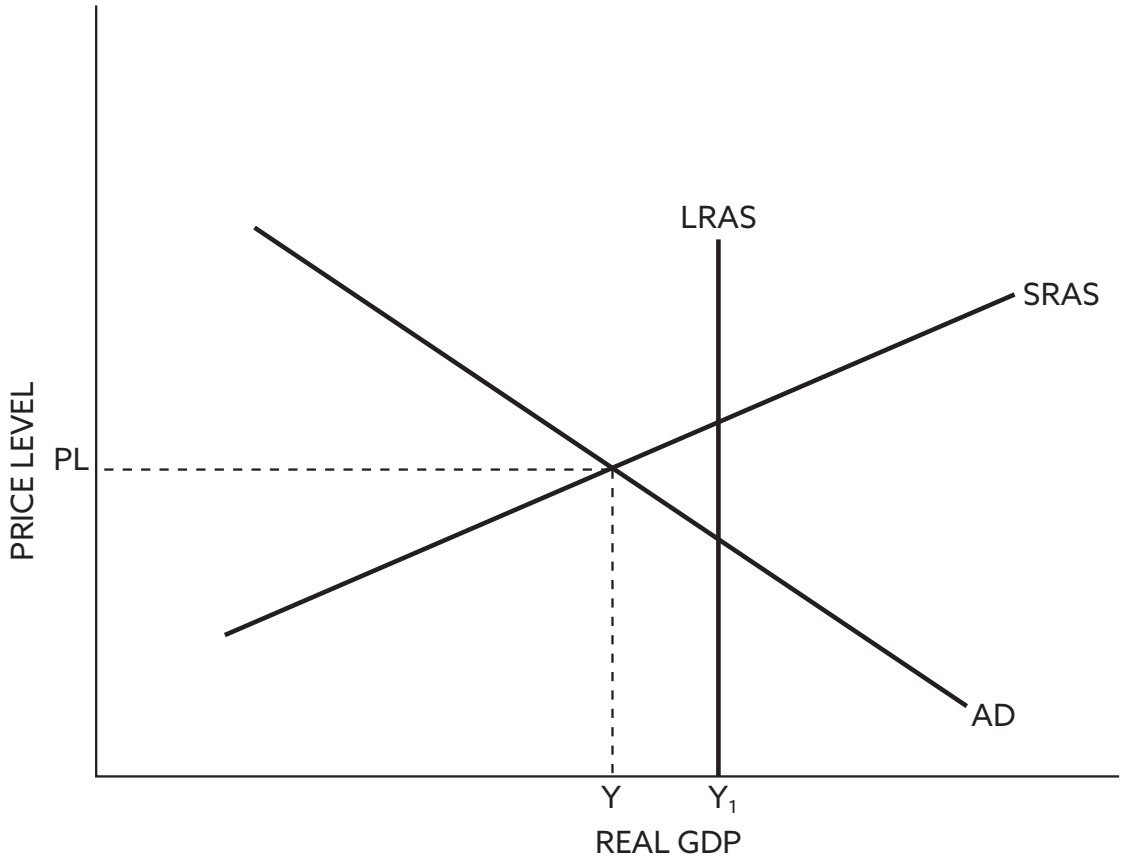
Inflationary Gap



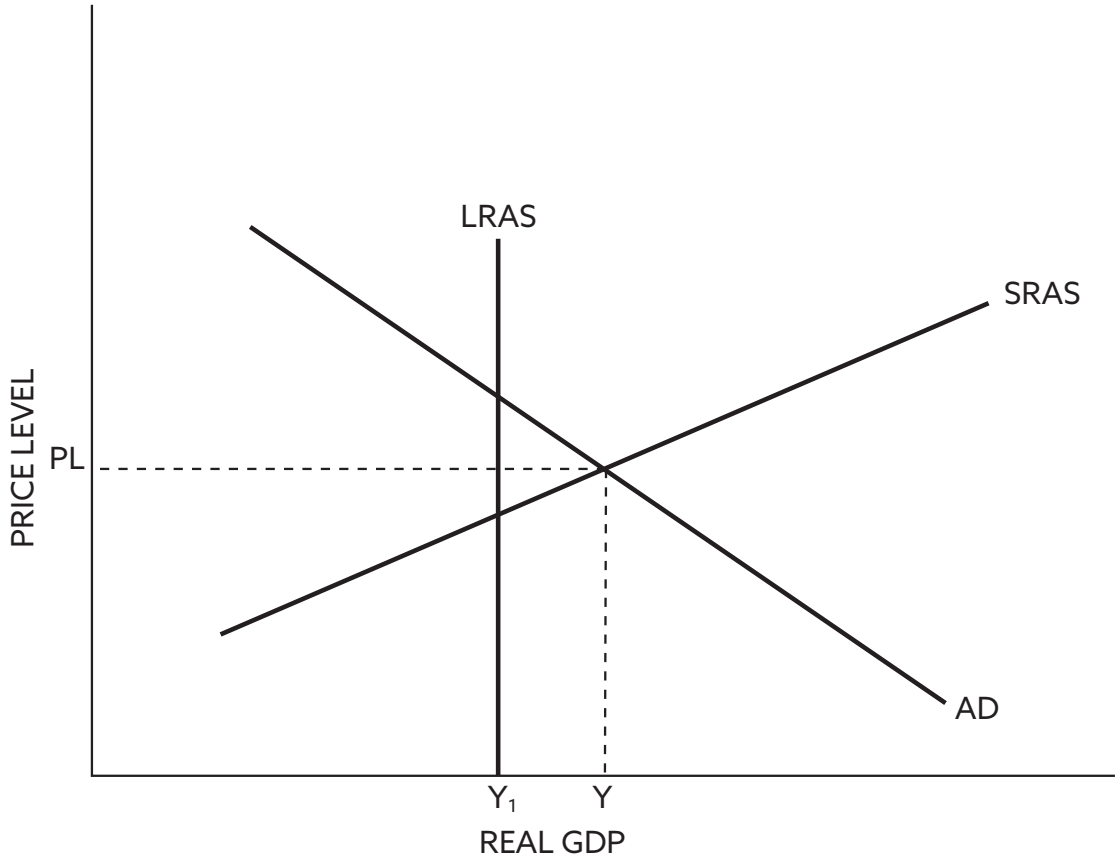
Long-Run Shifting



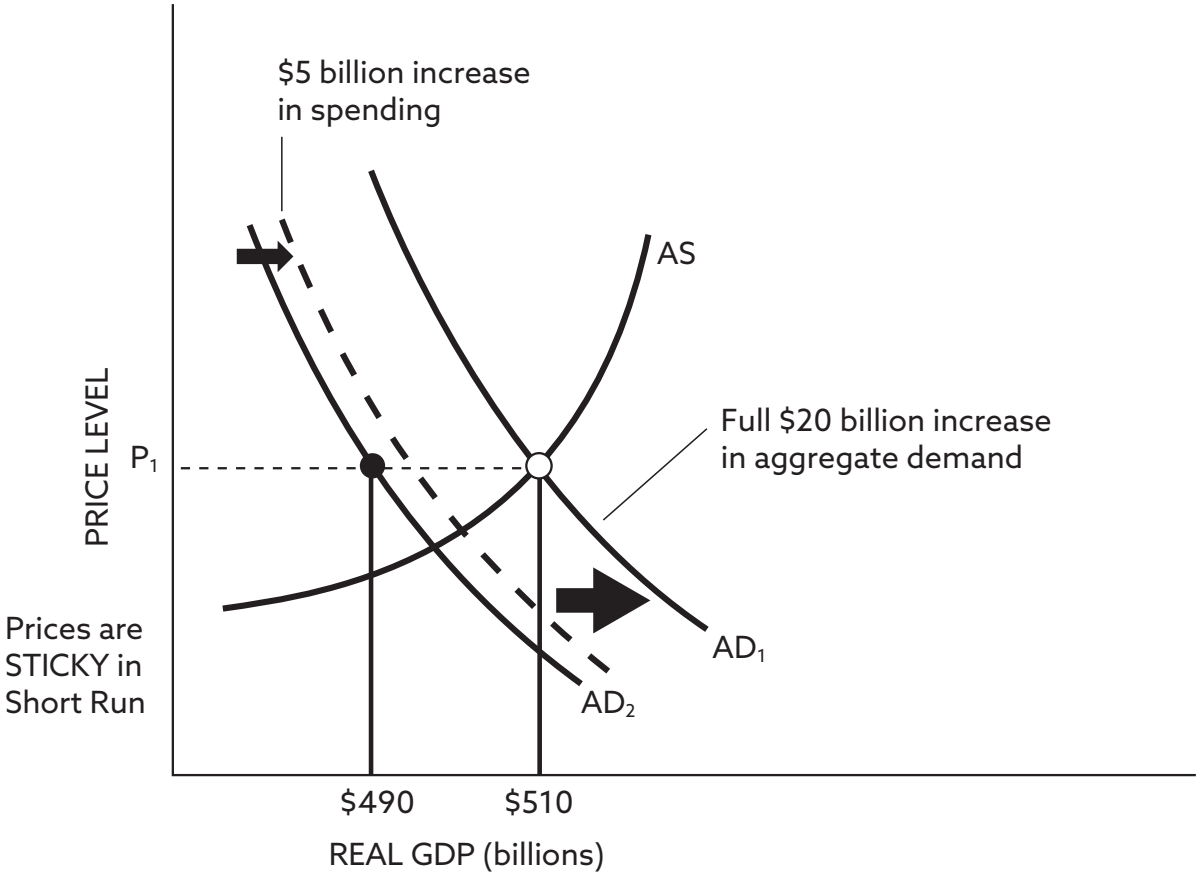
Expansionary Fiscal Policy



Contractionary Fiscal Policy

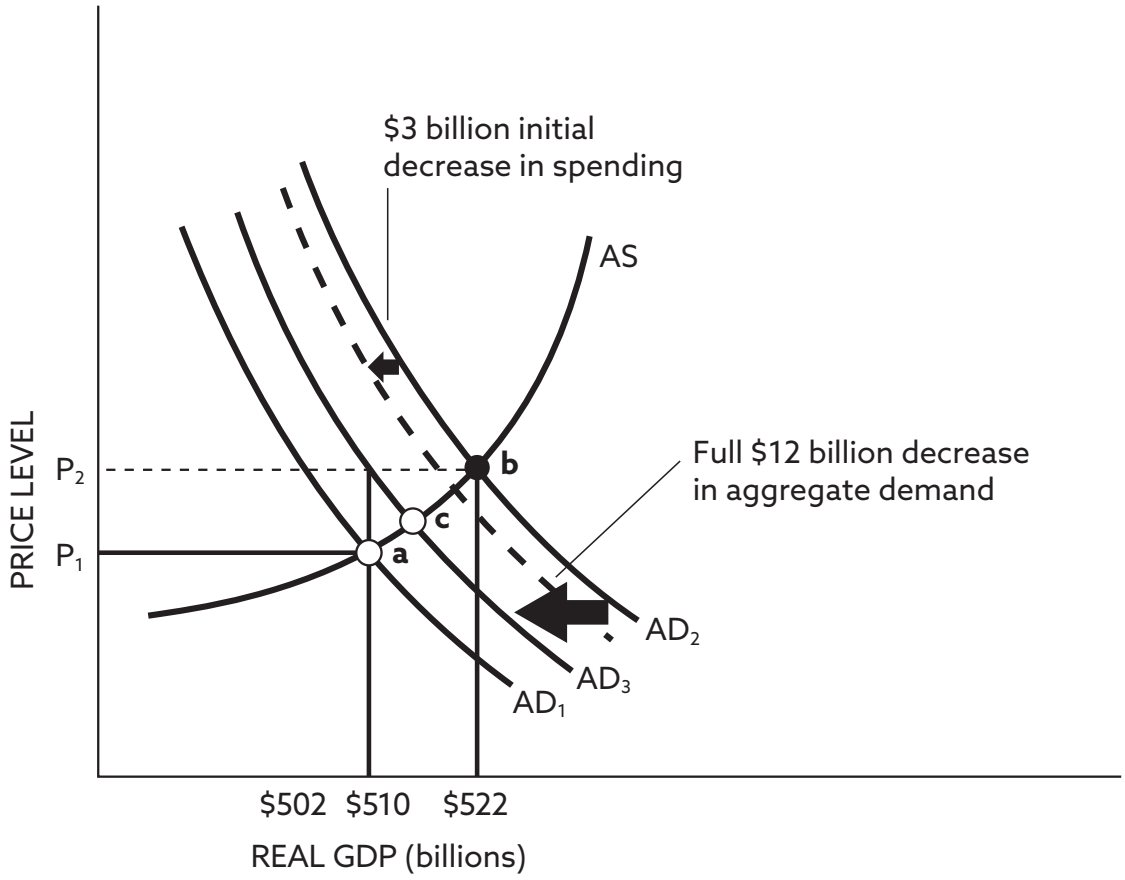


The Multiplier and Expansionary Fiscal Policy



- Recessions Decrease AD – Moves from AD_1 to AD_2
- How does the Economy get back to AD_1?

The Multiplier and Contractionary Fiscal Policy



Fiscal Policy Summary: Discretionary

Discretionary spending is money formally approved by Congress and the President during the appropriations process each year.

Expansionary

- Increase government spending
- Decrease taxes
- Increase transfer payments

Contractionary

- Decrease government spending
- Increase taxes
- Decrease transfer payments

Fiscal Policy Summary: Automatic Stabilizers

Automatic stabilizers are built into government budgets, without any vote from legislators, which increase spending or decrease taxes "automatically" when the economy slows and decrease spending and increase taxes when the economy is too hot.

Expansionary

- Unemployment insurance claims increase
- Progressive marginal tax rates decrease
- Government transfers increase

Contractionary

- Unemployment insurance claims decrease
- Progressive marginal tax rates increase
- Government transfers decrease

Fiscal Policy Lags

Recognition lags

- The time it takes for policymakers to recognize that the economy is experiencing a recession or inflationary pressures.
- It can take time for data to be collected, analyzed, and reported, leading to a recognition lag of an actual economic problem.

Legislative lags

- The time it takes for policymakers to pass legislation to implement fiscal policy measures.
- With political gridlock, debates, and competing opinions, legislation can take a while to pass, or never pass.

Implementation lags

- The time it takes for fiscal policy measures to be implemented and go into effect.
- For example, it may take months to set up new government programs, hire staff, or allocate funds to specific projects as outlined in legislation.
- By this point, output gaps could have gotten worse, changed, or even disappeared.

Interest, Risk, and Liquidity

What is Interest?

- Interest can be thought of as "the price of money" – the price you pay to borrow money or the cost you charge to lend money.
- Serves as a way to evaluate the opportunity cost of holding a particular financial asset.

  – If the interest rate is relatively low, the opportunity cost is small.

  – If the interest rate is high, the opportunity cost is greater.

Risk refers to the chance of loss.

- Risk tolerance is a balance of what people are comfortable with and their ability and willingness to grow their financial assets.

  – Everyone's risk tolerance is different.

- For financial investments, **risk** is the degree to which the actual rate of return on an investment can vary from the expected rate of return on the investment.

Liquidity

- Liquidity – How quickly a financial asset can be converted to cash.
- The most liquid forms of money are cash and demand deposits.

Financial Assets

Checking or Savings account

- Cash or cash equivalent – store of value, very little interest
- Cash and demand deposits are the most liquid form of money
- Fully insured by the Federal Deposit Insurance Commission (FDIC) so cannot decrease in value, even if bank closes

Certificates of Deposit (CD)

- Bank savings product that earns interest on a lump sum for a fixed period of time
- Lump sum must remain untouched for the period of time or face withdrawal penalties
- FDIC insured

Money Market

- Deposit account with higher interest rates than a savings account
- Account owner withdrawals are limited
- FDIC insured

Bonds

- Financial asset that is a loan "IOU" to the government or a corporation
- Paid back after a certain period of time
- Ratings system – AAA is the least risky, lowest interest. Moving down (from A to BBB for example) more risk of the bond issuer defaulting or going bankrupt and holder is paid $0

Stocks

- Ownership of a share of a company
- Value of a stock is based on supply and demand
- Technically have an unlimited earnings ceiling based on how a company performs, history, etc.
- Higher risk – if a company goes bankrupt then the stock becomes worthless

Treasury Securities

US Treasury Securities

- The collective name for bonds, bills, and notes that are sold by the US federal government.
- Maturity rate
  - – Bonds: 20 to 30 years
  - – Notes: 2 to 10 years
  - – Bills: 4 to 52 weeks
- The U.S. Department of the Treasury issues Securities to raise the money needed to operate the federal government.
- Treasury securities are considered a safe and secure investment option because the full faith and credit of the U.S. government guarantees that interest and principal payments will be paid on time.

Treasury Bonds are NOT THE SAME as Savings Bonds.

- Treasury bonds are highly liquid and can be traded on the secondary market
- Savings bonds have one owner and cannot be bought and sold between private parties.

Real Rate Calculation

Calculating the Real Rate of Inflation

- The Nominal Interest Rate is the rate unadjusted for inflation.
- It is the "headline" rate that we see when we put money in the bank, borrow with a loan, or pay with a credit card.
- The Real Interest Rate is the true purchasing power adjusted for inflation.
- **Real Rate = Nominal Rate – Inflation Rate**

Fisher's Hypothesis

- Nominal Rate = Real Rate + Expected Inflation.

  Example:

  Banks want a real profit of 3%. They will add an expected inflation rate of 2% so that borrowers pay a nominal interest rate of 5%.

  5% = 3%+2%

Rule of 72

$$t \approx \frac{72}{r} \qquad \frac{72}{\text{Interest rate}} = \text{Years to double investment (or debt)}$$

- **T** – number of periods required to double an investment's value
- **R** – interest rate per period as a percentage

What the Rule of 72 Can Determine

- How many years it will take for an investment to double at a given interest rate using compounding interest.
- How long it will take for debt to double if no payments are made.
- The interest rate an investment must earn to double within a specific time period.

The Functions of Money

How does money function in our economy?

- **Medium of Exchange** – Money is used to trade for goods and services.
- **Store of Value** – Money holds purchasing power over time.
- **Unit of Account** – Money is used as a measure to set prices and make economic decisions more easily by comparing the prices of different items and assessing their relative value in monetary terms.

Commodity Money and Fiat Money

- **Commodity money** – money that has intrinsic value – it has value even if it is not used as money. Examples: cattle, tobacco, gold, silver.
- **Fiat money** – currency not backed by a commodity like gold or silver. It is backed by the good faith and credit of the country issuing it.
  US currency is fiat money.

How the Federal Reserve Categorizes Money

The Federal Reserve (Fed) uses monetary aggregates (called M1 and M2) as a way to measure the money supply.

The formula for categorizing money is M2 = M1+M2

Table 4-3.1
HOW THE FEDERAL RESERVE CATEGORIZES MONEY

M1	M2
• Currency in circulation (not in Federal Reserve Banks or U.S. Treasury) • Demand Deposits and other checkable deposits • Traveler's Checks • Checkable Deposits • Savings Accounts • Money Market Accounts	• Small Denomination Time Deposits (such as certificate of deposits) • Money Market Funds

**Retirement accounts are not included in M1 or M2*

The Vocabulary of Money Creation

Required Reserve Ratio

- Also known as the reserve requirement
- The percentage of a bank's total deposits that it is legally required to hold as reserves.
- Purpose is to ensure that banks maintain a certain level of liquidity and stability in their operations.

Required Reserves

- The amount of funds that banks are obligated to hold in reserve based on the required reserve ratio.
- The portion of a bank's deposits that must be held in cash or deposited with the central bank and not available for lending or investment.
- Serve as a safeguard against potential deposit withdrawals

Excess Reserves

- The reserves held by banks above and beyond the required reserves. In other words, it represents the amount of reserves that a bank holds beyond what is mandated by the required reserve ratio.
- Banks can choose to hold excess reserves voluntarily as an additional buffer against unexpected events or as a strategic decision based on their lending and investment activities.

The Federal Reserve discontinued its reserve requirements in 2020, eliminating the difference between excess reserves and required reserves.

Bank Balance Sheets or T-Accounts

Starting with a Checking Account Deposit of $1,000 and a Required Reserve of 10%

Bank #1 Balance Sheet Step 1

Assets	Liabilities
Required Reserve: Excess Reserves:	Checking Account:

Bank #1 Balance Sheet Step 2

Assets	Liabilities
Required Reserve: $100 Excess Reserves: $900	Checking Account: $1,000

The bank makes a loan of $900. Asset or Liability?
What happens to Excess Reserves?

Bank #1 Balance Sheet Step 3

Assets	Liabilities
Required Reserve: $100 Excess Reserves: $0 Loans: $900	Checking Account: $1,000

Borrower deposits loan in Bank #2 with required reserve of 10%
Asset or Liability? Required Reserve? Excess Reserve?

Bank #2 Balance Sheet Step 4

Assets	Liabilities

Bank #2 Balance Sheet Step 5

Assets	Liabilities
Required Reserve: $90 Excess Reserves: $810	Checking Account: $900

The Money Multiplier and Scenarios

The Money Multiplier

- Represents the potential expansion in the money supply that can result from an initial deposit or injection of funds into the banking system.
- Is based on the concept of fractional reserve banking.
- Is the ratio of the money supply to the monetary base.

Money Multiplier = 1/rr

For example, if the required reserve ratio is 10%, the money multiplier would be 1 divided by 0.10, which equals 10.

1/10% = 1/.10 = 10

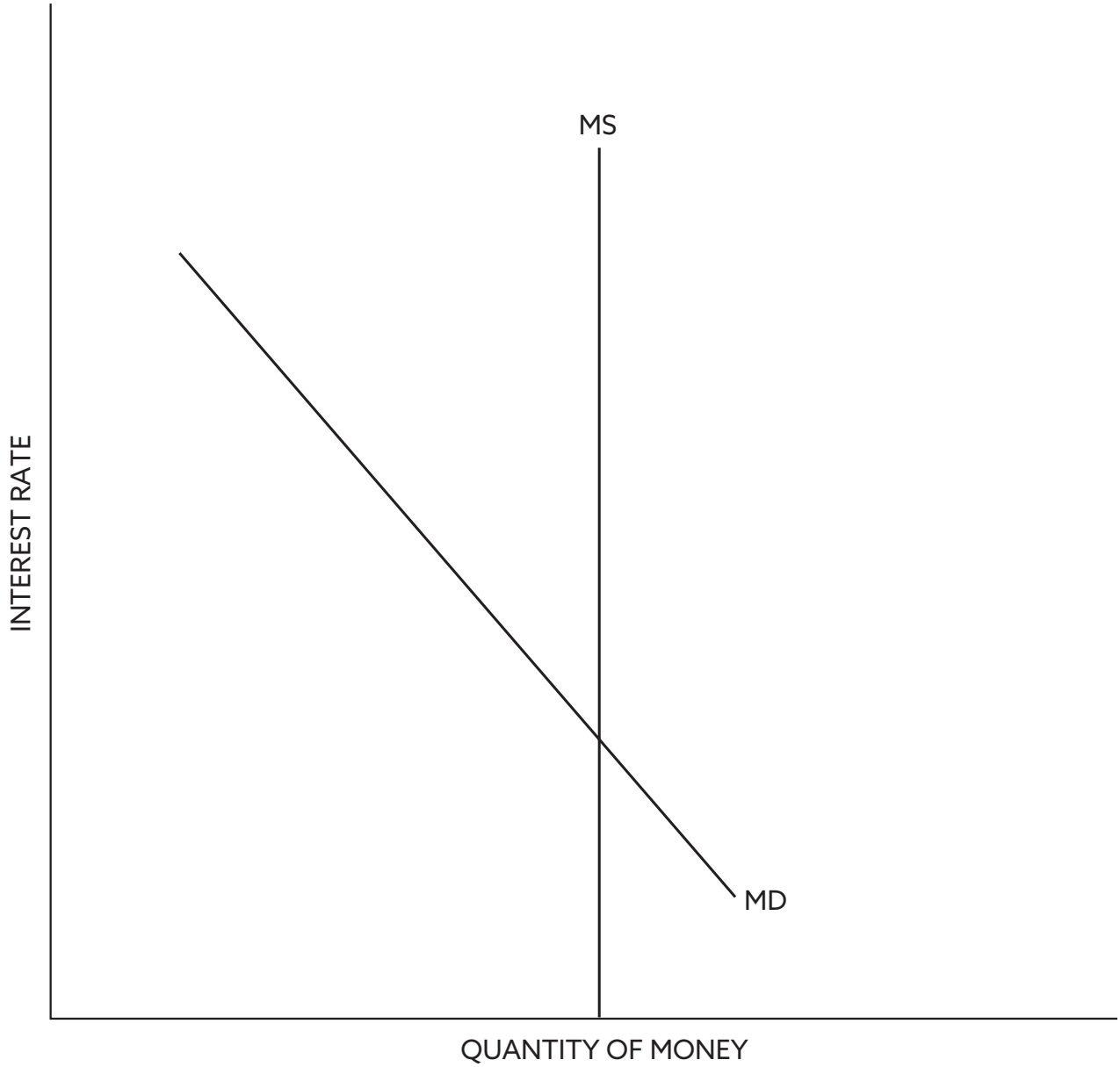
- To calculate maximum change to money supply over time from an initial deposit

  Change in Money Supply = initial Excess Reserves x Money Multiplier

- To calculate maximum change to new deposits over time from an initial deposit

  Money Multiplier x Deposit

The Money Market



The Demand for Money

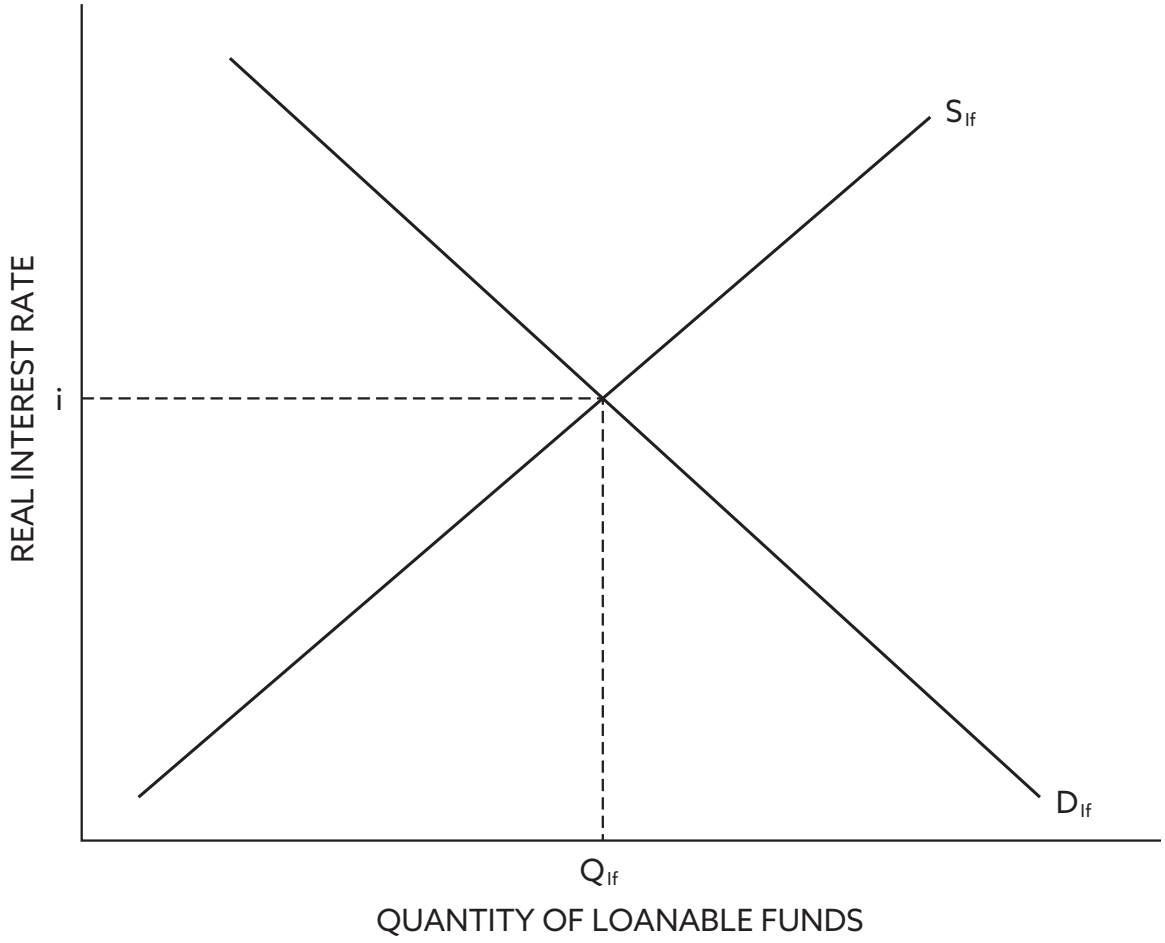
The quantity demanded of money has an inverse relationship with the interest rate.

- As the interest rate increases, the opportunity cost of holding money increases and people hold less money.
- As the interest rate falls, the opportunity cost of holding money falls and people hold more money.
- The negatively sloped demand curve for money represents the quantity of money demanded at various interest rates.

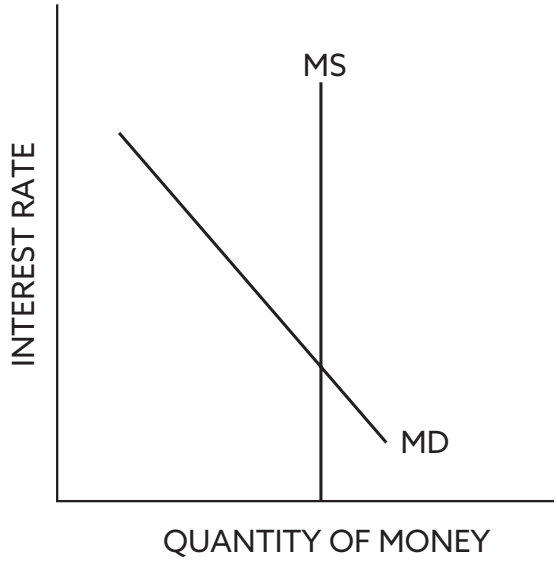
Three types of Demand for Money That Shift the Curve

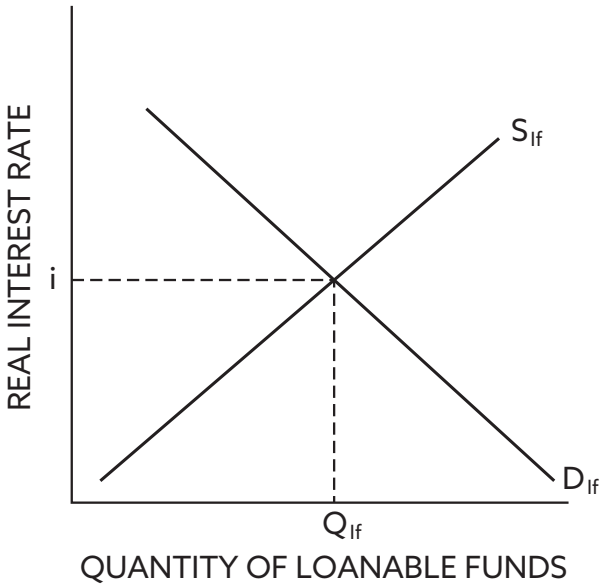
- Transaction demand – money needed to make purchases
- Precautionary demand – money needed for financial emergencies
- Speculative demand – money needed to serve as a store of wealth

Loanable Funds Market



The Money Market versus The Loanable Funds Market





Three Main Functions of the Federal Reserve

Financial Services

- Operates payment systems – ACH, Fedwire
- Provide currency
- Act as a fiscal agent for U.S. government
- Lend money to banks/discount rate
- Hold bank reserves

Supervision of Banks

- Enforce regulations set by Congress

Monetary Policy

- Charge interest on bank reserves
- Control the money supply

The Federal Reserve System

BOARD OF GOVERNORS

SEVEN MEMBERS APPOINTED BY THE PRESIDENT OF THE UNITED STATES
(AND APPROVED BY THE SENATE)

14 YEAR STAGGERED TERMS

(Chairperson appointed from the Board and serves a four-year term. Can be re-appointed)

OPEN MARKET COMMITTEE

7 Governors plus the President of the NY Fed and 4 regional Presidents who serve on a rotating basis. Make decisions about monetary policy.

FEDERAL ADVISORY BOARD

12 members, one nominated from each Regional Federal Reserve Bank

12 REGIONAL FEDERAL RESERVE BANKS

(1) BOSTON A

(2) NEW YORK B

(3) PHILADELPHIA C

(4) CLEVELAND D

(5) RICHMOND E

(6) ATLANTA F

(7) CHICAGO G

(8) ST. LOUIS H

(9) MINNEAPOLIS I

(10) KANSAS CITY J

(11) DALLAS K

(12) SAN FRANCISCO L

25 BRANCH BANKS

FINANCIAL INSTITUTIONS

Two Central Banks: A Comparison

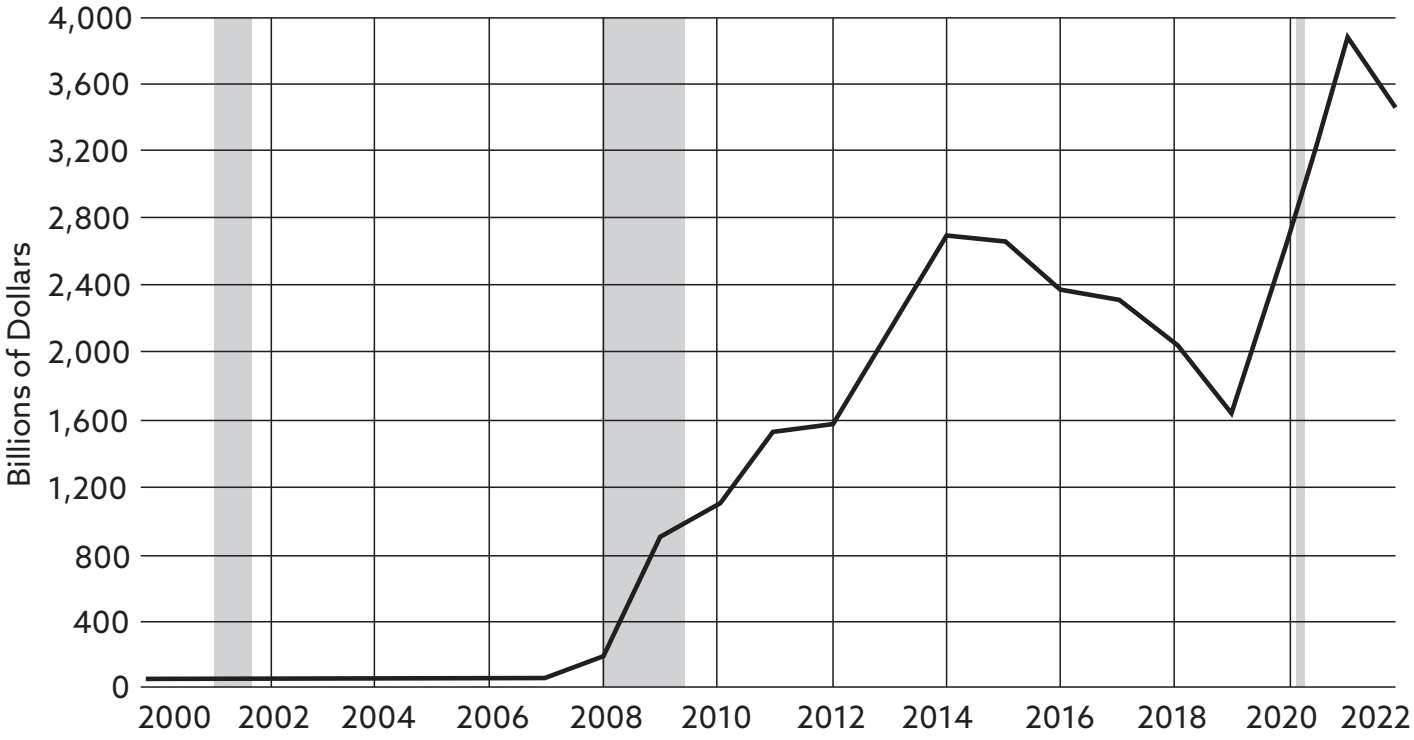
The Federal Reserve (The Fed)

- The Fed operates in the United States, overseeing monetary policy for the U.S. economy.
- The Fed is a decentralized system consisting of twelve regional Federal Reserve Banks, each with its own board of directors.
- The Fed is an independent entity that operates with a degree of autonomy from the U.S. government.
- Although the Board of Governors is appointed by the President and confirmed by the Senate, the Fed is designed to be independent to insulate monetary policy decisions from short-term political pressures.
- The Fed's dual mandate is to promote price stability and maximum employment. It uses policy tools such as interest rate adjustments, open market operations, and reserves to influence the U.S. economy.

The European Central Bank (ECB)

- The ECB operates within the Eurozone, which consists of numerous European Union member countries that have adopted the euro currency.
- The ECB is centralized and located in Frankfurt, Germany, with decision-making power held by the ECB's Governing Council and Executive Board.
- The ECB operates independently as well, but its decision-making is influenced by input from representatives of Eurozone countries and coordinated with EU institutions.
- The ECB's primary objective is to maintain price stability within the Eurozone. It also considers other economic factors but does not have a formal employment mandate like the Fed. The ECB's responsibilities extend beyond monetary policy to include maintaining the stability of the euro and fostering harmonious economic and financial conditions among member states.

Reserves in the Banking System 2000 – 2023



Source: Board of Governors of the Federal Reserve System (US)

Limited Reserves System

Powers for Limited Reserves

Power	Description	Impact
1. Reserve Requirement Rate	The Fed sets the percentages of bank deposits that must be held as reserves.	Increase or decrease the excess reserves a bank has available to loan when people deposit money.
2. Discount Rate	The rate that commercial banks must pay to borrow from the Fed.	Increase or decrease the availability of excess reserves banks have access to from the Fed.
3. Open Market Operations	Fed buying Treasury Bonds from the banks or selling Treasury Bonds to the banks.	Immediately increase excess reserves (Buying Bonds = Bigger Bucks) or decrease excess reserves (Selling Bonds = Smaller Bucks).

Ample Reserves System

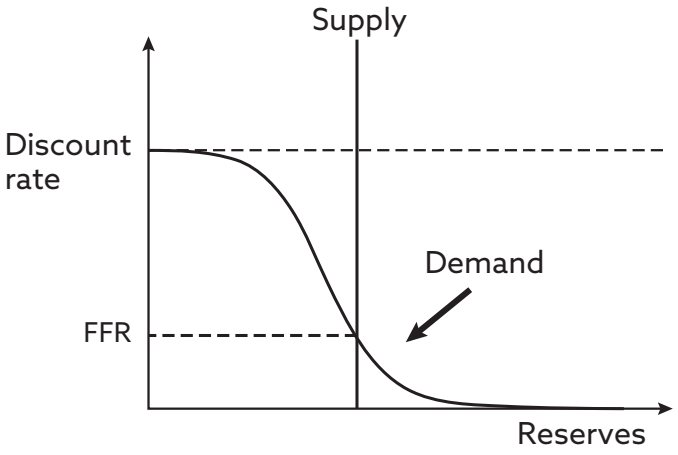
The Fed needs to increase or decrease the money supply. It sets a "target" Federal Funds Rate and uses the powers below to drive the market for money towards that rate.

Powers for Ample Reserves

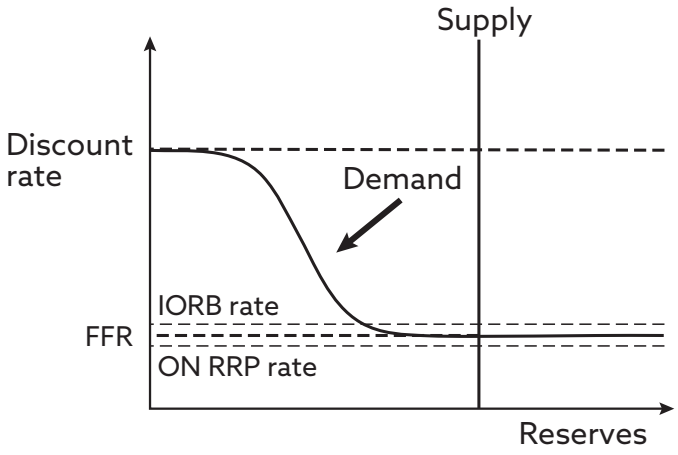
Power	Description	Impact
1. IORB - Interest on Reserve Balance (Administered Rates) ***New main power of the Fed***	The savings rate the member banks earn on their reserve deposits at the Fed. Set by the Fed and not determined by the market. It is the price floor in the market for reserves.	This represents the base profit for the bank. By raising or lowering this rate, this encourages or discourages banks to either keep the reserves at the Fed (decreasing the money supply) or to make them available to lend to the public (increasing the money supply).
2. ON RRP rate – Overnight Reserve Repurchase agreement offering rate	A lower rate than the IORB. Banks purchase securities from the Fed, hold them overnight, and then sell them back to the Fed (the Fed repurchases them) at a determined interest rate.	Works in a similar way to the IORB. However, this rate is lower, and is used as a supplementary tool to help control the Federal Funds rate – a "sub-floor" to the IORB.
3. Discount Window (and its Discount Rate)	The rate that commercial banks must pay to borrow from the Fed. This is the "lender of last resort" rate for banks that can't borrow money from anywhere else.	Increase or decrease the availability of excess reserves banks have access to from the Fed.
4. Open Market Operations	Fed buying Treasury Bonds from the banks or selling Treasury Bonds to the banks.	In an ample reserve system, this tool is still used but now only to maintain that reserves are ample if there is a lot of pressure on borrowing.

Comparing Graphs: Limited Reserves and Ample Reserves

Limited Reserves



Ample Reserves



Fed Actions and Their Effects Graphic Organizer

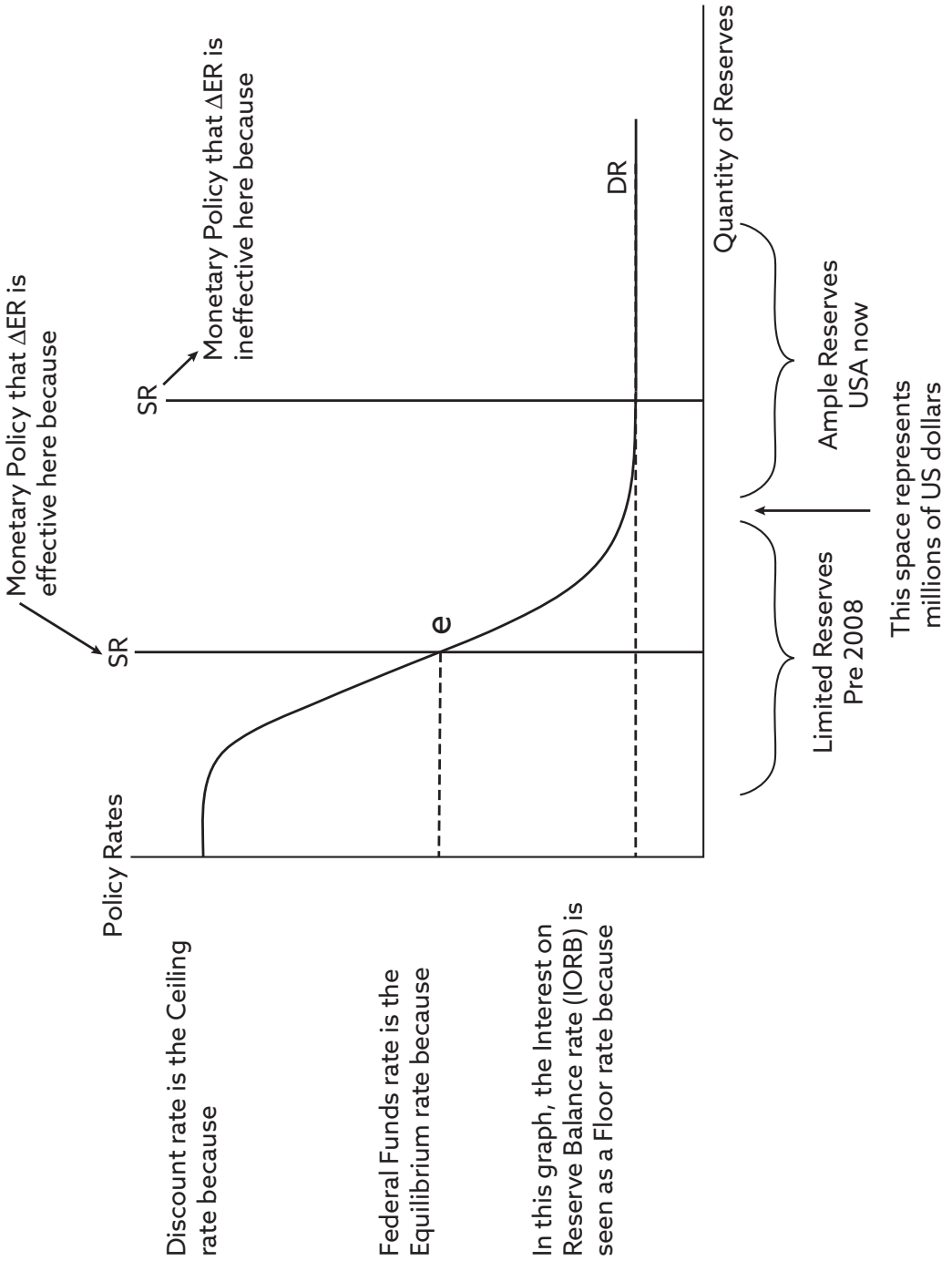
Student Alert: Open market operations include buying and selling government bonds. When you are asked about an open market operation, you should answer in terms of buying bonds or selling bonds.

Complete Activity 4-8.1. Illustrate how the Fed's Monetary Policy creates a chain reaction throughout the banking system to increase or decrease AD.

Fed Actions and Their Effects

Type of Reserve	Federal Reserve Action	Bank Reserves	Money Supply	Federal Funds Rate	Nominal Interest Rate	Borrowing & Investment Spending	AD
Limited	Solid Treasury securities on the open market						
Limited	Bought Treasury secruities on the open market						
Limited /Ample	Raises the discount rate						
Limited /Ample	Lowered the discount rate						
Limited	Lowered the reserve requirement						
Limited	Raised the reserve requirement						
Ample	Increase Interest on Reserve Balance Rate						
Ample	Decrease Interest on Reserve Balance Rate						

Market For Reserves: Limited System – Ample System

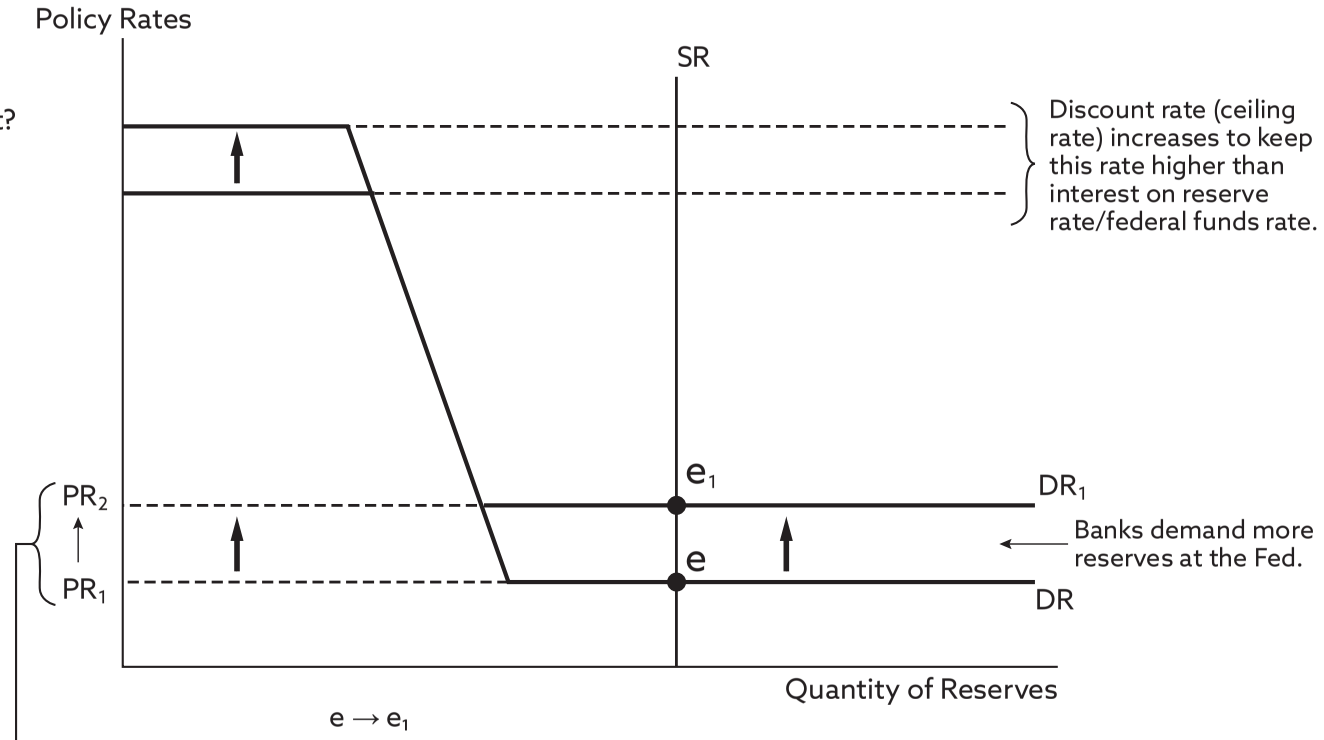


Contractionary Monetary Policy

Which way did the graph shift?

What is the purpose of the shift?

What is the macro goal?



Fed increases policy rates interest on reserve rates and base profit rate of banks by earning interest on reserves they have at the Fed.

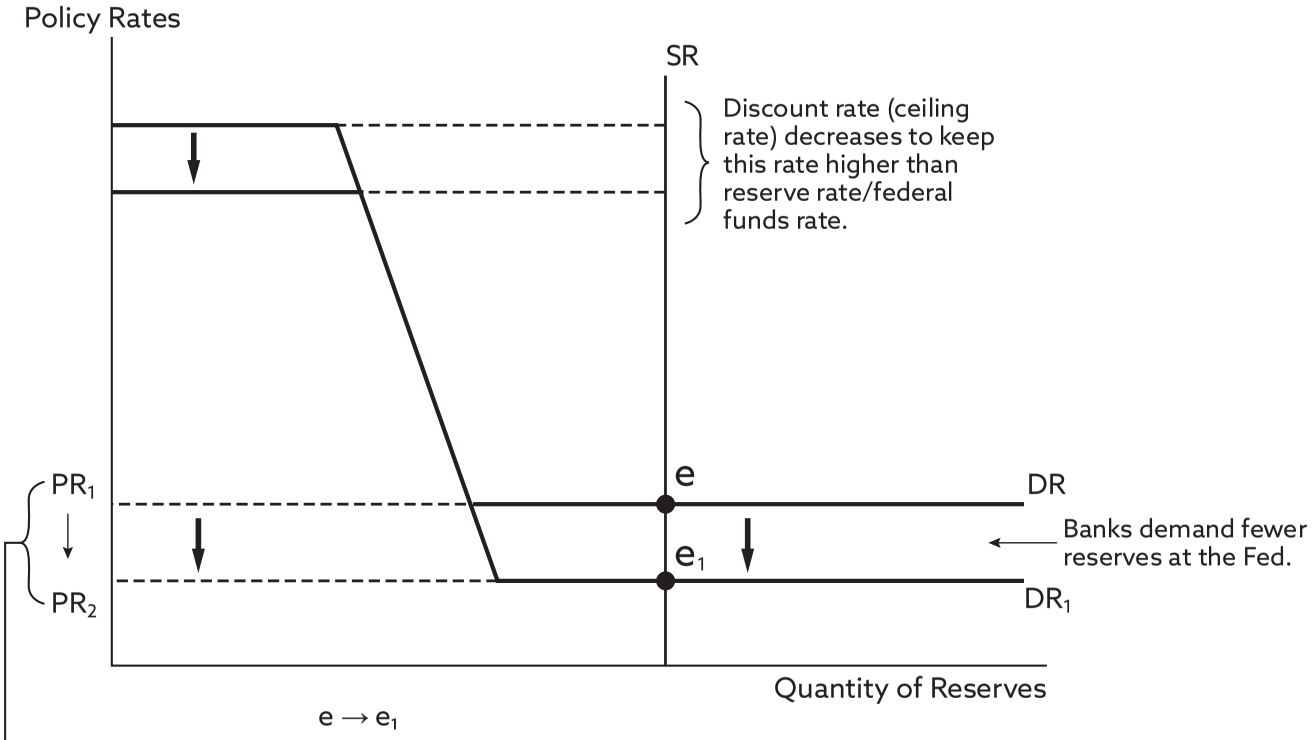
Fed increasing interest on reserve rate causes banks to _____ FFR to each other. If they loan money to each other, they would only do it for a _____ rate rather than the interest rate they are earning by leaving money in the Fed.

Expansionary Monetary Policy

Which way did the graph shift?

What is the purpose of the shift?

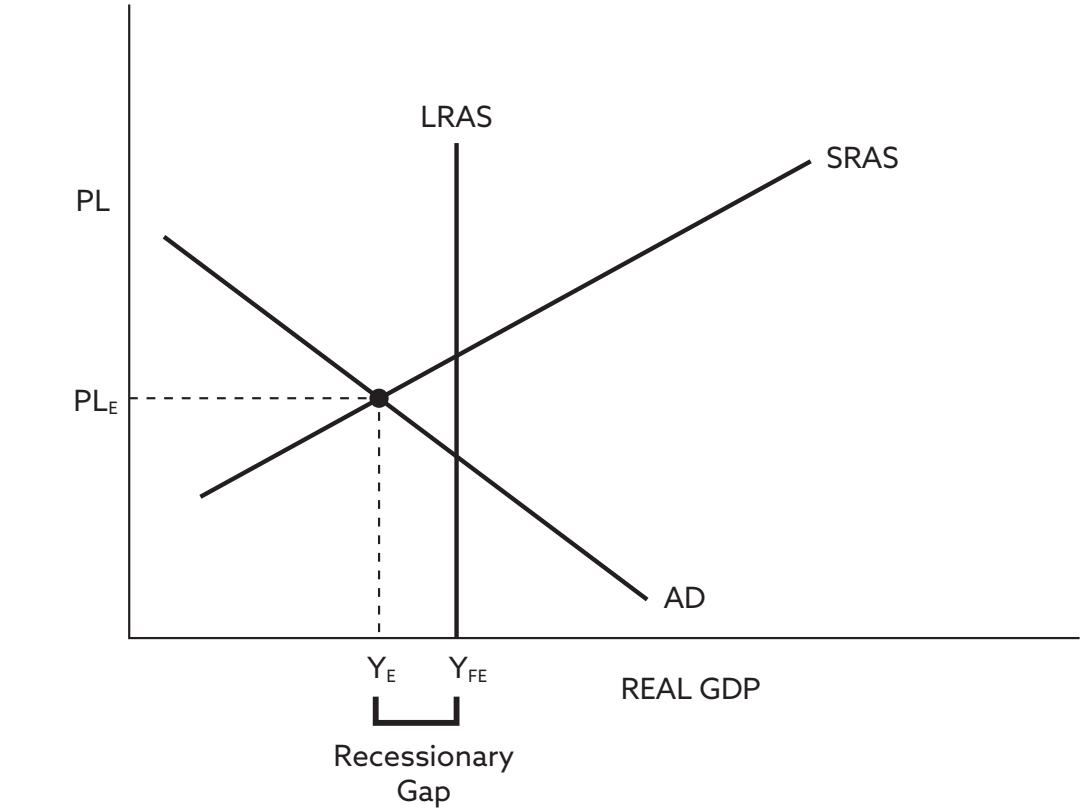
What is the macro goal?

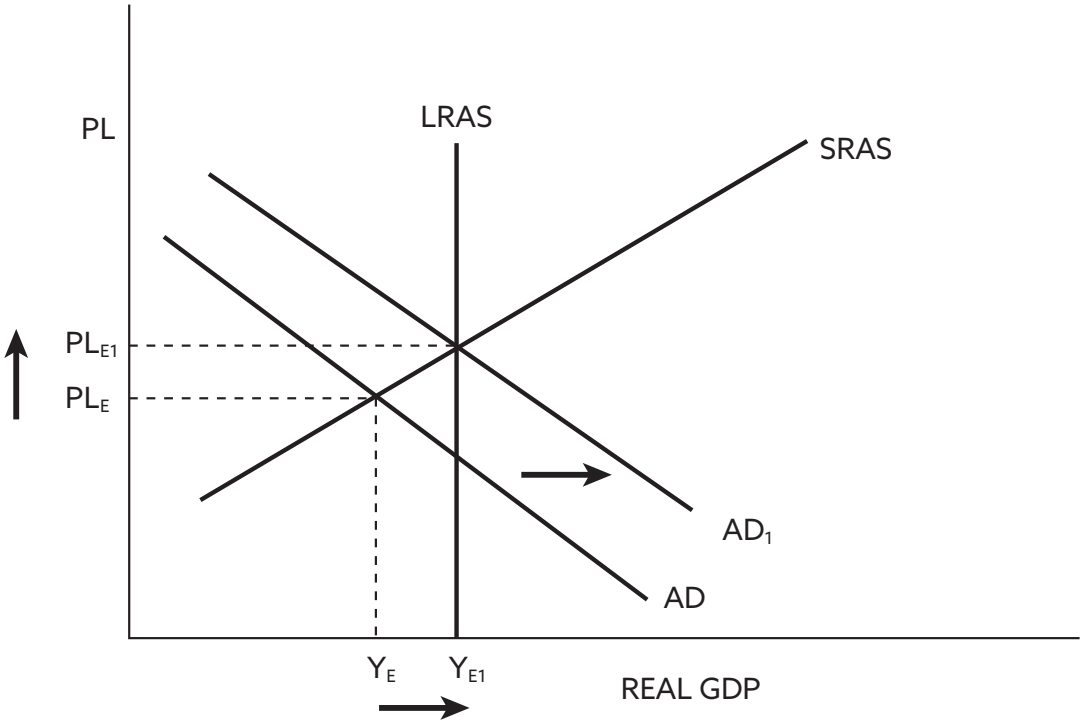


Fed decreases policy rates interest on reserve rate. Base profit rate of banks by earning interest on reserves they have at the Fed.

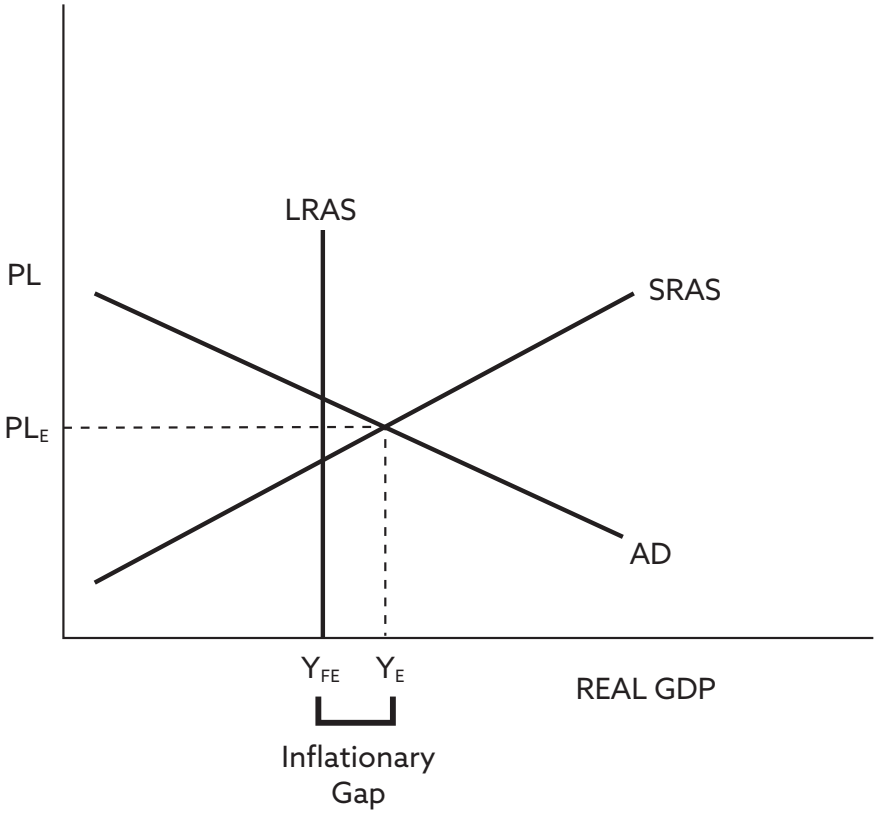
Fed decreasing interest on reserve rate causes banks to _____ lending at FFR to each other because

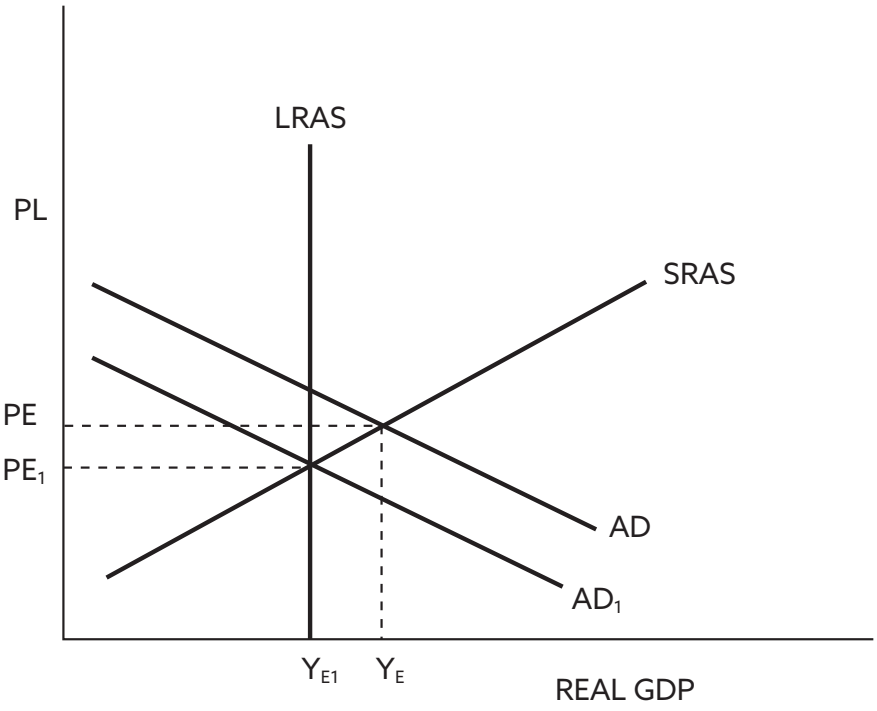
Expansionary Graphs



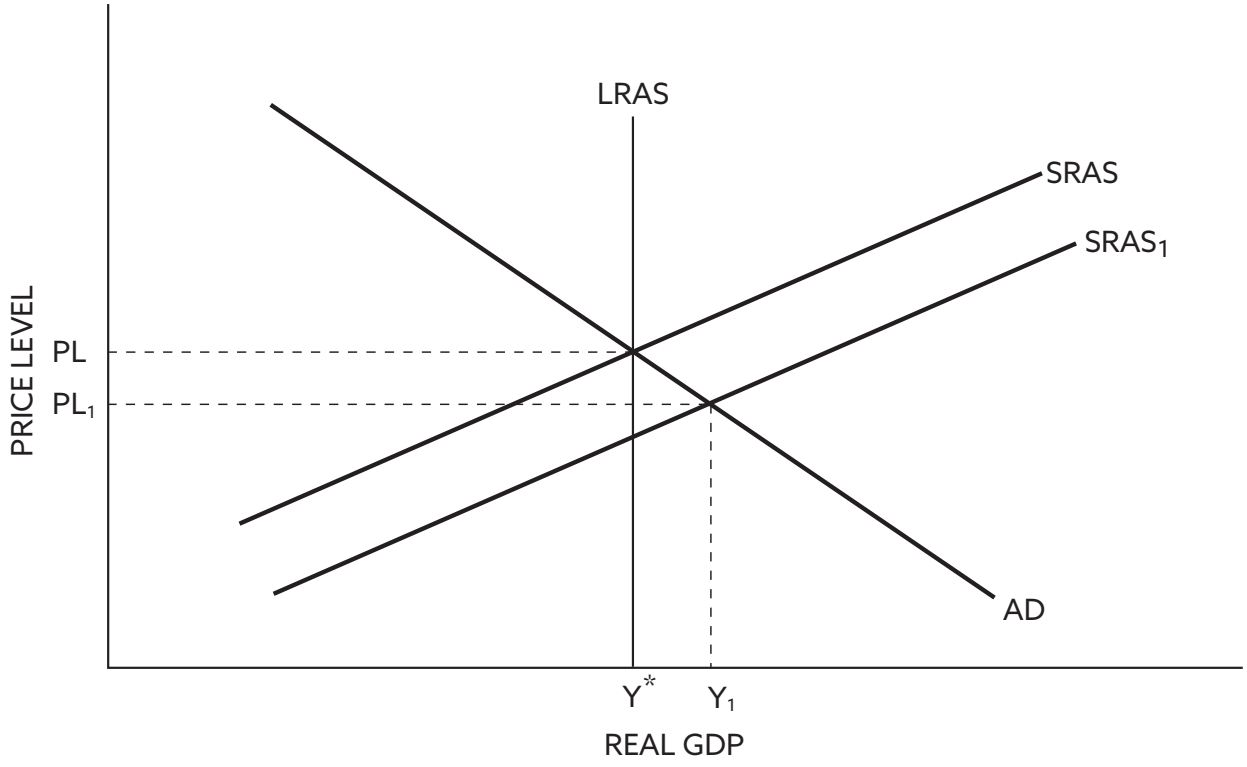


Contractionary Graphs

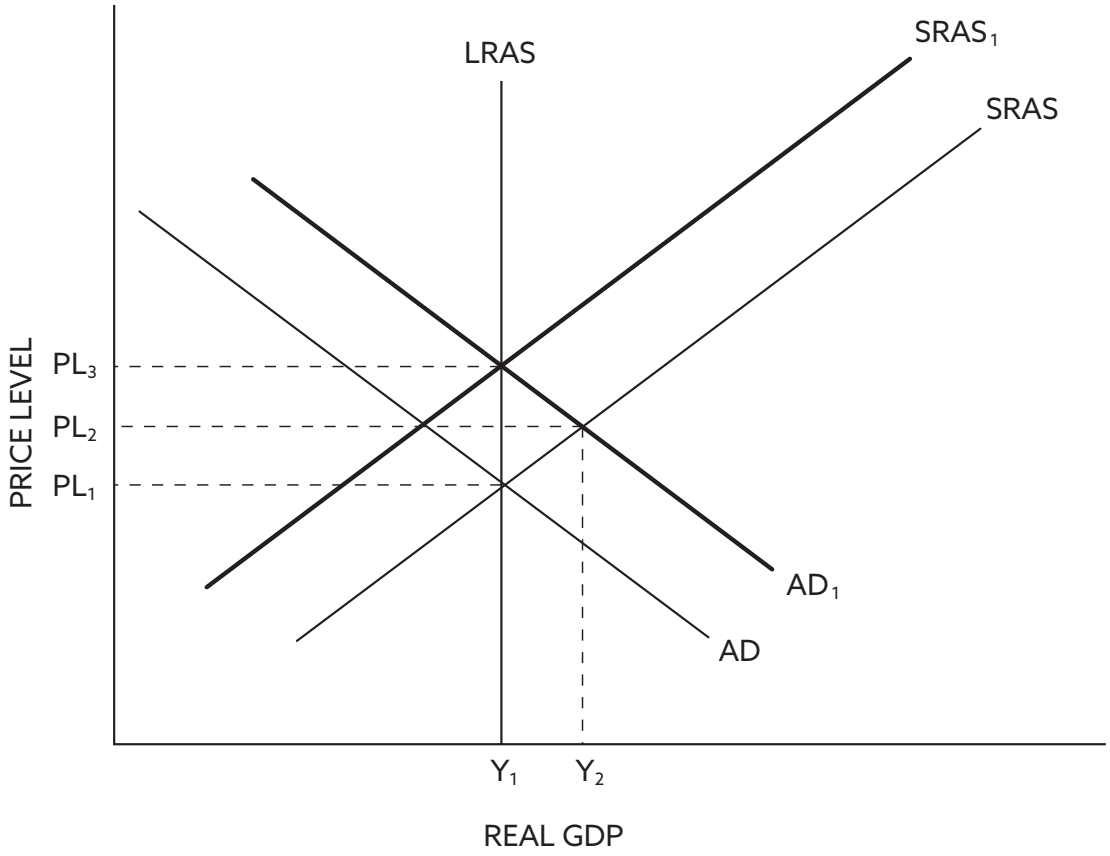




Increasing Aggregate Supply



Long Run Adjustment of Aggregate Supply



Money Growth and Inflation

MV = PQ

M = the money supply

V = the velocity of money (the number of times an average dollar bill is spent)

P = the average price level

Q = real value of all final goods and services (rGDP)

Debt vs. Deficit

Budget deficit

- government spending > tax revenues

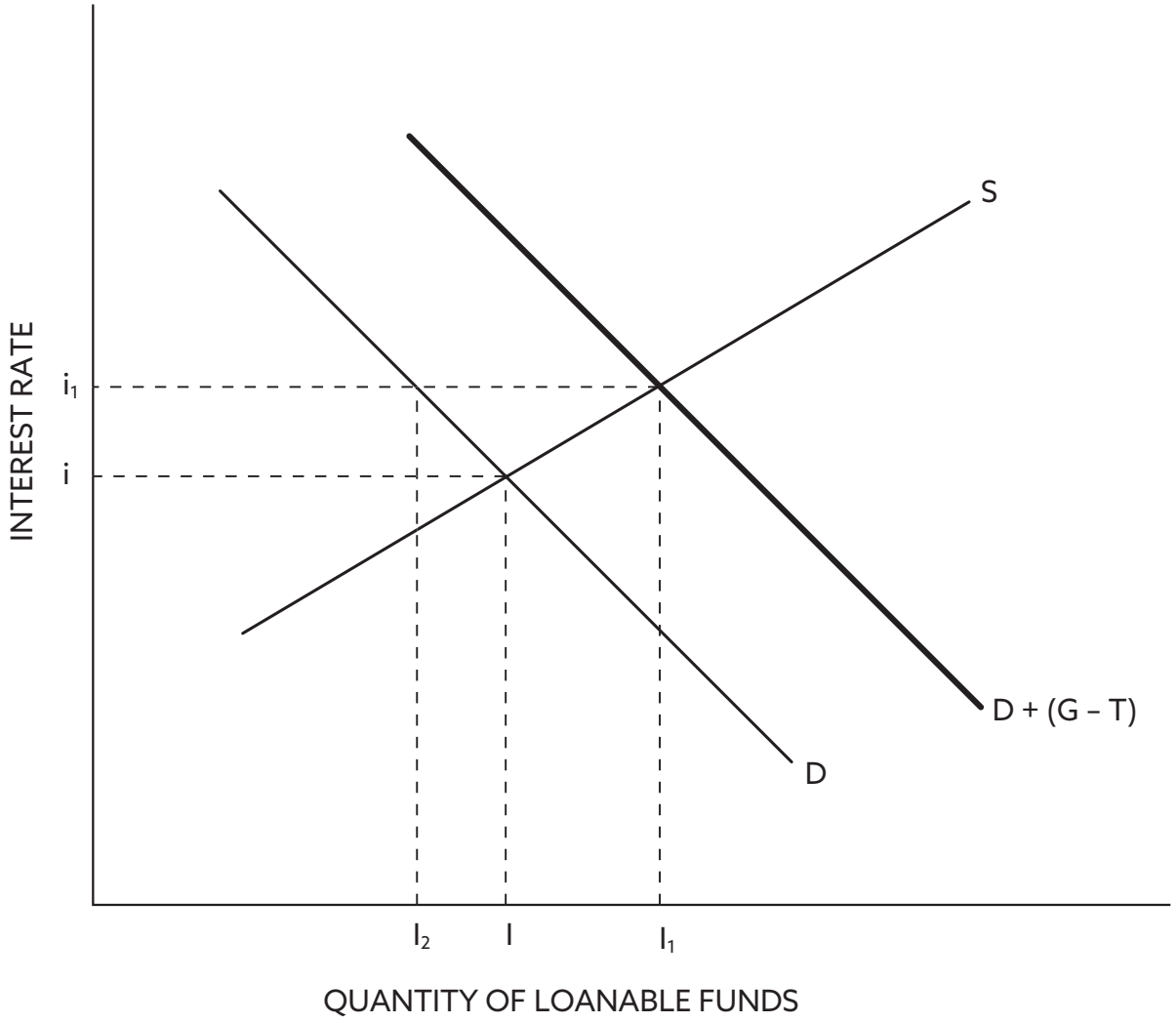
Budget surplus

- government spending < tax revenues

National or Public Debt

- total of all past Federal deficits and surpluses

Loanable Funds Market



- I and i are the initial equilibrium values.
- D = private sector demand for funds (investment).
  D+(G-T) = private + government demand for funds.
- I_1 and i_1 are the new equilibrium values.
- I_2 = new level of private investment.
- $I_1 – I_2$ = government demand for funds (G-T).

The Crowding Out Effect

1. When the government borrows money, it increases the demand for money.

2. When aggregate demand increases – the price level rises, raising interest rates

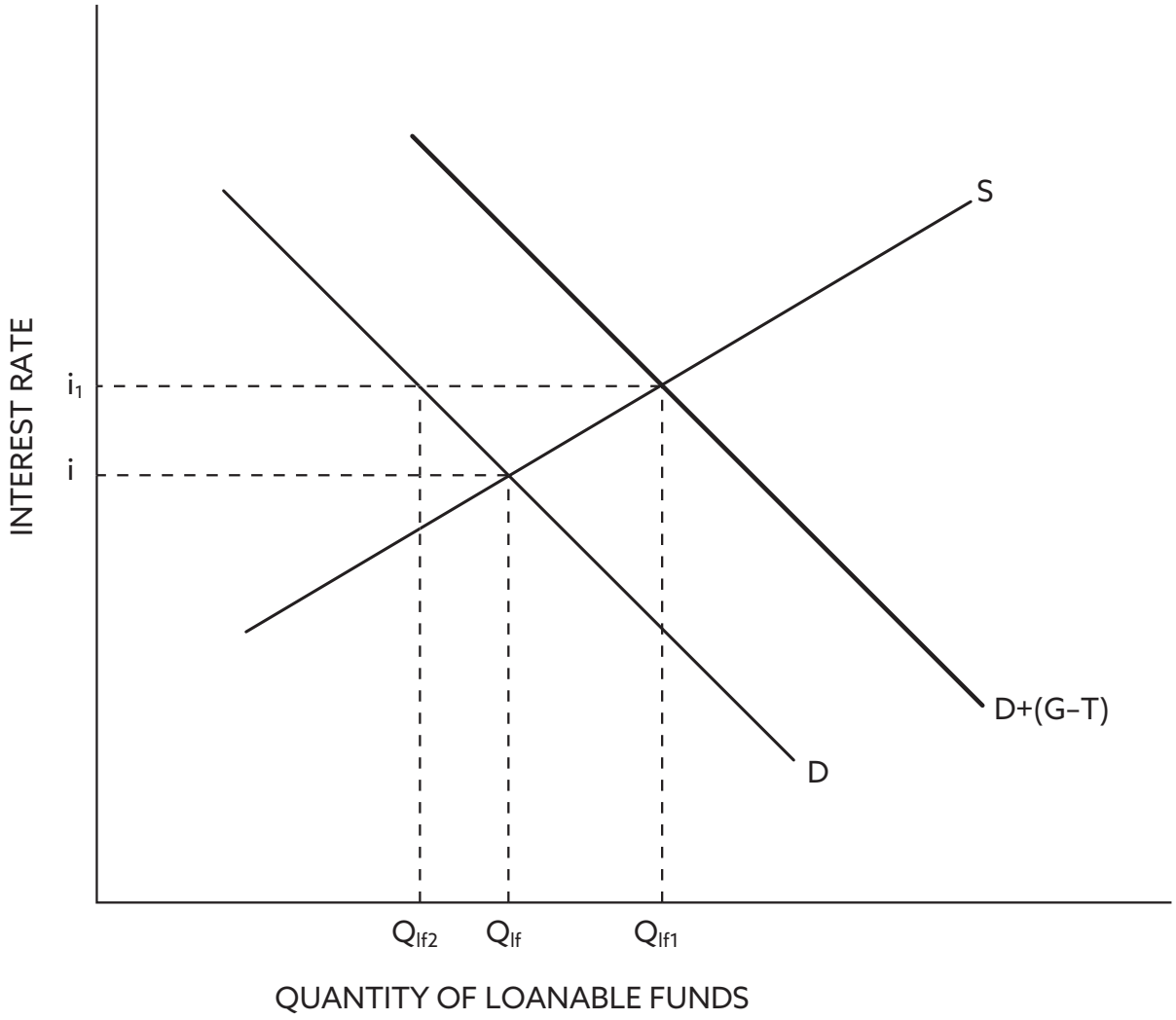
3. When the interest rate rises, some investment spending will be "crowded out." (It's harder to borrow money)

Less likely in a recession

- Not much investment for government to crowd out.

- If govt debt is used to fund capital improvements – better transportation, education, etc. and improve investment prospects for businesses, it offsets the crowding-out effect.

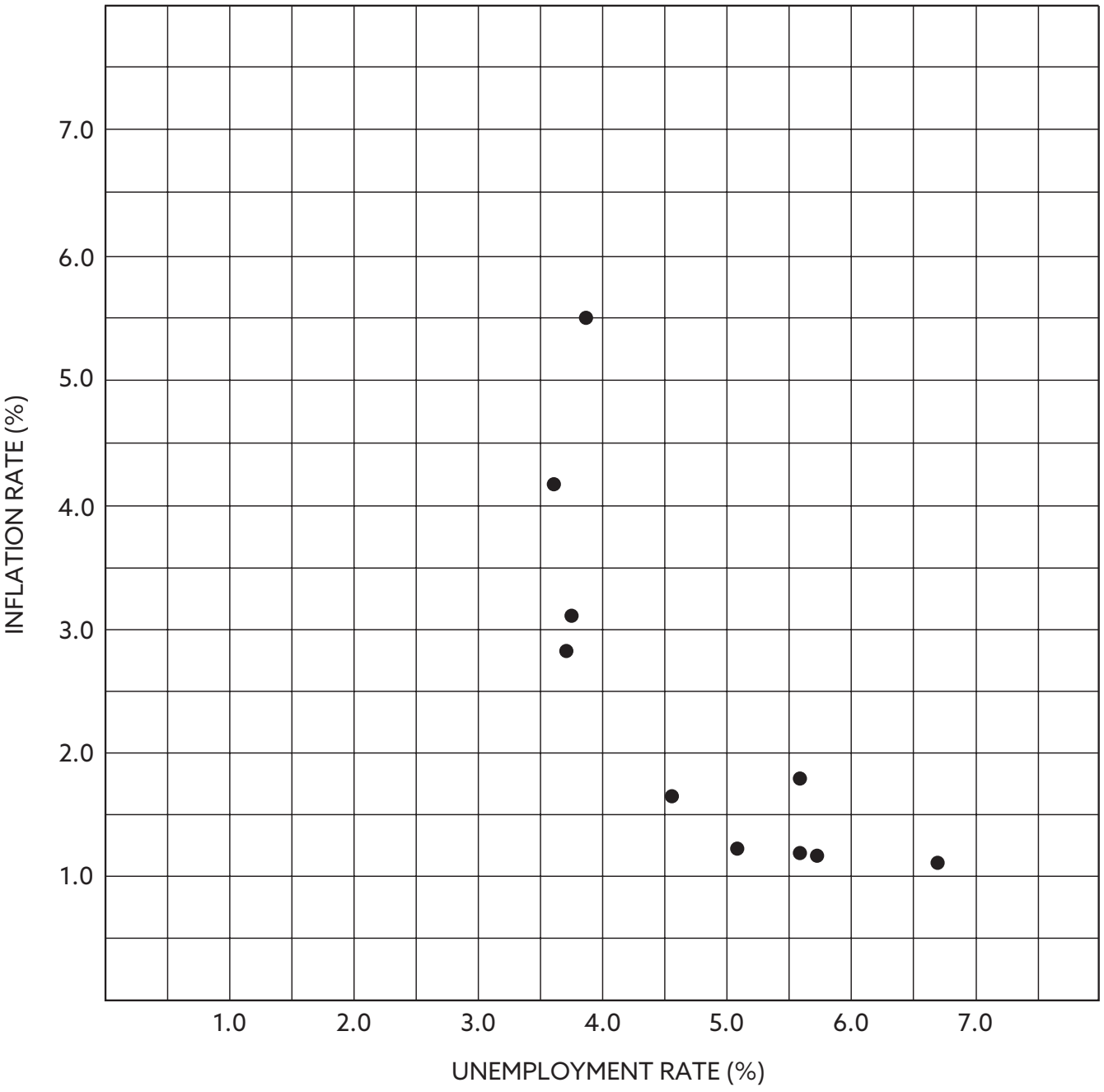
Loanable Funds Market



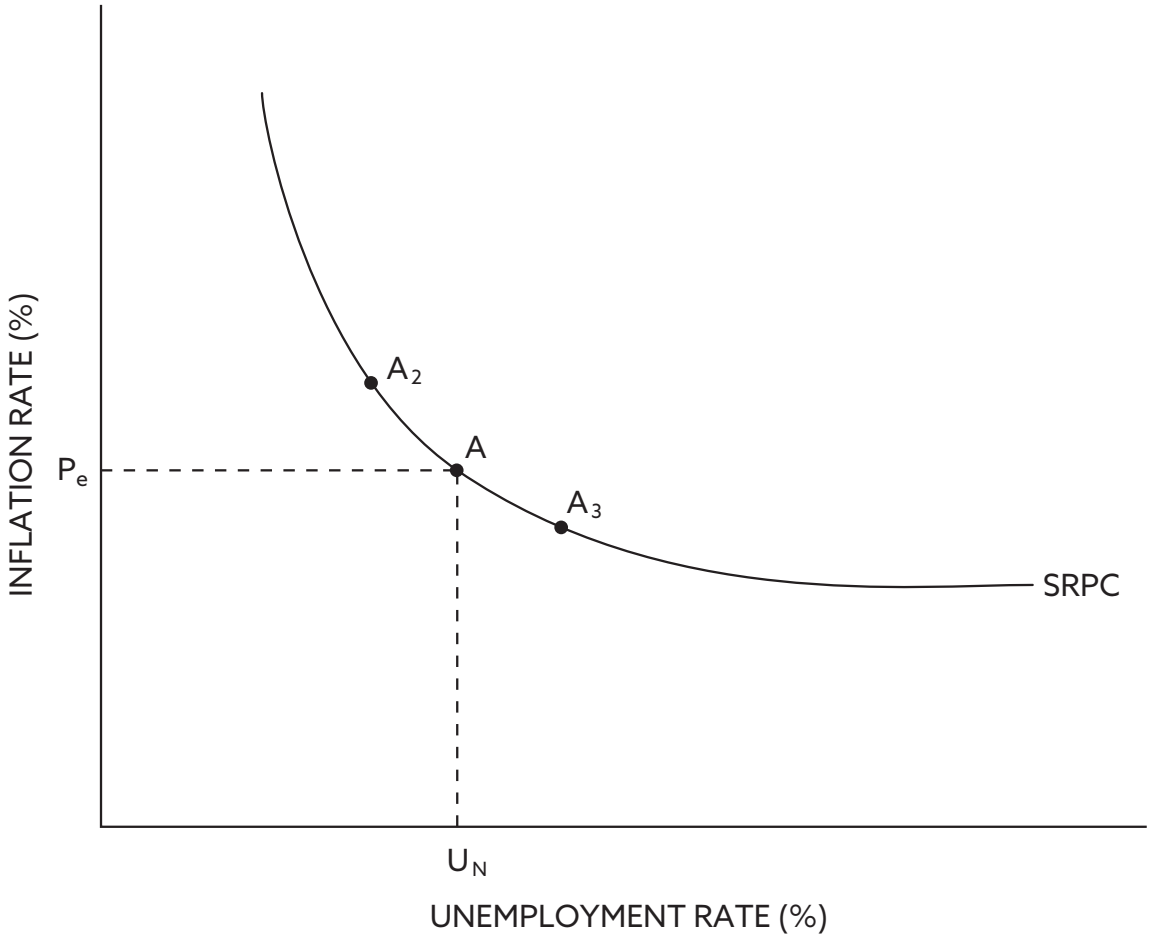
Data for a Phillips Curve

Unemployment rate (%)	Inflation rate (%)
5.54	1.7
6.69	1.1
5.57	1.2
5.64	1.2
5.16	1.3
4.51	1.6
3.79	2.9
3.84	3.1
3.56	4.2
3.49	5.5

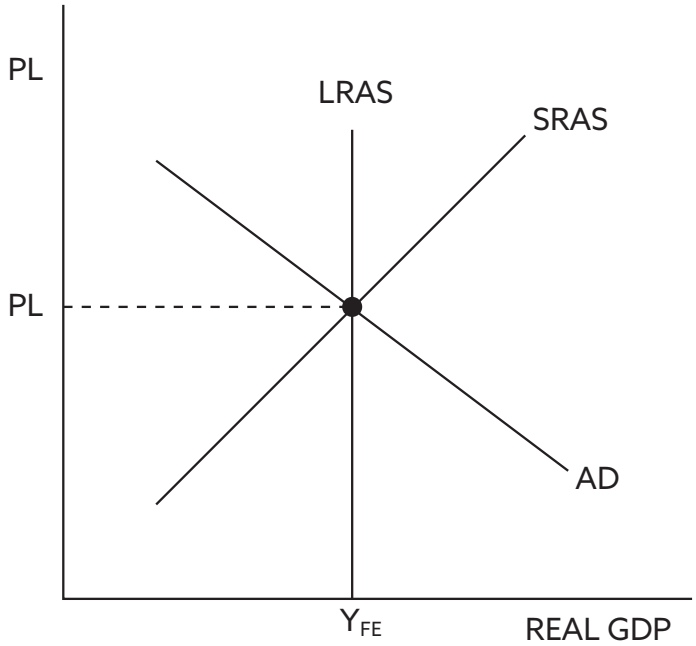
Bell Ringer Phillips Curve

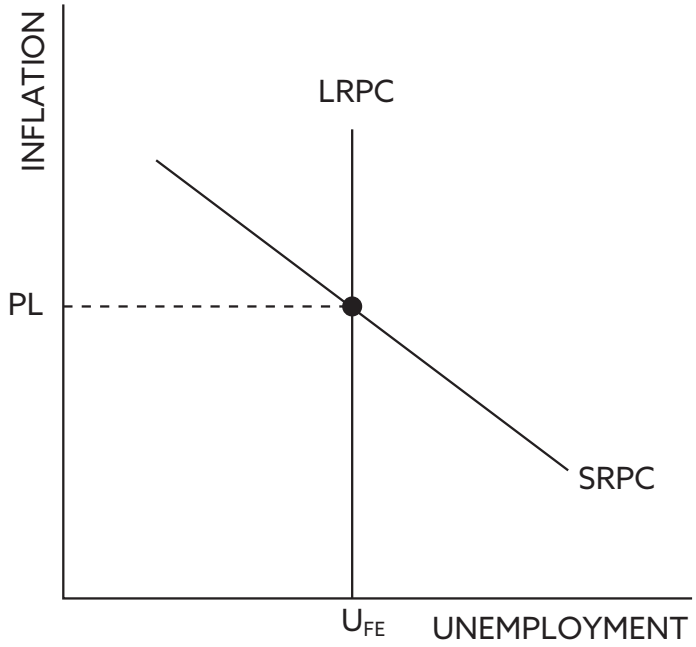


Short-Run Phillips Curve

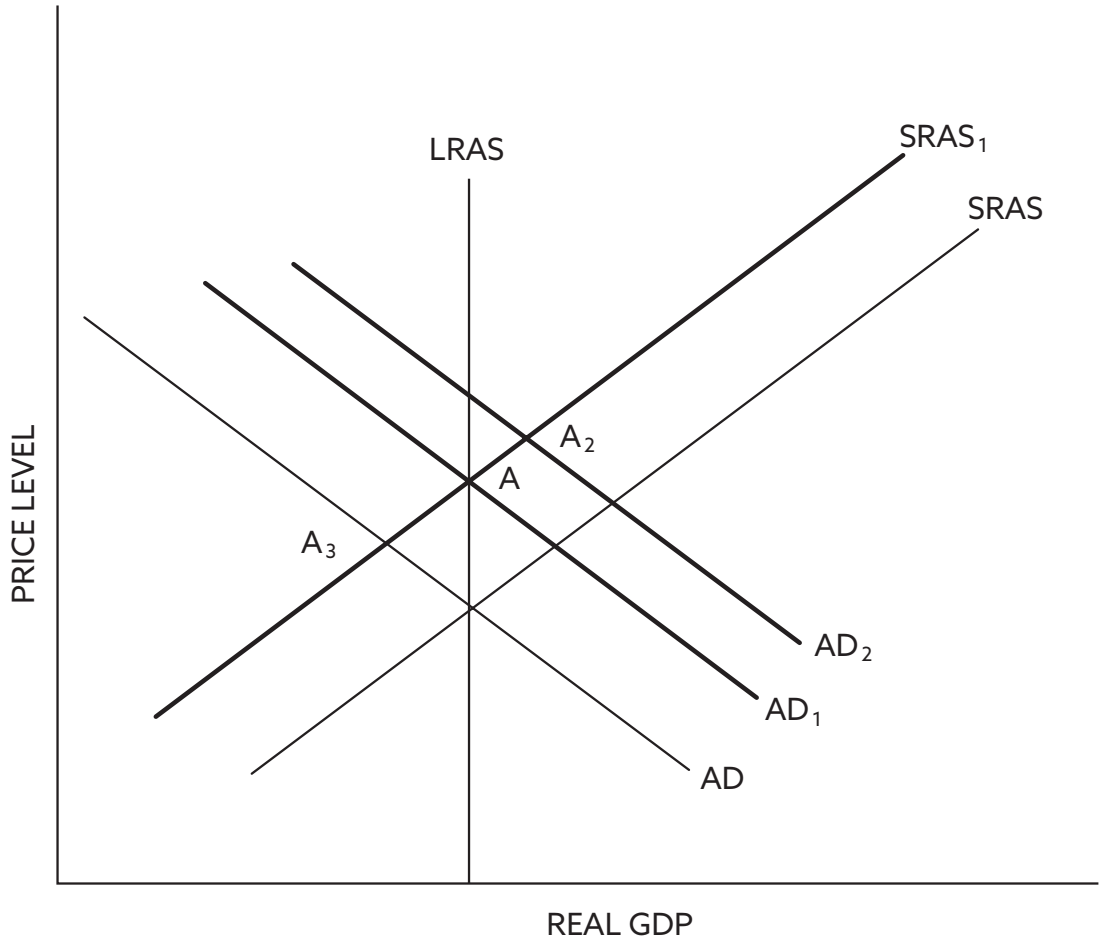


Comparing the LRAS Curve and the Phillips Curve

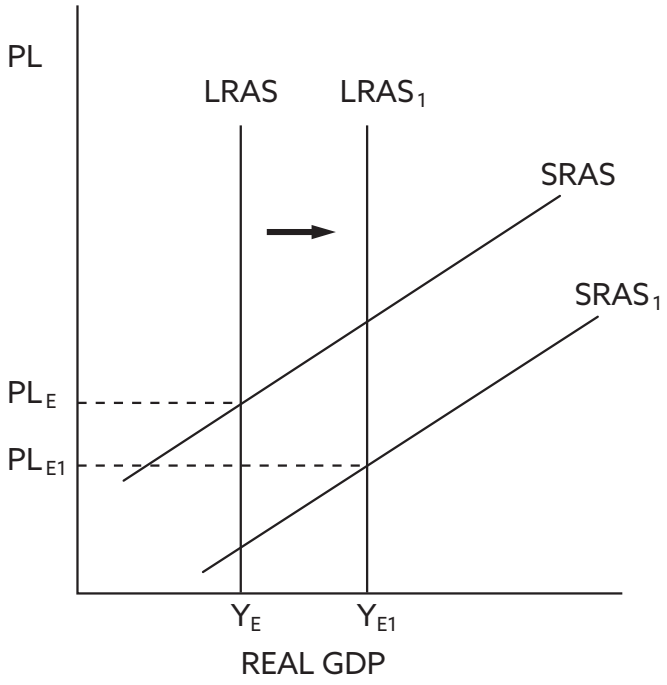


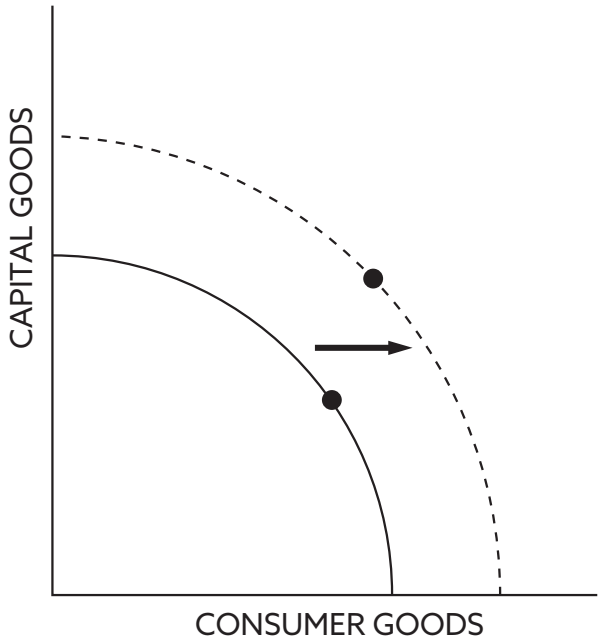


Explaining the Phillips Curve



Economic Growth





Sources of Long-Term Growth

1. The quantity and quality of labor
2. The quantity and quality of capital
3. The level of technology

Increases in any one of these elements will increase real GDP.

- The growth in the quantity of labor is primarily the result of population growth.
- The quality of labor is affected by improvements in education, training, and health of workers.
- Investment and research and development result in improvements in capital and technological advances.
- Increases in capital or technological advances increase productivity and thus increase real GDP.

Factors that Contribute to a Nation's Productivity

Capital per worker

- "Capital" = the tools of production. A country's workforce is more productive if the workforce has more and better tools with which to work.
- Private capital – workers use to produce goods and services.
- Public capital – infrastructure and includes roads, bridges, power lines, and information networks.

Human capital per worker

- The workforce uses its collective experience and education to produce goods and services.
- Human capital can be acquired through formal schooling, occupational training, or simply accumulated experience at the workplace.

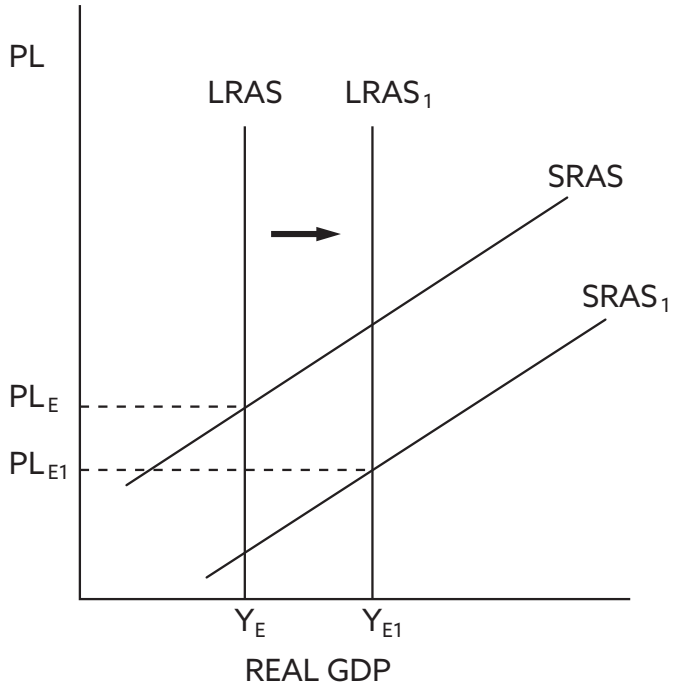
Natural resources per worker

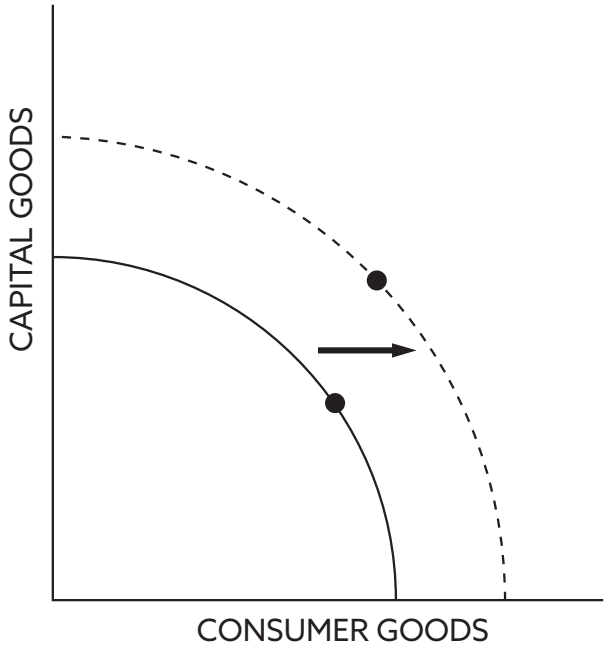
- Production inputs that come from the world around us.
- Minerals, sources of energy, rivers, forests, and fisheries.
- A country's workforce can be more productive when they have abundant natural resources.

Technology

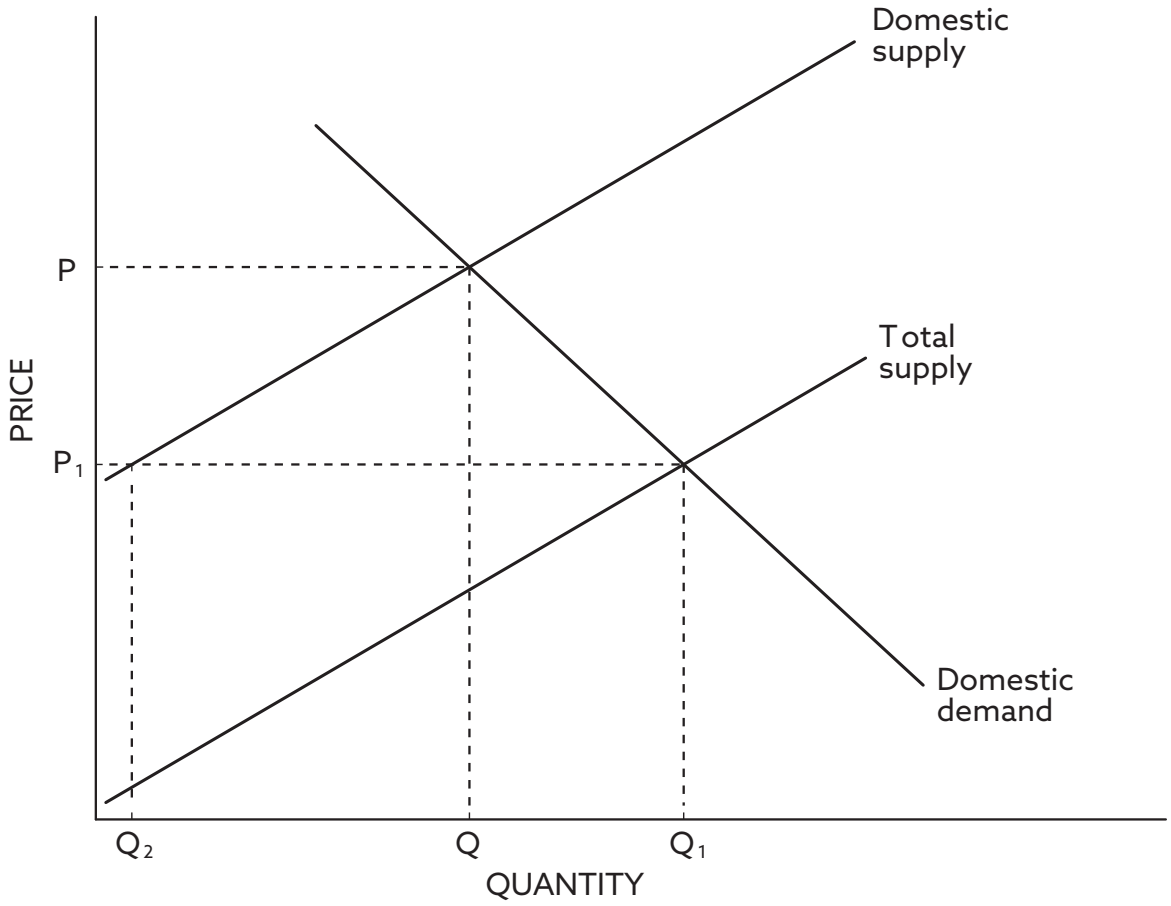
- The way that resources are combined to produce output.
  - A country with little technology may see that the best way to farm a crop is with a mule-drawn plow.
  - A country with better technology can also farm that crop but does it with enormous diesel-powered harvesters.

Economic Growth Graphs





Domestic Plus Foreign Supply



Why Does a Country Limit Trade?

Positive Consequences

- National Defense
- Protect Infant Industry
- Prevent Dumping and Preserve Fair Competition
- Preservation of Domestic Jobs
- Maintenance of a Diverse and Stable Economy
- Prevention of Exploitation

Negative Consequences

- Retaliation from Trading Partners
- Higher Prices for Consumers
- Reduced Access to Foreign Markets for Domestic Producers.

The Current Account (CA)

A record of all trade between nations. Includes:

- payments for imports and exports of both goods and services.
- monetary gifts or transfer payments to and from other nations.

This account is divided into three categories

- Balance on Goods and Services
- Net Investment Income
- Net Transfers

Capital and Financial Accounts (CFA)

Records the flow of money from the purchase and sale of real and financial assets.

- Real asset – purchase of a hotel building in Tokyo
- Financial asset – purchase of stock in a Swedish company

The Sale of Assets

- A financial asset creates a liability. Stocks and bonds are expected to pay interest and repay the principal in the future.
- This is the difference between the Current Account and the Capital and Financial Account. Current Accounts have no liabilities – when you sell wheat to Germany that is the end of the transaction.

Officials Reserves

- The foreign currency and securities held by the government, usually by its central bank:

  – is used to balance the payments from year to year.

  – is NOT a deficit in the overall account. It's part of the CFA.

Debit or Credit?

To classify a transaction, consider whether a country uses (loses) or earns (gains) foreign currency.

- If the international transaction uses foreign currency to complete the transaction, it is a debit (negative).
- If it earns foreign currency, it is a credit (positive).

Balance of Payment (BOP) Accounts

CA+CFA = 0

The Current Account plus the Capital and Financial Account must always sum to zero.

- The goods and services and financial assets we send out to the world must equal the goods/services/financial assets that we get back.
- Don't confuse this with a Trade Deficit.

Any transaction that happens in one account, the opposite must happen in the other account. For example, if the current account decreases by $1000, the Capital and Financial Account must increase by $1000.

Therefore -CA = CFA

Foreign Exchange Markets

- If we buy a good from another country, we must use that country's (domestic) currency. As a result, international trade requires that currencies also be traded.

- Currencies are traded in *foreign exchange markets*. The equilibrium price at which currencies are traded is called the **exchange rate**.

  – An ***exchange rate*** is the rate at which the currency of one country is exchanged for the currency of another.

- To find the exchange rate: divide the cost of the product in the foreign currency by the cost of the US Dollar in the foreign currency.

Appreciation and Depreciation

STRONG DOLLARS AND US GDP

An increase in the exchange rate – appreciation
When a currency appreciates – it strengthens
A "STRONG" dollar

If the US dollar appreciates,
US buys more foreign goods because they are cheaper
Foreign countries buy less US goods
Is "strong" good for US GDP?

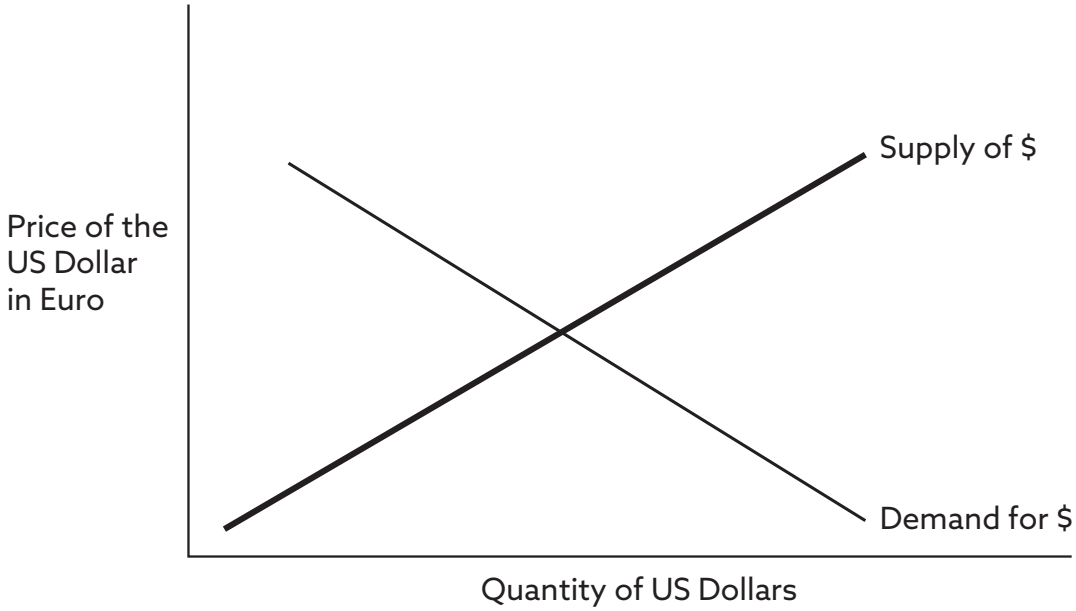
WEAK DOLLARS AND US GDP

A decrease in the exchange rate – depreciation
When a currency depreciates – it weakens
A "WEAK" dollar

If the US dollar depreciates,
Countries will buy more US goods because they are cheaper
US buys less foreign goods
Is "weak" good for US GDP?

Supply and Demand in the Foreign Exchange Market

Figure 6-4.1
FOREIGN EXCHANGE MARKET FOR US DOLLARS VS EUROS

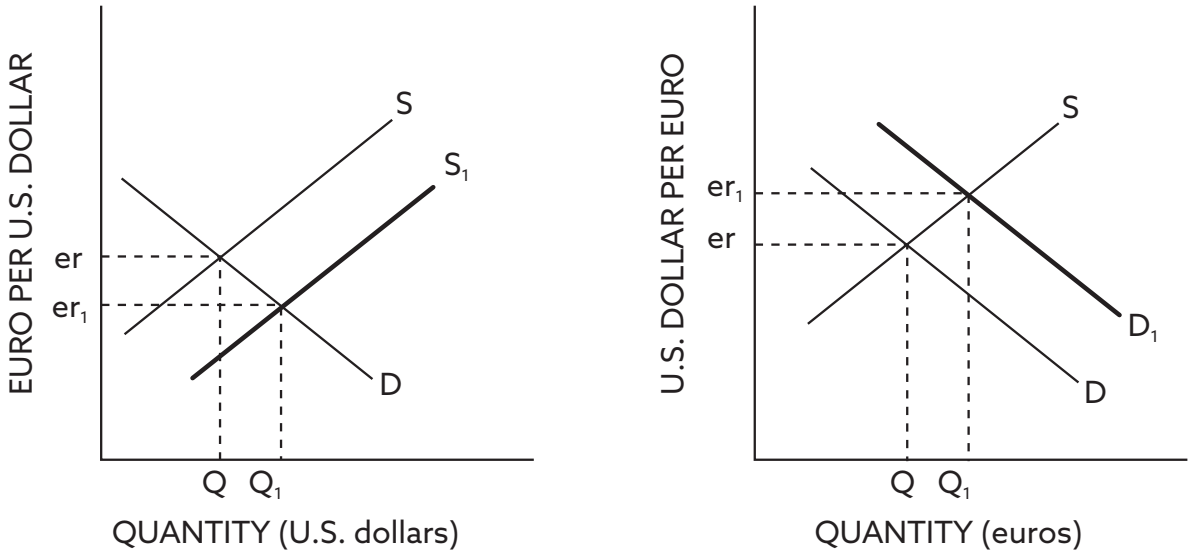


- The supply of U.S. dollars is determined by U.S. demand for foreign goods, services, and investments.
- The demand for U.S. dollars is determined by foreign demand for U.S. goods, services, and investments.

Graphing the Foreign Exchange Market

EXAMPLE: The prices of U.S. goods rise relative to the prices of German goods.

Figure 6-4.2
PRICES OF U.S. GOODS INCREASE



Why do the curves shift?

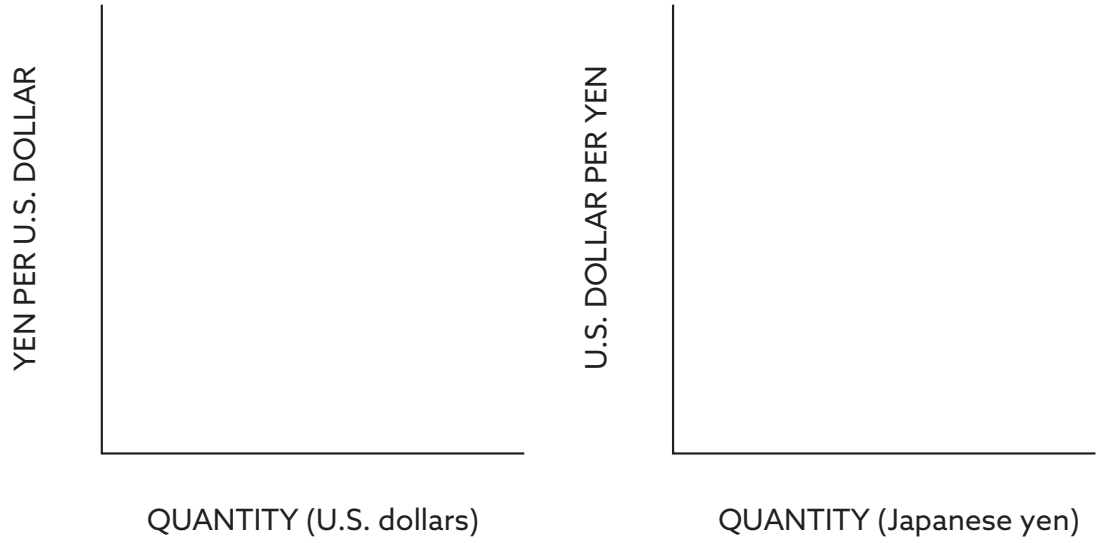
- The price of US goods rise so Americans will demand the less expensive German goods.
- To purchase the German goods, they need euros, so the demand for euros increases (shifts to the right) as shown in the market for euros.
- To buy euros, the Americans will supply U.S. dollars to the foreign exchange market, so the supply of U.S. dollars increases (shifts to the right) as shown in the market for U.S. dollars.
- The U.S. dollar depreciates (the exchange rate decreases; that is, the number of euros it takes to buy a U.S. dollar decreases).
- The euro appreciates (the exchange rate increases; that is, the number of U.S. dollars it takes to buy a euro increases).

Policies and Economic Conditions Affect Exchange Rates

Changes in a nation's monetary and fiscal policies affect its exchange rates and its balance of trade through the real interest rate, income, and the price level. Changes in the value of a country's currency affect the balance of trade, which affects aggregate demand. Changes in aggregate demand affect real output and the price level. In other words, domestic policies influence currency values, and currency values influence domestic policies. Policy makers cannot ignore the international effects of changes in monetary and fiscal policies.

For each scenario, show the effect on equilibrium exchange rate and quantity of currency in the foreign exchange market graphs in Figures 6-5.1 through 6-5.5. Use the graphs to show the starting equilibrium exchange rate and equilibrium quantity of currency, the shift that occurs, and the new equilibrium exchange rate and quantity. Following each set of graphs, indicate the short-run effect of the change in the foreign exchange market on net exports, aggregate demand, and the price level in the United States. (Ignore the effects on the financial account, that comes next.)

Figure 6-5.1
JAPAN'S REAL GDP INCREASES



1. Effect if Japan's real gross domestic product (GDP) increases:
   Rationale:

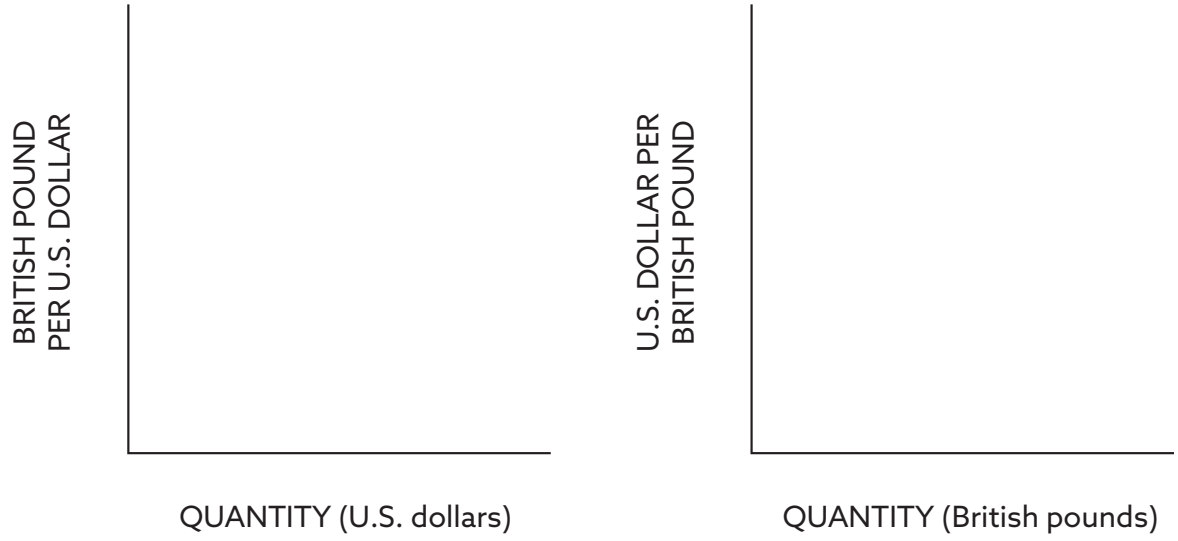
   (A) U.S. imports (increase/decrease). Explain.

(B) U.S. exports (increase/decrease). Explain.

(C) U.S. aggregate demand (increases/decreases). Explain.

(D) The price level in the United States (increases/decreases). Explain.

Figure 6-5.2
REAL INTEREST RATES IN THE UNITED STATES INCREASE RELATIVE TO GREAT BRITAIN



2. Effect if real interest rates in the United States increase relative to Great Britain:
   Rationale:

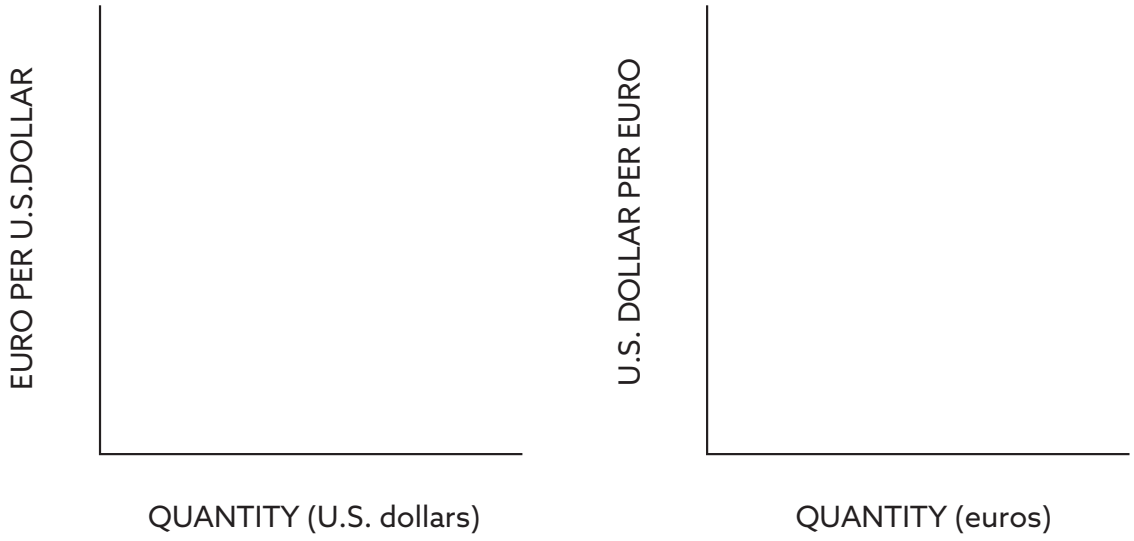
   (A) U.S. imports (increase/decrease). Explain.

   (B) U.S. exports (increase/decrease). Explain.

   (C) U.S. aggregate demand (increases/decreases). Explain.

   (D) The price level in the United States (increases/decreases). Explain.

Figure 6-5.3
EUROPE EXPERIENCES A RECESSION



3. Effect if Europe experiences a recession:
   Rationale:

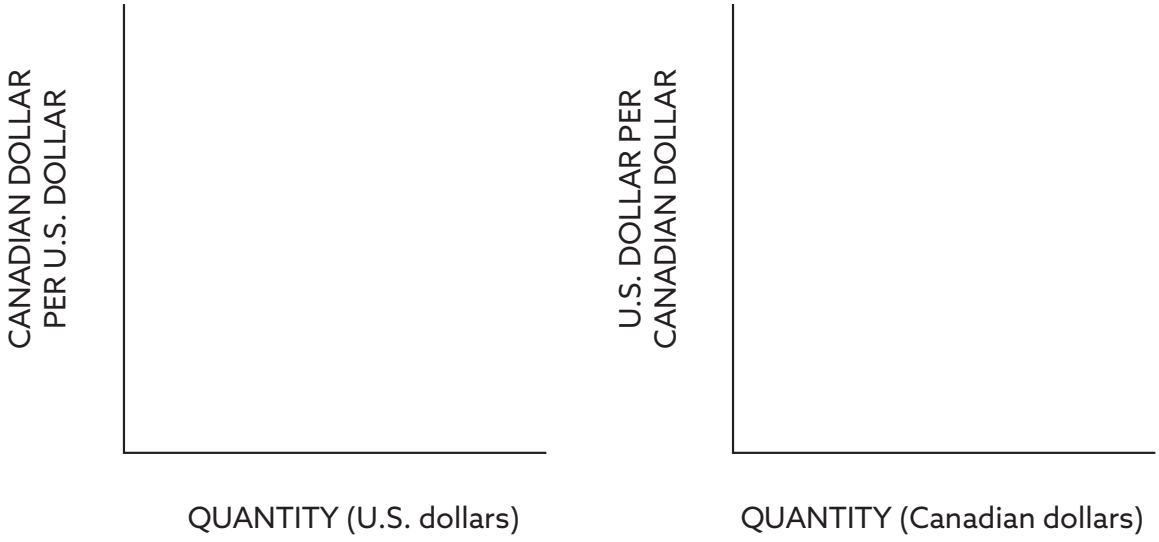
   (A) U.S. imports (increase/decrease). Explain.

   (B) U.S. exports (increase/decrease). Explain.

   (C) U.S. aggregate demand (increases/decreases). Explain.

   (D) The price level in the United States (increases/decreases). Explain.

Figure 6-5.4
THE PRICE LEVEL IN CANADA INCREASES RELATIVE TO THE UNITED STATES



4. Effect if the price level in Canada increases relative to the United States:
   Rationale:

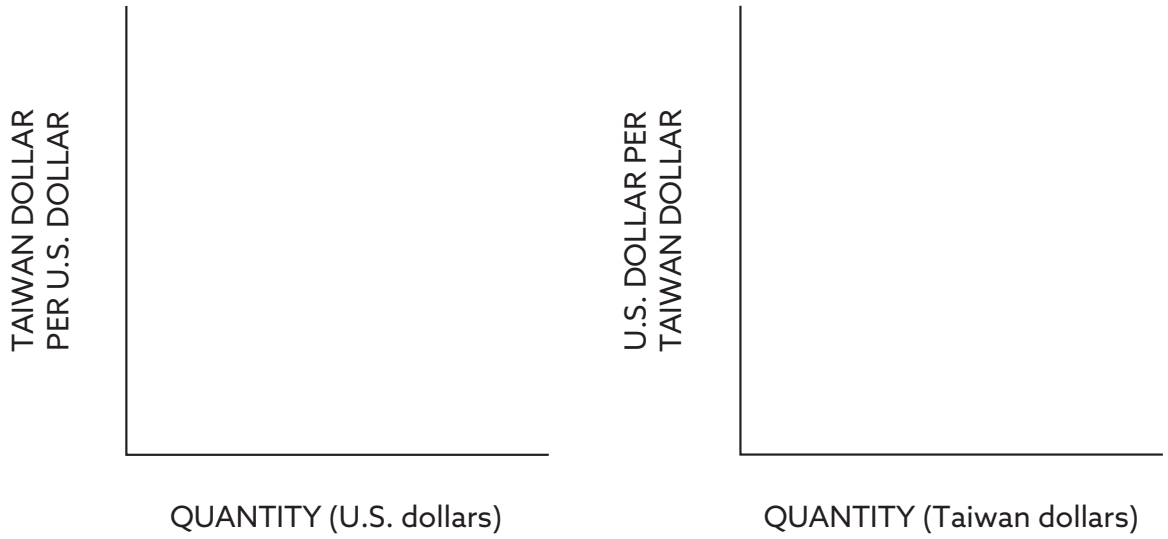
   (A) U.S. imports (increase/decrease). Explain.

   (B) U.S. exports (increase/decrease). Explain.

   (C) U.S. aggregate demand (increases/decreases). Explain.

   (D) The price level in the United States (increases/decreases). Explain.

Figure 6-5.5
EFFECT ON TAIWAN IF U.S. GOVERNMENT DECREASES TAXES



5. Effect on Taiwan if U.S. government decreases taxes:
   Rationale:

   (A) U.S. imports (increase/decrease). Explain.

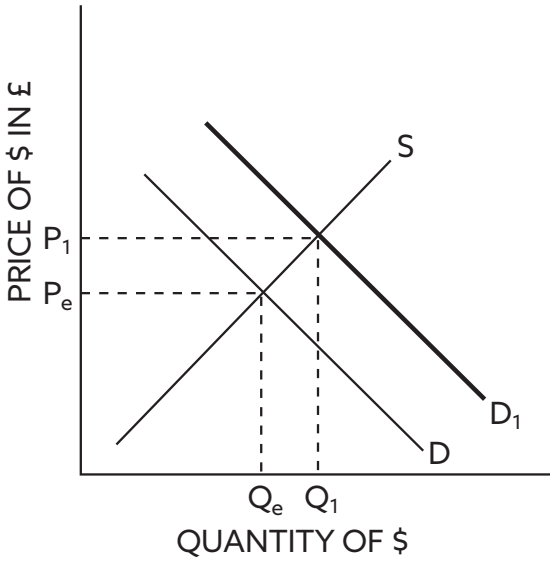
   (B) U.S. exports (increase/decrease). Explain.

   (C) U.S. aggregate demand (increases/decreases). Explain.

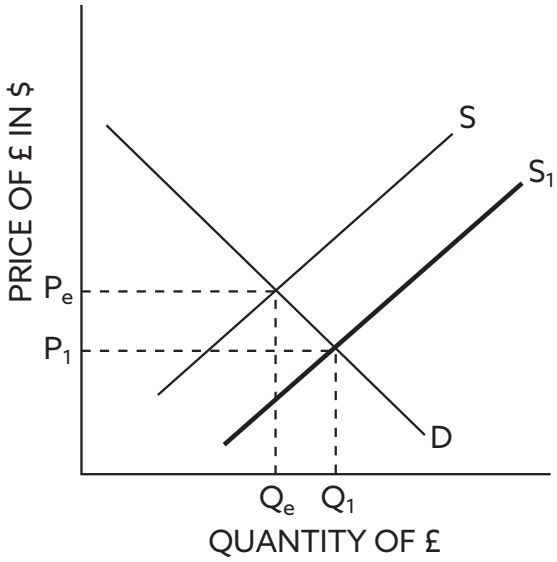
   (D) The price level in the United States (increases/decreases). Explain.

Foreign Exchange Market

US Dollars $



British Pounds £



Loanable Funds Market