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Instructor Answer and Solution Guide

Principles of

Macroeconomics

CHAPTER 1: WELCOME TO ECONOMICS!

Self-Check Questions

1. What is scarcity? Can you think of two causes of scarcity?

Solution: Scarcity means human wants for goods and services exceed the available supply. Supply is limited because resources are limited. Demand, however, is virtually unlimited. Whatever the supply, it seems human nature to want more.

2. Residents of the town of Smithfield like to consume hams, but each ham requires 10 people to produce it and takes a month. If the town has a total of 100 people, what is the maximum amount of ham the residents can consume in a month?

Solution: 100 people / 10 people per ham = a maximum of 10 hams per month if all residents produce ham. Since consumption is limited by production, the maximum number of hams residents could consume per month is 10.

3. A consultant works for $200 per hour. She likes to eat vegetables, but is not very good at it. Why does it make more economic sense for her to spend her time at the consulting job and shop for her vegetables?

Solution: She is very productive at her consulting job, but not very productive growing vegetables. Time spent consulting would produce far more income than it what she could save growing her vegetables using the same amount of time. So on purely economic grounds, it makes more sense for her to maximize her income by applying her labor to what she does best (i.e. specialization of labor).

4. A computer systems engineer could paint his house, but it makes more sense for him to hire a painter to do it. Explain why.

Solution: The engineer is better at computer science than at painting. Thus, his time is better spent working for pay at his job and paying a painter to paint his house. Of course, this assumes he does not paint his house for fun!

5. What would be another example of a "system" in the real world that could serve as a metaphor for micro and macroeconomics?

Solution: There are many physical systems that would work, for example, the study of planets (micro) in the solar system (macro), or solar systems (micro) in the galaxy (macro).

6. Suppose we extend the circular flow model to add imports and exports. Copy the circular flow diagram onto a sheet of paper and then add a foreign country as a third agent. Draw the flows of imports, exports, and the payments for each on your diagram.

Solution: Draw a box outside the original circular flow to represent the foreign country. Draw an arrow from the foreign country to firms, to represents imports. Draw an arrow in the reverse direction representing payments for imports. Draw an arrow from firms to the foreign country to represent exports. Draw an arrow in the reverse direction to represent payments for imports.

7. What is an example of a problem in the world today, not mentioned in the chapter, that has an economic dimension?

Solution: There are many such problems. Consider the AIDS epidemic. Why are so few AIDS patients in Africa and Southeast Asia treated with the same drugs that are effective in the United States and Europe? It is because neither those patients nor the countries in which they live have the resources to purchase the same drugs.

8. The chapter defines private enterprise as a characteristic of market-oriented economies. What would public enterprise be? Hint: It is a characteristic of command economies.

Solution: Public enterprise means the factors of production (resources and businesses) are owned and operated by the government.

9. Why might Belgium, France, Italy, and Sweden have a higher export to GDP ratio than the United States?

Solution: The United States is a large country economically speaking, so it has less need to trade internationally than the other countries mentioned. (This is the same reason that France and Italy have lower ratios than Belgium or Sweden.) One additional reason is that each of the other countries is a member of the European Union, where trade between members occurs without barriers to trade, like tariffs and quotas.

Review Questions

10. Give the three reasons that explain why the division of labor increases an economy's level of production.

Solution: First, division of labor allows for specialization, in which workers do what they do best, second, workers learn to be more efficient, and third, businesses can take advantage of economies of scale.

11. What are three reasons to study economics?

Solution: Economics factors into every major policy decision, economics encourages good citizenship, and economics makes for a well-rounded education.

12. What is the difference between microeconomics and macroeconomics?

Solution: Microeconomics focuses of individual actors within an economy, whereas macroeconomics focuses on the economy as a whole, or the sum of all individual actions.

13. What are examples of individual economic agents?

Solution: Individuals, households and businesses are all economic agents.

14. What are the three main goals of macroeconomics?

Solution: Growth in the standard of living, low unemployment and low inflation.

15. How did John Maynard Keynes define economics?

Solution: As a method of thinking that help people draw correct conclusions.

16. Are households primarily buyers or sellers in the goods and services market? In the labor market?

Solution: Households are primarily buyers in the goods and services market, as they use their income to purchase food, housing, education, transportation and many other items. Households are typically sellers in the labor market, offering their labor for a salary or hourly wage in order to earn a living.

17. Are firms primarily buyers or sellers in the goods and services market? In the labor market?

Solution: Firms are primarily sellers in the goods and services market, offering their wares to consumers. They are primarily buyers in the labor market, hiring employees to produce for them.

18. What are the three ways that societies can organize themselves economically?

Solution: As a command economy, a market economy, or a mixture of the two.

19. What is globalization? How do you think it might have affected the economy over the past decade?

Solution: Globalization is an increase in connections and economic activity across international lines. Globalization allows small economies to take fuller advantage of the division of labor.

Critical Thinking Questions

20. Suppose you have a team of two workers: one is a baker and one is a chef. Explain why the kitchen can produce more meals in a given period of time if each worker specializes in what they do best than if each worker tries to do everything from appetizer to dessert.

Solution: The baker and the chef have specialized skills that allow them to be more productive in certain areas than in others. The baker will be able to make a pie faster than the chef, and the chef will be better at cooking the main course. By each worker doing what he does best, productivity and efficiency are maximized and total output is greater.

21. Why would division of labor without trade not work?

Solution: With no trade, each individual must produce all the goods and services he wants to consume. Therefore, by definition, he cannot specialize and so he can obtain the benefits of specialization. With trade, on the other hand, by specializing on what the individual does best, he can maximize product and income and trade for whatever else he wants to consume. In short, specialization results in a net gain rather than a loss.

22. Can you think of any examples of *free* goods, that is, goods or services that are not scarce?

Solution: Air for breathing is, in most cases, not scarce. Of course, for the scuba diver or the astronaut, this is far from the case. Even goods that are not scarce for most practical purposes can become scarce under certain circumstances.

23. A balanced federal budget and a balance of trade are considered secondary goals of macroeconomics, while growth in the standard of living (for example) is considered a primary goal. Why do you think that is so?

Solution: A Balanced federal budget and the balance of trade do not have direct effects on the well-being of individuals. While we can argue about what their long term effects are, the standard of living (as measured by economic growth, for example) is directly responsible for how well off people are within an economy, so that is what economists care about.

24. Macroeconomics is an aggregate of what happens at the microeconomic level. Would it be possible for what happens at the macro level to differ from how economic agents would react to some stimulus at the micro level? *Hint:* Think about the behavior of crowds.

Solution: While the macroeconomy is ultimately the sum of individual actions, we can sometimes see a different result from collective action than we do for individual action. This can happen for a number of reasons, including crowd psychology, concentrated benefits and dispersed costs, and difficulties in coordination.

25. Why is it unfair or meaningless to criticize a theory as "unrealistic?"

Solution: Economic models and the accompanying theories typically employ simplifying assumptions that, by definition, make the models less than perfectly realistic. If the models are good ones, they are still useful for understanding how a system works, in the same way that a physicist might assume an absence of friction to simplify his understanding of how a ball rolls across a surface. By making models simple, we can understand the basic mechanisms of how things like supply and demand work without having to worry too much about all the real world complications

26. Suppose, as an economist, you are asked to analyze an issue unlike anything you have ever done before. Also, suppose you do not have a specific model for analyzing that issue. What should you do? *Hint:* What would a carpenter do in a similar situation?

Solution: In this situation, most economists would attempt to construct a model to describe the issue in question, using observation and reasonable assumptions. This model can then be applied to the problem to get a consistent answer.

27. Why do you think that most modern countries' economies are a mix of command and market types?

Solution: Markets have historically been very good at creating wealth and innovation, but the governments of most modern countries have decided that certain market outcomes, for extreme wealth inequality, are undesirable, and therefore intervene for the sake of what they view as fair or humane treatment of their citizens

28. Can you think of ways that globalization has helped you economically? Can you think of ways that it has not?

Solution: Some people may have benefitted from the inexpensive and diverse goods made available through global trade, while others may feel that they have lost jobs or opportunities due to competition from producers in foreign countries.

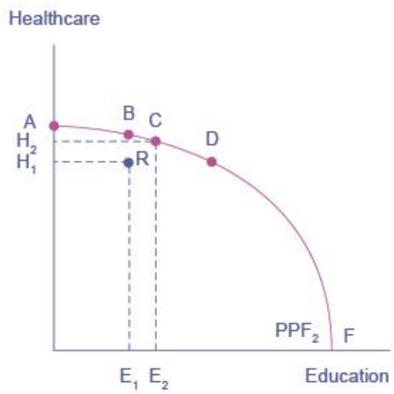
CHAPTER 2: CHOICE IN A WORLD OF SCARCITY

Self-Check Questions

1. **Suppose Alphonso's town raised the price of bus tickets to $1 per trip (while the price of burgers stayed at $2 and his budget remained $10 per week.) Draw Alphonso's new budget constraint. What happens to the opportunity cost of bus tickets?**

Solution: The opportunity cost of bus tickets is the number of burgers that must be given up to obtain one more bus ticket. Originally, when the price of bus tickets was 50 cents per trip, this opportunity cost was .50/2 = .25 burgers. The reason for this is that at the original prices, one burger ($2) costs the same as four bus tickets ($.50), so the opportunity cost of a burger is four bus tickets, and the opportunity cost of a bus ticket is .25 (the inverse of the opportunity cost of a burger). With the new, higher price of bus tickets, the opportunity cost rises to $1/$2 or .50. You can see this graphically since the slope of the new budget constraint is flatter than the original one. If Alphonso spends his entire budget on burgers, the higher price of bus tickets has no impact so the horizontal intercept of the budget constraint is the same. If he spends his entire budget on bus tickets, he can now afford only half as many, so the vertical intercept is half as much. In short, the budget constraint rotates clockwise around the horizontal intercept, flattening as it goes. Since the slope of the budget constraint reflects the opportunity cost of whatever good is on the vertical axis (in this case, bus tickets) the opportunity cost of bus tickets increases.

2. **Suppose there is an improvement in medical technology that enables more healthcare to be provided with the same amount of resources. How would this affect the production possibilities curve and, in particular, how would it affect the opportunity cost of education?**



Solution: Because of the improvement in technology, the vertical intercept of the PPF would be at a higher level of healthcare. In other words, the PPF would rotate clockwise around the horizontal intercept. This would make the PPF steeper, corresponding to an increase in the opportunity cost of education, since resources devoted to education would now mean forgoing a greater quantity of healthcare.

3. Could a nation be producing in a way that is allocatively efficient, but productively inefficient?

Solution: No. Allocative efficiency requires productive efficiency, because it pertains to choices along the production possibilities frontier.

4. What are the similarities between a consumer's budget constraint and society's production possibilities frontier, not just graphically but analytically?

Solution: Both the budget constraint and the PPF show the constraint that each operates under. Both show a tradeoff between having more of one good but less of the other. Both show the opportunity cost graphically as the slope of the constraint (budget or PPF).

5. Individuals may not act in the rational, calculating way described by the economic model of decision making, measuring utility and costs at the margin, but can you make a case that they behave approximately that way?

Solution: When individuals compare cost per unit in the grocery store, or characteristics of one product versus another, they are behaving approximately like the model describes.

6. Would an op-ed piece in a newspaper urging the adoption of a particular economic policy be considered a positive or normative statement?

Solution: Since an op-ed makes a case for what should be, it is considered normative.

7. Would a research study on the effects of soft drink consumption on children's cognitive development be considered a positive or normative statement?

Solution: Assuming that the study is not taking an explicit position about whether soft drink consumption is good or bad, but just reporting the science, it would be considered positive.

Review

8. Explain why scarcity leads to tradeoffs.

Solution: Since the supplies of virtually all goods are limited, and since human wants are unlimited, there is competition between individuals. If you want a certain good, you have to give up something else to get it, whether that be time, money, labor or another good offered in trade.

9. Explain why individuals make choices that are directly on the budget constraint, rather than inside the budget constraint or outside it.

Solution: A point inside the budget constraint indicates that the individual could have more of one good without have to give up any of the other. This is inefficient. A point outside the budget constraint is one that the individual cannot afford, as much as he might like to. The budget constraint line represents the set of all allocations of resources that are both efficient and possible.

10. What is comparative advantage?

Solution: Comparative advantage is when a country can produce a good at a lower cost in terms of other goods or when a country has a lower opportunity cost of production.

11. What does a production possibilities frontier illustrate?

Solution: The production possibilities frontier is the set of every combination of goods that is both possible and efficient to produce.

12. Why is a production possibilities frontier typically drawn as a curve, rather than a straight line?

Solution: Some inputs are better suited to one area of production than another. As these are diverted towards less efficient uses, some amount of production is lost, causing the PPF to bend.

13. Explain why societies cannot make a choice above their production possibilities frontier and should not make a choice below it.

Solution: A choice above the PPF is not possible because the PPF already illustrates the maximum amount of production. Producing at a point inside the PPF is inefficient because more production could be achieved at no additional cost.

14. What are diminishing marginal returns?

Solution: Diminishing marginal returns describe the decreased utility of additional units of a good or service. To take an extreme example, purchasing a haircut when you have not had one in a while is quite beneficial, but purchasing a second haircut on the same day is unlikely to yield very high utility.

15. What is productive efficiency? Allocative efficiency?

Solution: Productive efficiency means that it is impossible to produce more of one good without producing less of some other good. Allocative efficiency means that the combination of goods being produced represents the mix of goods most desired by society.

16. What is the difference between a positive and a normative statement?

Solution: A positive statement simply describes an actual result or situation. "If the government raises the minimum wage, some jobs will be lost" is a positive statement. A normative statement is a recommendation of a particular policy as either being a good or bad idea. "The government should raise the minimum wage" is a normative statement.

17. Is the economic model of decision-making intended as a literal description of how individuals, firms, and the governments actually make decisions?

Solution: No. Economic models use simplifying assumptions to help us understand complex systems. These are useful, but are not intended as a literal representation of actual behavior.

18. What are four responses to the claim that people should not behave in the way described in this chapter?

Solution: Economics describes behavior as it is, not as we would like it to be; Self-interest can be represented as personal choice and freedom; Self-interest results in economic efficiency, which ultimately leads to better standards of living; Self-interest does not imply that people are never charitable or selfless.

Critical Thinking Questions

19. Suppose Alphonso's town raises the price of bus tickets from $0.50 to $1 and the price of burgers rises from $2 to $4. Why is the opportunity cost of bus tickets unchanged? Suppose Alphonso's weekly spending money increases from $10 to $20. How is his budget constraint affected from all three changes? Explain.

Solution: The opportunity cost is defined as *the ratio* of the prices of the two goods. Since the price of both goods doubles, the ratio stays the same and the opportunity cost for Alphonso remains 1/4 of a burger to buy one bus ticket. Once his income doubles as well, his budget constraint is unchanged because in both cases he can still choose 5 burgers, 20 bus tickets or any combination in between.

20. During the Second World War, Germany's factories were decimated and suffered many human casualties, both soldiers and civilians. How did the war affect Germany's production possibilities curve?

Solution: Germany's PPF would have shifted inward, because the country's decrease in labor, capital and other inputs would reduce their ability to produce output at every allocation of resources.

21. It is clear that productive inefficiency is a waste since resources are being used in a way that produces less goods and services than a nation is capable of. Why is allocative inefficiency also wasteful?

Solution: Allocative inefficiency is wasteful because it means that a nation is producing goods that are not the most highly demanded. Not only does this result in goods piling up on store shelves, but it means that people have to pay higher prices for the relatively scarce goods they actually want.

22. What assumptions about the economy must be true for the invisible hand to work? To what extent are those assumptions valid in the real world?

Solution: The main assumptions behind the invisible hand are that people are rational, meaning they act in their own best interests, and that they have perfect information about the goods and services they buy. The first assumption is generally true except in the case of the seriously mentally ill. The second is rarely true in the real world.

23. Do economists have any particular expertise at making normative arguments? In other words, they have expertise at making positive statements (i.e., what will happen) about some economic policy, for example, but do they have special expertise to judge whether or not the policy *should* be undertaken?

Solution: In order to make a normative statement, there must be an underlying assumption about what the goal of the policy is, or what is right. A normative statement of sort "If your only goal is for fewer people to smoke, you should raise cigarette taxes" may be within an economist's realm of expertise, but typically these sorts of statements contain a moral component that lies outside the domain of economics.

Problems

Use this information to answer the following 4 questions: Marie has a weekly budget of $24, which she likes to spend on magazines and pies.

24. If the price of a magazine is $4 each, what is the maximum number of magazines she could buy in a week?

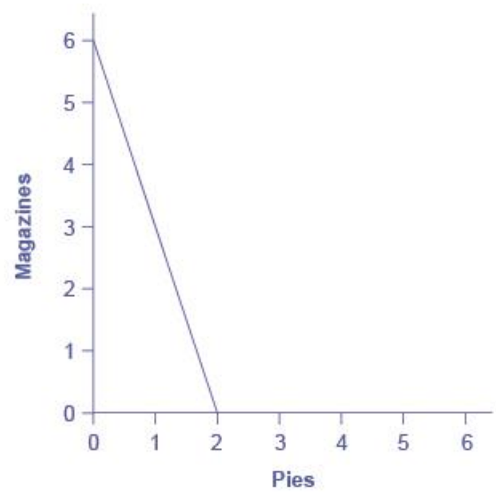
Solution: $24/$4 = 6 magazines.

25. If the price of a pie is $12, what is the maximum number of pies she could buy in a week?

Solution: $24/$12 = 2 pies.

26. Draw Marie's budget constraint with pies on the horizontal axis and magazines on the vertical axis. What is the slope of the budget constraint?

Solution: The slope is –3.



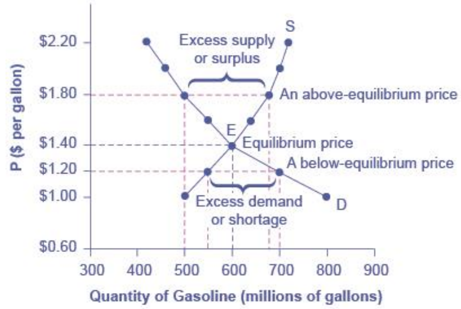
27. What is Marie's opportunity cost of purchasing a pie?

Solution: The opportunity cost of a pie is the (absolute value of the) slope of the budget line is 6/2 or 3 magazines.

CHAPTER 3: DEMAND AND SUPPLY

Self-Check Questions

1. **Review the following figure. Suppose the price of gasoline is $1.60 per gallon. What would happen to the quantity demanded? What would happen to the quantity supplied? Is the market in equilibrium, a shortage, or a surplus?**



Solution: Since $1.60 per gallon is above the equilibrium price, the quantity demanded would fall and the quantity supplied would rise. (These results are due to the laws of demand and supply, respectively.) The outcome of lower Qd and higher Qs would be a surplus in the gasoline market.

2. **Why do economists use the ceteris paribus assumption?**

Solution: To make it easier to analyze complex problems. Ceteris paribus allows you to look at the effect of one factor at a time on what it is you're trying to analyze. When you've analyzed all the factors individually, you add the results together to get the final answer. See the next two questions for examples of how this is done.

3. **In an analysis of the market for paint, an economist discovers the facts listed below. State whether each of these changes will affect supply or demand, and in what direction.**

a. There have recently been some important cost-saving inventions in the technology for making paint.
b. Paint is lasting longer, so that property owners need not repaint as often.
c. Because of severe hailstorms, many people need to repaint now.
d. The hailstorms damaged several factories that make paint, forcing them to close down for several months.

Solution:

a. An improvement in technology that reduces the cost of production will cause an increase in supply at any price. Alternatively, you can think of this as a reduction in price necessary for firms to supply any quantity. Either way, this can be shown as a rightward (or downward) shift in the supply curve.
b. An improvement in product quality is treated as an increase in tastes or preferences, meaning consumers will demand more paint at any price level, so demand in the present will increase or shift to the right. If this seems counterintuitive, note that demand in the future for the longer-lasting paint will fall, since consumers are essentially shifting demand from the future to the present.
c. An increase in need causes an increase in demand or a rightward shift in the demand curve.
d. Factory damage means that firms are unable to supply as much in the present. Technically, this is an increase in the cost of production. Either way you look at it, the supply curve shifts to the left.

4. Many changes are affecting the market for oil. Predict how each of the following events will affect the equilibrium price and quantity in the market for oil. In each case, sketch a supply and demand diagram to support your answer.

a. Cars are becoming more fuel efficient, and therefore get more miles to the gallon.
b. The winter is exceptionally cold.
c. A major discovery of new oil is made off the coast of Norway.
d. The economies of some major oil-using nations, like Japan, slow down.
e. A war in the Middle East disrupts oil-pumping schedules.
f. Landlords install additional insulation in buildings.
g. The price of solar energy falls dramatically.
h. Chemical companies invent a new, popular kind of plastic made from oil.

Solution

a. More fuel efficient cars means there is less need for gasoline. This causes a leftward shift in the demand for gasoline and thus oil. Since the demand curve is shifting down the supply curve, the equilibrium price and quantity both fall.
b. Cold weather increases the need for heating oil. This causes a rightward shift in the demand for heating oil and thus oil. Since the demand curve is shifting up the supply curve, the equilibrium price and quantity both rise.
c. A discovery of new oil will make oil more abundant. This can be shown as a rightward shift in the supply curve, which will cause a decrease in the equilibrium price along with an increase in the equilibrium quantity. (The supply curve shifts down the demand curve so price and quantity follow the law of demand. If price goes up, then the quantity goes down.)
d. When an economy slows down, it produces less output and demands fewer inputs, including energy, which is used in the production of virtually everything. A decrease in demand for energy will be reflected as a decrease in the demand for oil, or a leftward shift in demand for oil. Since the demand curve is shifting down the supply curve, both the equilibrium price and quantity of oil will fall.
e. Disruption of oil pumping will reduce the supply of oil. This leftward shift in the supply curve will show a movement up the demand curve, resulting in an increase in the equilibrium price of oil and a decrease in the equilibrium quantity.

f. Increased insulation will decrease the demand for heating. This leftward shift in the demand for oil causes a movement down the supply curve resulting in a decrease in the equilibrium price and quantity of oil.
g. Solar energy is a substitute for oil-based energy. So if solar energy becomes cheaper, the demand for oil will decrease as consumers switch from oil to solar. The decrease in demand for oil will be shown as a leftward shift in the demand curve. As the demand curve shifts down the supply curve, both equilibrium price and quantity for oil will fall.
h. A new, popular kind of plastic will increase the demand for oil. The increase in demand will be shown as a rightward shift in demand, raising the equilibrium price and quantity of oil.

5. Let's think about the market for air travel. From 2009 to 2012, the price of jet fuel increased roughly 84%. Using the four-step analysis, how do you think this fuel price increase affected the equilibrium price and quantity of air travel?

Solution:

Step 1: Draw the graph with the initial supply and demand curves. Label the initial equilibrium price and quantity.
Step 2: Did the economic event affect supply or demand? Jet fuel is a cost of producing air travel, so an increase in price affects supply.
Step 3: An increase in the price of jet fuel caused an increase in the cost of air travel. We show this as an upward or leftward shift in supply.
Step 4: A leftward shift in supply causes a movement up the demand curve, raising the equilibrium price of air travel and lowering the equilibrium quantity.

6. A tariff is a tax on imported goods. Suppose the U.S. government cuts the tariff on imported flat screen televisions. Using the four-step analysis, how do you think the tariff reduction will affect the equilibrium price and quantity of flat screen TVs?

Solution:

Step 1: Draw the graph with the initial supply and demand curves. Label the initial equilibrium price and quantity.
Step 2: Did the economic event affect supply or demand? A tariff is treated like a cost of production, so this affects supply.
Step 3: A tariff reduction is equivalent to a decrease in the cost of production, which we can show as a rightward (or downward) shift in supply.
Step 4: A rightward shift in supply causes a movement down the demand curve, lowering the equilibrium price and raising the equilibrium quantity.

7. What is the effect of a price ceiling on the quantity demanded of the product? What is the effect of a price ceiling on the quantity supplied? Why exactly does a price ceiling cause a shortage?

Solution: A price ceiling (which is below the equilibrium price) will cause the quantity demanded to rise and the quantity supplied to fall. This is why a price ceiling creates a shortage.

8. Does a price ceiling change the equilibrium price?

Solution: A price ceiling is just a legal restriction. Equilibrium is an economic condition. People may or may not obey the price ceiling, so the actual price may be at or above the price ceiling, but the price ceiling doesn't change the equilibrium price.

9. What would be the impact of imposing a price floor below the equilibrium price?

Solution: A price ceiling is a legal maximum price, but the market will choose the equilibrium price as long as the latter is below the former. In other words, a price floor below equilibrium will have no effect.

Review Questions

10. What determines the level of prices in a market?

Solution: Prices are determined by a combination of the level of demand for a good and how much of that good is being supplied.

11. What does a downward-sloping demand curve mean about how buyers in a market will react to a higher price?

Solution: A downward sloping demand curve means that buyers will demand less of a good the higher the price becomes.

12. Will demand curves have the same exact shape in all markets? If not, how will they differ? What does an upward-sloping supply curve mean about how sellers in a market will react to a higher price?

Solution: The shape of a demand curve will be different depending o the market and the nature of the good being demanded. An upward sloping supply curve means that sellers are willing to supply more goods at higher prices.

13. Will supply curves have the same shape in all markets? If not, how will they differ?

Solution: The shape of supply curves will differ based on how easy it is to vary the level of supply in response to a price change. For example, a natural resource of which there is a finite amount may have a very steep supply curve, because of the difficulty in increasing production.

14. What is the relationship between quantity demanded and quantity supplied at equilibrium? What is the relationship when there is a shortage? What is the relationship when there is a surplus?

Solution: At equilibrium, quantity demanded and quantity supplied are equal to one another. In a shortage, quantity demanded exceeds quantity supplied. In a surplus, quantity supplied exceeds quantity demanded.

15. How can you locate the equilibrium point on a demand and supply graph?

Solution: The equilibrium is the point where the demand curve and the supply curve cross.

16. If the price is above the equilibrium level, would you predict excess supply or excess demand? If the price is below the equilibrium level, would you predict a shortage or a surplus? Why?

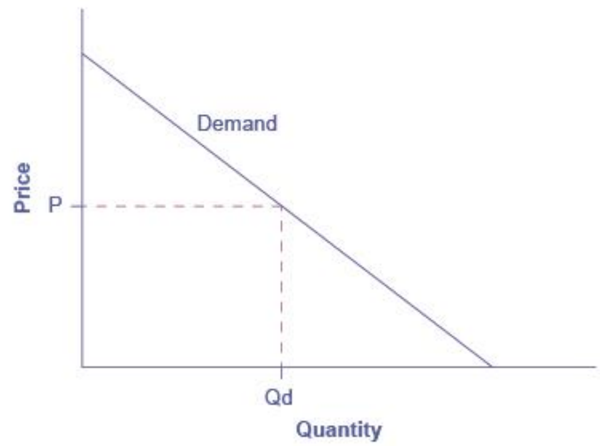
Solution: If the price is above the equilibrium level, there will be excess supply known as a surplus. If the price is below the equilibrium level, there will be excess demand, known as a shortage. This happens because the number of people who want to buy the good is not equal to the number of people who want to sell it at the given price.

17. When the price is above the equilibrium, explain how market forces move the market price to equilibrium. Do the same when the price is below the equilibrium.

Solution: When price is above the equilibrium, there will be more sellers than buyers and the surplus goods will start to pile up. The only way for sellers to get rid of their excess goods is to lower prices. Conversely, if the price is too low, there will be more buyers than sellers, and those who demand the good will be willing to offer higher prices for them.

18. What is the difference between the demand and the quantity demanded of a product, say milk? Explain in words and show the difference on a graph with a demand curve for milk.

Solution: Demand describes consumers' willingness to buy a good at any price. Demand is shown by the position of a demand curve, in other words, how far away from the origin it is. Quantity demanded refers to how much will be purchased at a single, specific price, that is, at one point on the demand curve.



19. What is the difference between the supply and the quantity supplied of a product, say milk? Explain in words and show the difference on a graph with the supply curve for milk.

Solution: Supply describes producers' willingness to sell at any price. Supply is shown by the position of a supply curve, in other words, how far away from the origin it is. Quantity supplied refers to how much will be sold at a single, specific price, that is, at one point on the supply curve.

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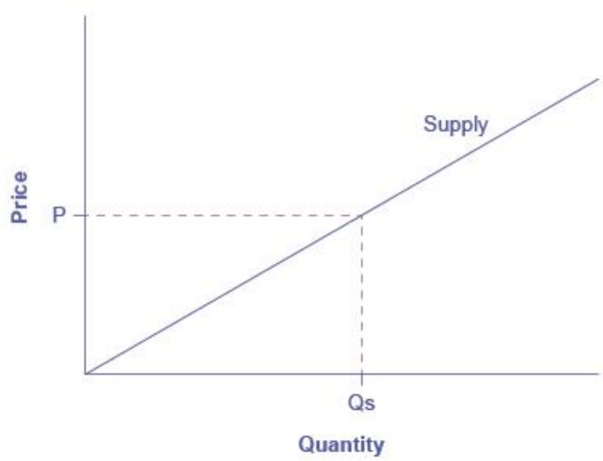


20. When analyzing a market, how do economists deal with the problem that many factors that affect the market are changing at the same time?

Solution: Economists try to isolate one variable to study at a time, holding all other factors constant. This can be challenging in the real world, but is useful in economic models.

21. Name some factors that can cause a shift in the demand curve in markets for goods and services.

Solution: Changes in the wealth of consumers, such as in a recession or economic boom, can shift the demand curve. Changes in prices of substitute and complement goods can also have an effect.

22. Name some factors that can cause a shift in the supply curve in markets for goods and services.

Solution: Supply shocks such as natural disasters can shift the supply curve. Changes in technology or the price of inputs can also have an effect.

23. How does one analyze a market where both demand and supply shift?

Solution: When both demand and supply shift, they will generally have opposite effects on either quantity or price. In this case it is necessary to know the magnitude of the changes in order to analyze them.

24. What causes a movement along the demand curve? What causes a movement along the supply curve?

Solution: A change in the price received by sellers will cause a movement along the supply curve. A change in the price demanded by buyers will cause a movement along the demand curve.

25. Does a price ceiling attempt to make a price higher or lower?

Solution: A price ceiling prevents the price from rising above a certain level, keeping prices low.

26. How does a price ceiling set below the equilibrium level affect quantity demanded and quantity supplied?

Solution: A price ceiling set below the equilibrium price will result in a greater quantity demanded than the quantity supplied otherwise known as a shortage.

27. Does a price floor attempt to make a price higher or lower?

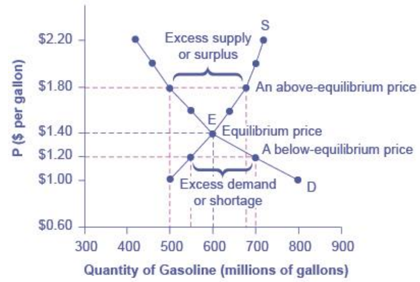
Solution: A price floor prevents the price from rising below a certain level, keeping prices high.

28. How does a price floor set above the equilibrium level affect quantity demanded and quantity supplied?

Solution: A price floor set above the equilibrium level results in a greater quantity supplied than the quantity demanded, otherwise known as a surplus.

Critical Thinking Questions

29. Review the following figure. Suppose the government decided that, since gasoline is a necessity, its price should be legally capped at $1.30 per gallon. What do you anticipate would be the outcome in the gasoline market?



Solution: There would be a shortage of gasoline. At such a low price, consumers would be very eager to buy, but producers would see limited profit opportunities. The quantity demanded would therefore exceed the quantity supplied by the market.

30. Explain why the following statement is false: "In the goods market, no buyer would be willing to pay more than the equilibrium price."

Solution: The equilibrium price merely equalizes the number of willing sellers and buyers. There would still be people willing to buy even if the price were to rise.

31. Explain why the following statement is false: In the goods market, no seller would be willing to sell for less than the equilibrium price."

Solution: The equilibrium price merely equalizes the number of willing sellers and buyers. There would still be people willing to sell even if the price were to fall.

32. Consider the demand for hamburgers. If the price of a substitute good (e.g., hot dogs) increases and the price of a complement good (e.g., hamburger buns) increases, can you tell for sure what will happen to the demand for hamburgers? Why or why not?

Solution: Without more information, we cannot say what will happen to the demand for hamburgers. The increase in the price of hot dogs will increase the demand for hamburgers, but the increase in the price of hamburger buns will have the opposite effect. Only by knowing the magnitude of each effect can we say for sure what will happen.

33. How do you suppose the demographics of an aging population of "Baby Boomers" in the United States will affect the demand for milk? Justify your answer.

Solution: Assuming that milk is primarily consumed by children, an aging population will probably see a reduction in demand as Baby Boomers stop having children.

34. We know that a change in the price of a product causes a movement along the demand curve. Suppose consumers believe that prices will be rising in the future. How will that affect demand for the product in the present? Can you show this graphically?

Solution: An anticipated price increase will cause the demand curve to shift to the right, an increase in demand, as consumers try to take advantage of what they believe to be temporarily low prices.

35. Suppose there is soda tax to curb obesity. What should a reduction in the soda tax do to the supply of sodas and to the equilibrium price and quantity? Can you show this graphically? (Hint: assume that the soda tax is collected from the sellers)

Solution: A reduction in the soda tax means that sellers receive a higher price for each soda sold. This will increase the supply of sodas.

36. Use the four-step process to analyze the impact of the advent of the iPod (or other portable digital music players) on the equilibrium price and quantity of the Sony Walkman (or other portable audio cassette players).

Solution:

Draw the graph of the initial supply and demand curves.
Does the introduction of the iPod cause a shift in supply or demand for Walkmans?
Since the iPod is a consumer good, the change will be in demand
Since the iPod is a substitute for a Walkman, the demand curve will shift left.
A leftward shift in the demand curve will cause the price and quantity to fall.

37. Use the four-step process to analyze the impact of a reduction in tariffs on imports of iPods on the equilibrium price and quantity of Sony Walkman-type products.

Solution:

Draw the graph of the initial supply and demand curves.
Does the change affect demand or supply? Since tariffs affect the price consumers pay, the effect will be on demand.
The reduction in the price of iPods causes a leftward shift in demand for the substitute good, the Walkman.
The leftward shift in demand for Walkmans would cause a reduction in price and quantity sold.

38. Suppose both of these events took place at the same time. Combine your analyses of the impacts of the iPod and the tariff reduction to determine the likely impact on the equilibrium price and quantity of Sony Walkman-type products. Show your answer graphically.

Solution: Both effects shift demand for Walkmans in the same direction and both result in a lower price and lower quantity at equilibrium

39. Most government policy decisions have winners and losers. What are the effects of raising the minimum wage? It is more complex than simply producers lose and workers gain. Who are the winners and who are the losers, and what exactly do they win and lose? To what extent does the policy change achieve its goals?

Solution: The minimum wage is a price floor that prevents the price of labor from falling below a certain level. Like all binding price floors, this creates a surplus of labor, also known as unemployment. Those who do not offer enough productive value to earn the minimum wage will lose out on job opportunities they might otherwise have had. On the other hand, those who do manage to keep their jobs will benefit from higher wages. In this way, minimum wages make some workers better off, but actually harm those with the least education or skills, who cannot compete for jobs at the higher wage level.

40. Agricultural price supports result in government holding large inventories of agricultural products. Why do you think the government can't simply give the products away to poor people?

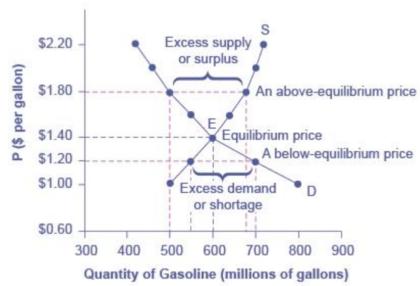
Solution: If the government gave away these agricultural holdings, the recipients would then have no incentive to buy the goods from producers, demand would contract and prices would fall, exactly what the policy is trying to prevent. There would also be nothing stopping the poor from selling the products given to them by the government. This would be an increase of supply and be accompanied by a drop in prices.

41. Can you propose a policy that would induce the market to supply more rental housing units?

Solution: A reduction in property taxes would make it cheaper for landlords to own houses and rent them out, resulting in an increase in supply.

Problems

42. Review the following figure. Suppose the price of gasoline is $1.00. Will the quantity demanded be lower or higher than at the equilibrium price of $1.40 per gallon? Will the quantity supplied lower or higher? Is there a shortage or a surplus in the market? If so, of how much?



Solution: The quantity demanded will be higher than at the equilibrium price and the quantity supplied will be lower, resulting in a shortage of 300 million gallons.

43. The following table shows information on the demand and supply for bicycles, where the quantities of bicycles are measured in thousands.

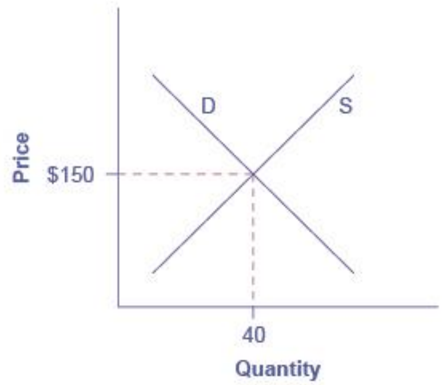
Price	**Qd**	**Qs**
$120	50	36
$150	40	40
$180	32	48
$210	28	56
$240	24	70

a. **What is the quantity demanded and the quantity supplied at a price of $210?**
b. **At what price is the quantity supplied equal to 48,000?**
c. **Graph the demand and supply curve for bicycles. How can you determine the equilibrium price and quantity from the graph? How can you determine the equilibrium price and quantity from the table? What are the equilibrium price and equilibrium quantity?**
d. **If the price was $120, what would the quantities demanded and supplied be? Would a shortage or surplus exist? If so, how large would the shortage or surplus be?**

Solution:

a. Quantity demanded is 28,000 and quantity supplied is 56,000.
b. At $180.
c. The equilibrium price is $150, and the equilibrium quantity is 40,000. You can see this from

the table by where quantity demanded is equal to quantity supplied, and you can see it on the graph where the supply and demand curves cross.

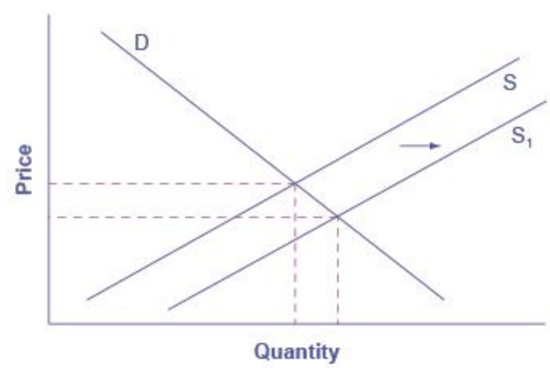


d. At $120, the quantity demanded is 50,000 and the quantity supplied is 36,000. The result would be a shortage of 14,000 bicycles.

44. The computer market in recent years has seen many more computers sell at much lower prices. What shift in demand or supply is most likely to explain this outcome? Sketch a demand and supply diagram and explain your reasoning.

a. A rise in demand
b. A fall in demand
c. A rise in supply
d. A fall in supply

Solution: c) For prices to fall while the quantity sold rises, supply must have increased. This is shown graphically by a rightward shift in the supply curve.



45. Demand and supply in the market for cheddar cheese is illustrated in the table below. Graph the data and find the equilibrium. Next, create a table showing the change in quantity demanded or quantity supplied, and a graph of the new equilibrium, in each of the following situations:

a. The price of milk, a key input for cheese production, rises, so that the supply decreases by 80 pounds at every price.
b. **A new study says that eating cheese is good for your health, so that demand increases by 20% at every price.**

Price per Pound	**Qd**	**Qs**
$3.00	750	540
$3.20	700	600

$3.40	**650**	**650**
$3.60	620	700
$3.80	600	720
$4.00	590	730

Solution:

a. The new equilibrium price would be $3.60 and the new equilibrium quantity would be 620.
b. The new equilibrium price would be $3.80 and the new equilibrium quantity would be 720.

Price per Pound	Qd	Qs
$3.00	750	460
$3.20	700	520
$3.40	650	570
$3.60	620	620
$3.80	600	640
$4.00	590	650
Price per Pound	**Qd**	**Qs**
$3.00	900	540
$3.20	840	600
$3.40	780	650
$3.60	744	700
$3.80	720	720
$4.00	708	730

46. Supply and demand for movie tickets in a city are shown in the following table. Graph demand and supply and identify the equilibrium. Then calculate in a table and graph the effect of the following two changes.

a. Three new nightclubs open. They offer decent bands and have no cover charge, but make their money by selling food and drink. As a result, demand for movie tickets falls by six units at every price.

b. The city eliminates a tax that it had been placing on all local entertainment businesses. The result is that the quantity supplied of movies at any given price increases by 10%.

Price	Qd	Qs
$5.00	26	16
$6,00	24	18
$7.00	22	20
$8.00	21	21
$9.00	20	22

Solution:

a. The new equilibrium price would be $6.00 and the new equilibrium quantity would be 18.
b. The new equilibrium price would be $7.00 and the new equilibrium quantity would be 22.

Price	**Qd**	**Qs**
$5.00	20	16
$6,00	**18**	**18**
$7.00	16	20
$8.00	15	21
$9.00	14	22
Price	**Qd**	**Qs**
$5.00	26	17.6
$6,00	24	19.8
$7.00	**22**	**22**
$8.00	21	23.1
$9.00	20	24.2

47. A low-income country decides to set a price ceiling on bread so they can make sure that bread is affordable to the poor. The conditions of demand and supply are given in the table below. What are the equilibrium price and equilibrium quantity before the price ceiling? What will the excess demand or the shortage (that is, quantity demanded minus quantity supplied) be if the price ceiling is set at $2.40? At $2.00? At $3.60?

Price	**Qd**	**Qs**
$1.60	9,000	5,000
$2.00	8,500	5,500
$2.40	8,000	6,400
$2.80	**7,500**	**7,500**
$3.20	7,000	9,000
$3.60	6,500	11,000
$4.00	6,000	15,000

Solution: The equilibrium price is $2.80 and the equilibrium quantity is 7,500. A price ceiling of $2.40 would create a shortage of 1,600. A price ceiling of $2.00 would create a shortage of 3,000. A price ceiling of $3.60 would have no effect since it is above the market equilibrium.

CHAPTER 4: LABOR AND FINANCIAL MARKETS

Self-Check Questions

1. **In the labor market, what causes a movement along the demand curve? What causes a shift in the demand curve?**

Solution: Changes in the wage rate (the price of labor) cause a movement along the demand curve. A change in anything else that affects demand for labor (e.g., changes in output, changes in the production process which use more or less labor, government regulation) causes a shift in the demand curve.

2. **In the labor market, what causes a movement along the supply curve? What causes a shift in the supply curve?**

Solution: Changes in the wage rate (the price of labor) cause a movement along the supply curve. A change in anything else that affects supply of labor (e.g., changes in how desirable the job is perceived to be, government policy to promote training in the field) causes a shift in the supply curve.

3. **Why is a living wage considered a price floor? Does imposing a living wage have the same outcome as a minimum wage?**

Solution: Since a living wage is a suggested minimum wage, it acts like a price floor (assuming, of course, that it is followed). If the living wage is binding, it will cause an excess supply of labor at that wage rate.

4. **In the financial market, what causes a movement along the demand curve? What causes a shift in the demand curve?**

Solution: Changes in the interest rate (i.e., the price of financial capital) cause a movement along the demand curve. A change in anything else (non-price variable) that affects demand for financial capital (e.g., changes in confidence about the future, changes in needs for borrowing) would shift the demand curve.

5. **In the financial market, what causes a movement along the supply curve? What causes a shift in the supply curve?**

Solution: Changes in the interest rate (i.e., the price of financial capital) cause a movement along the supply curve. A change in anything else that affects the supply of financial capital (a non-price variable) such as income or future needs would shift the supply curve.

6. **If a usury law limits interest rates to no more than 35%, what would the likely impact be on the amount of loans made and interest rates paid?**

Solution: If market interest rates stay in their normal range, an interest rate limit of 35% would not be binding. If the equilibrium interest rate rose above 35%, the interest rate would be capped at that rate, and the quantity of loans would be lower than the equilibrium quantity, causing a shortage of loans.

7. Which of the following changes in the financial market will lead to a decline in interest rates:

a. a rise in demand
b. a fall in demand
c. a rise in supply
d. a fall in supply

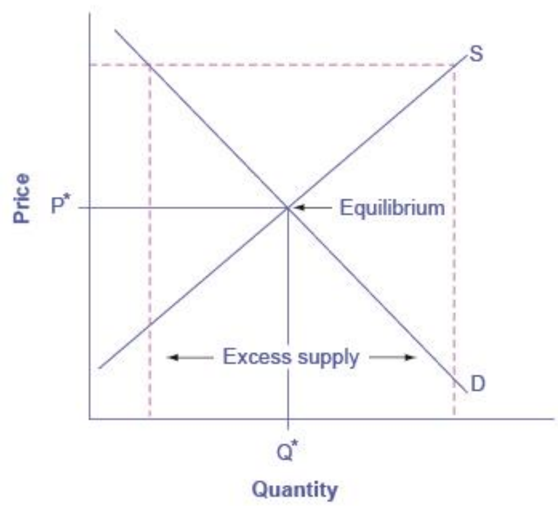
Solution: b) and c) will lead to a fall in interest rates. At a lower demand, lenders will not be able to charge as much, and with more available lenders, competition for borrowers will drive rates down.

8. Which of the following changes in the financial market will lead to an increase in the quantity of loans made and received:
a. a rise in demand
b. a fall in demand
c. a rise in supply
d. a fall in supply

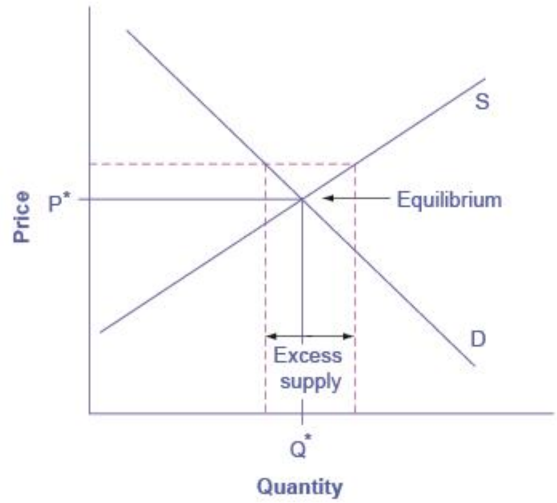
Solution: a) and c) will increase the quantity of loans. More people who want to borrow will result in more loans being given, as will more people who want to lend.

9. Identify the most accurate statement. A price floor will have the largest effect if it is set:
a. substantially above the equilibrium price
b. slightly above the equilibrium price
c. slightly below the equilibrium price
d. substantially below the equilibrium price
Sketch all four of these possibilities on a demand and supply diagram to illustrate your answer.

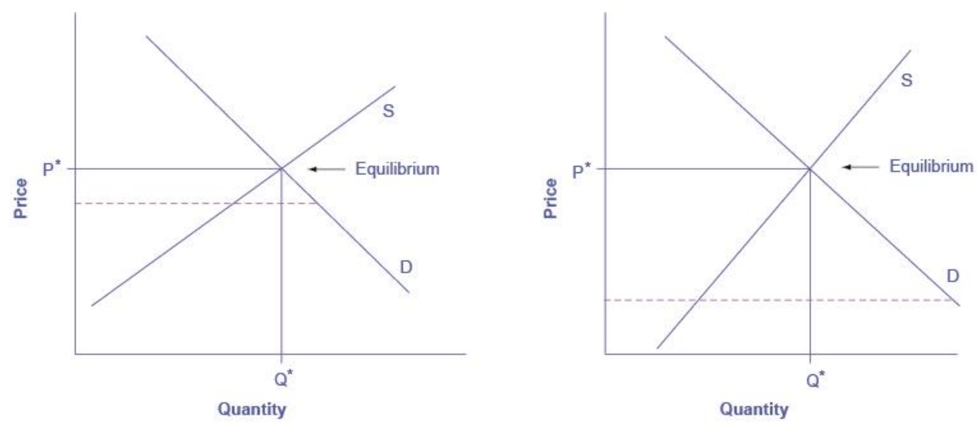
Solution: A price floor prevents a price from falling below a certain level, but has no effect on prices above that level. It will have its biggest effect in creating excess supply if it is substantially above the equilibrium price. This is illustrated here.



It will have a lesser effect if it is slightly above the equilibrium price. This is illustrated below.



It will have no effect if it is set either slightly or substantially below the equilibrium price, since an equilibrium price above a price floor will not be affected by that price floor. This figure illustrates these situations.



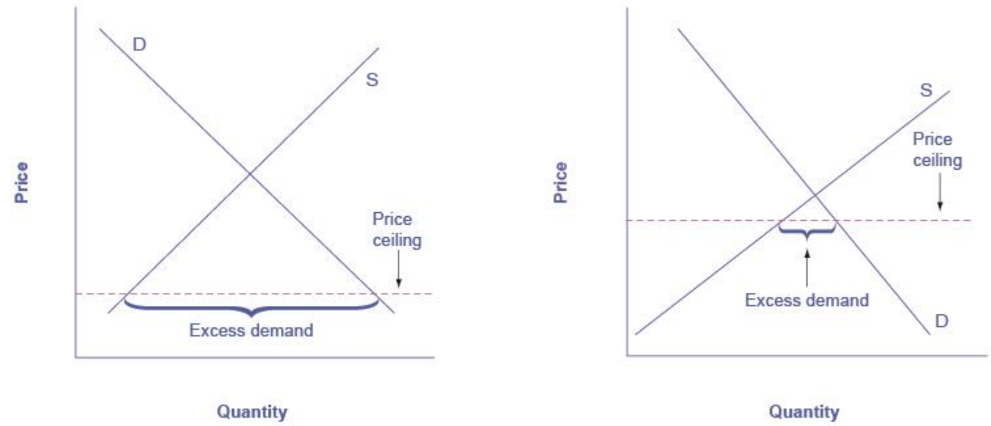
(a) Price floor slightly below equilibrium price (b) Price floor substantially below equilibrium price

10. A price ceiling will have the largest effect:

- **a. substantially below the equilibrium price**
- **b. slightly below the equilibrium price**
- **c. substantially above the equilibrium price**
- **d. slightly above the equilibrium price**

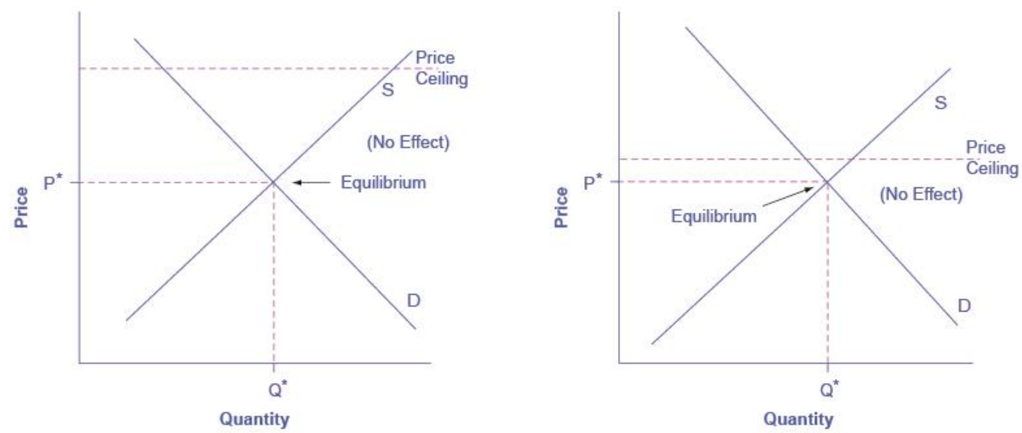
Sketch all four of these possibilities on a demand and supply diagram to illustrate your answer.

Solution: A price ceiling prevents a price from rising above a certain level, but has no effect on prices below that level. It will have its biggest effect in creating excess demand if it is substantially below the equilibrium price. The figure below illustrates these situations.



(a) Price ceiling substantially below equilibrium price (b) Price ceiling slightly below equilibrium price

When the price ceiling is set substantially or slightly above the equilibrium price, it will have no effect on creating excess demand. This figure illustrates these situations.



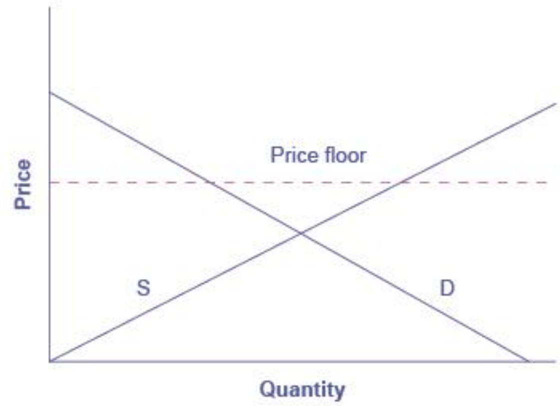
(a) Price ceiling substantially above equilibrium price (b) Price ceiling slightly above equilibrium price

11. Select the correct answer. A price floor will usually shift:

- **a. demand**
- **b. supply**
- **c. both**
- **d. neither**

Illustrate your answer with a diagram.

Solution: d) Neither. A shift in demand or supply means that at every price, either a greater or a lower quantity is demanded or supplied. A price floor does not shift a demand curve or a supply curve. However, if the price floor is set above the equilibrium, it will cause the quantity supplied on the supply curve to be greater than the quantity demanded on the demand curve, leading to excess supply.



12. Select the correct answer. A price ceiling will usually shift:

- **a. demand**
- **b. supply**
- **c. both**
- **d. neither**

Solution: d) Neither. A shift in demand or supply means that at every price, either a greater or a lower quantity is demanded or supplied. A price ceiling does not shift a demand curve or a supply curve. However, if the price ceiling is set below the equilibrium, it will cause the quantity demanded on the demand curve to be greater than the quantity supplied on the supply curve, leading to excess demand.

Review Questions

13. What is the "price" commonly called in the labor market?

Solution: In labor markets, price is typically called a "wage."

14. Are households demanders or suppliers in the goods market? Are firms demanders or suppliers in the goods market? What about the labor market and the financial market?

Solution: Households demand goods and supply labor, whereas firms supply goods and demand labor.

15. Name some factors that can cause a shift in the demand curve in labor markets.

Solution: Recessions and expansions in the economy can cause a shift in the demand for labor, as can changes in the price of capital (a substitute) and new production technologies.

16. Name some factors that can cause a shift in the supply curve in labor markets.

Solution: Supply shocks such as wars and natural disasters which decrease population can shift supply, as can sudden population influxes, such as from immigration.

17. How is equilibrium defined in financial markets?

Solution: Equilibrium is where the quantity of loanable funds demanded equals the quantity supplied.

18. What would be a sign of a shortage in financial markets?

Solution: When people want to borrow money, but are unable to find a willing lender.

19. Would usury laws help or hinder resolution of a shortage in financial markets?

Solution: Usury laws make lending less profitable, so they would hinder resolution of a shortage.

20. Whether the product market or the labor market, what happens to the equilibrium price and quantity for each of the four possibilities: increase in demand, decrease in demand, increase in supply, and decrease in supply.

Solution: An increase in demand leads to a higher price and a higher quantity; a decrease in demand leads to a lower price and lower quantity; an increase in supply leads to a lower price and a higher quantity; a decrease in supply leads to a higher price and a lower quantity.

Critical Thinking Questions

21. Other than the demand for labor, what would be another example of a "derived demand?"

Solution: Demand for the raw materials involved in production, such as steel or lumber, can be examples of "derived demand."

22. Suppose that a 5% increase in the minimum wage causes a 5% reduction in employment. How would this affect employers and how would it affect workers? In your opinion, would this be a good policy?

Solution: Employers would have to make do with fewer workers, which they might do by reducing output or substituting towards more capital use. The employees would enjoy higher wages and therefore have more money to demand goods, but the resulting unemployed would experience the opposite effect.

23. What assumption is made for a minimum wage to be a nonbinding price floor? What assumption is made for a living wage price floor to be binding?

Solution: For a minimum wage to be nonbinding, it must be set below the equilibrium wage. For the living wage price floor to be binding, it must be set above the equilibrium wage.

24. Suppose the U.S. economy began to grow more rapidly than other countries in the world. What would be the likely impact on U.S. financial markets as part of the global economy?

Solution: The quantity of loanable funds would increase, resulting in lower interest rates and more borrowing from other countries.

25. If the government imposed a federal interest rate ceiling of 20% on all loans, who would gain and who would lose?

Solution: Borrowers would gain, as the amount of debt that could accrue was limited, and lenders would lose and their loans became less profitable.

26. Why are the factors that shift the demand for a product different from the factors that shift the demand for labor? Why are the factors that shift the supply of a product different from those that shift the supply of labor?

Solution: Goods and labor are supplied and demanded by different economic agents, so the factors that affect them are different. Goods are typically demanded by households and supplied by firms, whereas labor is supplied by households and demanded by firms.

27. During a discussion several years ago on building a pipeline to Alaska to carry natural gas, the U.S. Senate passed a bill stipulating that there should be a guaranteed minimum price for the natural gas that would be carried through the pipeline. The thinking behind the bill was that if private firms had a guaranteed price for their natural gas, they would be more willing to drill for gas and to pay to build the pipeline

a. **Using the demand and supply framework, predict the effects of this price floor on the price, quantity demanded, and quantity supplied.**
b. **With the enactment of this price floor for natural gas, what are some of the likely unintended consequences in the market?**
c. **Suggest some policies other than the price floor, working within the framework of demand and supply that the government can pursue if it wishes to encourage drilling for natural gas and for a new pipeline in Alaska.**

Solution:

a. The price floor would result in more natural gas being supplied than the quantity demanded.
b. There would be a surplus of natural gas, with firms producing more than consumers would be willing to buy at the mandated price.
c. Policies that directly affect supply and demand are more efficient than price floors. For example, the government could shift investment away from public transportation and ethanol towards technologies that rely more heavily on natural gas to stimulate demand, or the government could stimulate supply by offering subsidies to producers.

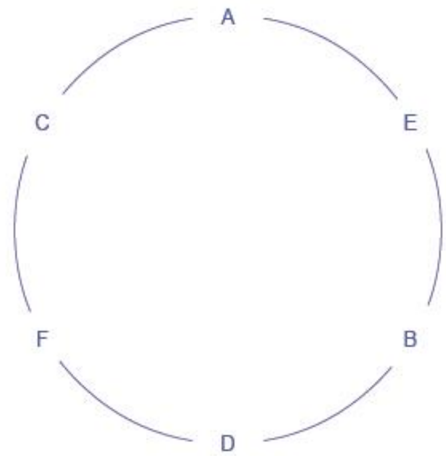
Problems

28. Identify each of the following as involving either demand or supply. Draw a circular flow diagram and label the flows A through F. (Some choices can be on both sides of the goods market.)

a. **Households in the labor market**
b. **Firms in the goods market**
c. **Firms in the financial market**
d. **Households in the goods market**
e. **Firms in the labor market**
f. **Households in the financial market**

Solution

a. Supply
b. Supply
c. Demand
d. Demand
e. Demand
f. Supply (and sometimes demand too)

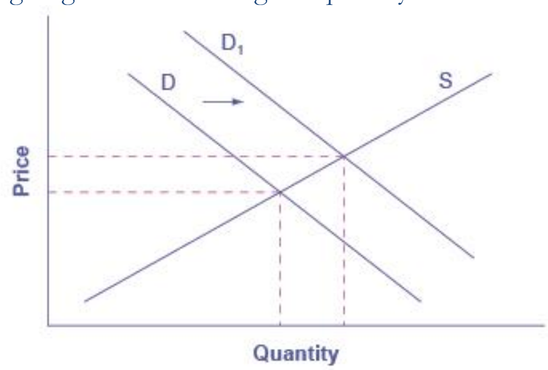


29. **Predict how each of the following events will raise or lower the equilibrium wage and quantity of coal miners in West Virginia. In each case, sketch a demand and supply diagram to illustrate your answer.**

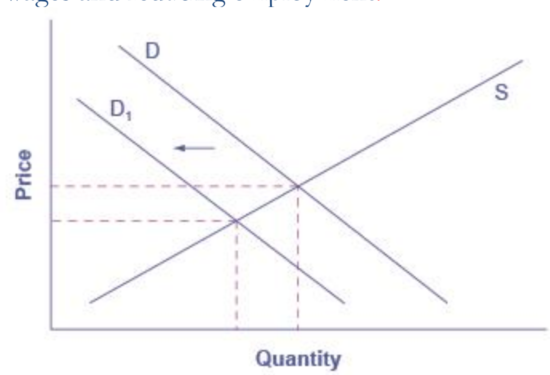
- **a. The price of oil rises.**
- **b. New coal-mining equipment is invented that is cheap and requires few workers to run.**
- **c. Several major companies that do not mine coal open factories in West Virginia, offering a lot of well-paid jobs.**
- **d. Government imposes costly new regulations to make coal-mining a safer job.**

Solution:

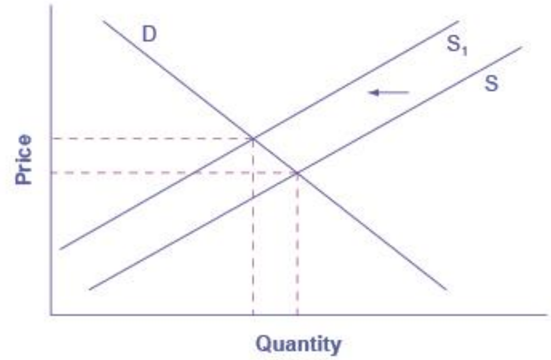
a. Since oil is a substitute for coal, and increase in the price of oil will shift the demand curve right, increasing wages and increasing the quantity of coal miners employed.



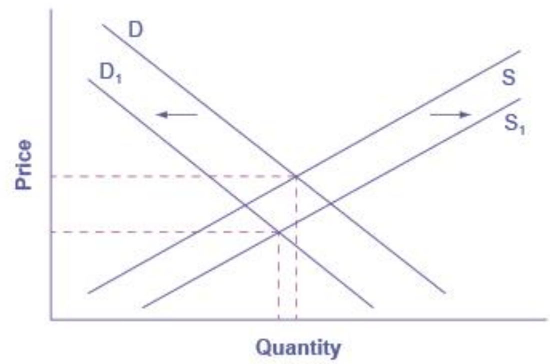
b. Coal mining equipment is a substitute for labor, so the demand curve for coal miners shifts left, reducing wages and reducing employment.



c. The availability of new factory jobs, should shifts the supply curve for coal miners left, increasing wages and reducing the quantity of jobs mining.



d. Mandated expenditures on safety reduce the demand for labor, shifting the demand curve left, reducing wages and reducing quantity. However, since coal mining is safer, this may also cause an increase in the supply of miners as well, shifting supply to the right. The combination of both effects will reduce wages, but the effect on employment is indeterminate.

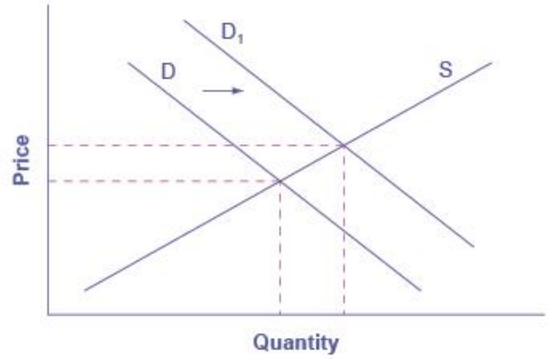


30. Predict how each of the following economic changes will affect the equilibrium price and quantity in the financial market for home loans. Sketch a demand and supply diagram to support your answers.

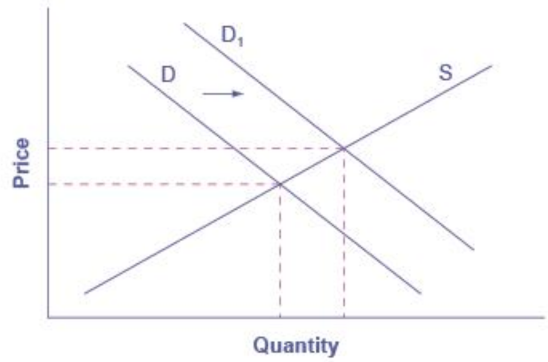
a. The number of people at the most common ages for home-buying increases.
b. People gain confidence that the economy is growing and that their jobs are secure.
c. Banks that have made home loans find that a larger number of people than they expected are not repaying those loans.
d. Because of a threat of a war, people become uncertain about their economic future.
e. The overall level of saving in the economy diminishes.
f. The federal government changes its bank regulations in a way that makes it cheaper and easier for banks to make home loans.

Solution:

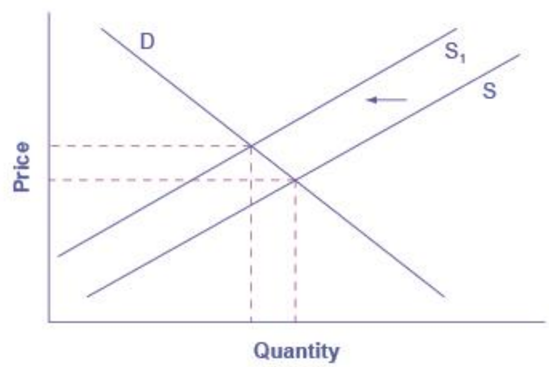
a. The demand curve shifts right, increasing interest rates and increasing quantity of loans



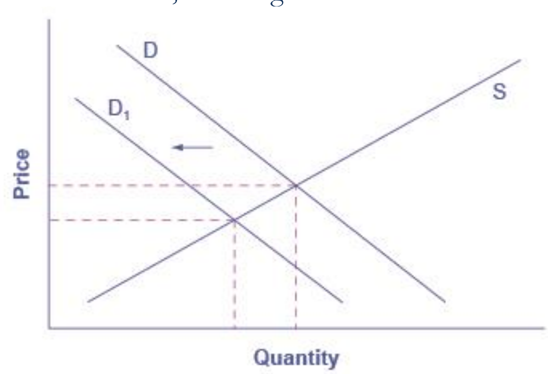
b. The demand curve shifts right, increasing interest rates and increasing quantity of loans



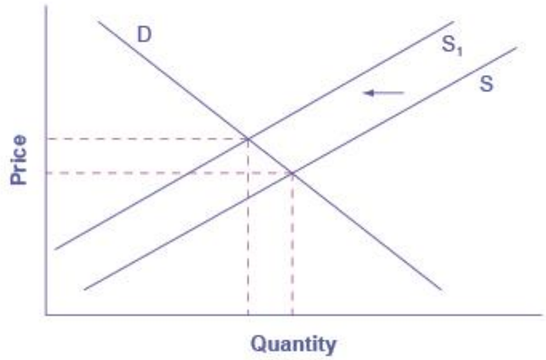
c. The supply curve shifts left, increasing interest rates and reducing quantity of loans



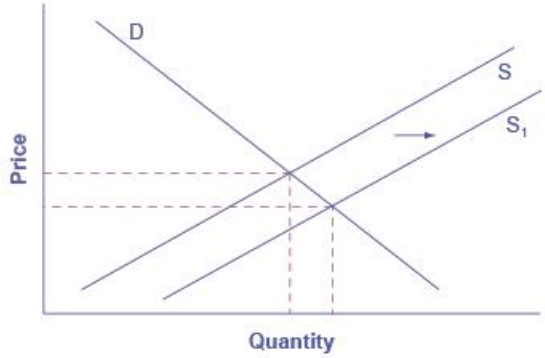
d. The demand curve shifts left, reducing interest rates and reducing quantity of loans



e. The supply curve shifts left, increasing interest rates and reducing quantity of loans



f. The supply curve shifts right, reducing interest rates and increasing quantity of loans



31. The table shows the amount of savings and borrowing in a market for loans to purchase homes, measured in millions of dollars, at various interest rates. What is the equilibrium interest rate and quantity in the capital financial market? How can you tell? Now, imagine that because of a shift in the perceptions of foreign investors, the supply curve shifts so that there will be $10 million less supplied at every interest rate. Calculate the new equilibrium interest rate and quantity, and explain why the direction of the interest rate shift makes intuitive sense.

Interest rate	**Quantity supplied**	**Quantity demanded**
5%	**130**	**170**
6%	**135**	**150**
7%	**140**	**140**
8%	**145**	**135**
9%	**150**	**125**
10%	**155**	**110**

Solution: The equilibrium interest rate occurs where the quantity of borrowing equals the quantity of lending, here $140 million. The equilibrium interest rate is therefore 7%.

With $10 million less supplied at every interest rate, we see that 145 - 10 = 135. Thus, the new equilibrium interest rate is 8%. The interest rate has risen because there is now less money to go around for the same number of potential borrowers.

32. Imagine that to preserve the traditional way of life in small fishing villages, a government decides to impose a price floor that will guarantee all fishermen a certain price for their catch.

a. Using the demand and supply framework, predict the effects on the price, quantity demanded, and quantity supplied.

b. With the enactment of this price floor for fish, what are some of the likely unintended consequences in the market?

c. Suggest some policies other than the price floor, working within the framework of demand and supply, to make it possible for small fishing villages to continue.

Solution:

a. The price floor, if it is binding, will increase prices, which will result in a higher quantity supplied and a lower quantity demanded.

b. We are likely to see a surplus of fish, as fishermen are more willing to supply them at the mandated price than consumers are willing to buy them.

c. A better policy would be to stimulate demand for fish, which would result in higher prices without the inefficiencies of a surplus. This could be done through advertising, or by arranging exclusive contracts for the government to buy from the fishing villages. Alternatively, the fishermen could be offered wage subsidies to increase the effective price they receive for their fish without raising the price to consumers

33. What happens to the price and the quantity bought and sold in the cocoa market if countries producing cocoa experience a drought and a new study is released demonstrating the health benefits of cocoa? Illustrate your answer with a demand and supply graph.

Solution: The drought is a supply shock that will reduce the supply of cocoa, whereas the health study will increase demand. Both of these shifts will result in higher prices, but they have opposite effects on the quantity produced and sold. Without knowing the magnitudes of the effects, we cannot say for sure what happens to the equilibrium quantity.

CHAPTER 5: ELASTICITY

Self-Check Questions

1. **From the data shown in the table below about demand for smart phones, calculate the price elasticity of demand from: point B to point C, point D to point E, and point G to point H. Classify the elasticity at each point as elastic, inelastic or unit elastic.**

Points	P	Q
A	60	3,000
B	70	2,800
C	80	2,600
D	90	2,400
E	100	2,200
F	110	2,000
G	120	1,800
H	130	1,600

Solution: From point B to point C, prices rise from $70 to $80, and Od decreases from 2,800 to 2,600. So:

$$\begin{aligned}\text{\% change in quantity} &= \frac{2600-2800}{(2600+2800)\div 2}\times 100\\ &= \frac{-200}{2700}\times 100\\ &= -7.41\\ \text{\% change in price} &= \frac{80-70}{(80+70)\div 2}\times 100\\ &= \frac{10}{75}\times 100\\ &= 13.33\\ \text{Elasticity of Demand} &= \frac{-7.41\%}{13.33\%}\\ &= \left|-0.56\right|\end{aligned}$$

The demand curve is highly inelastic in this area; that is, its elasticity value is less than one.

Answer from Point D to point E:

$$\% \text{ change in quantity} = \frac{2200-2400}{(2200+2400)\div 2}\times 100$$
$$= \frac{-200}{2300}\times 100$$
$$= -8.7$$
$$\% \text{ change in price} = \frac{100-90}{(100+90)\div 2}\times 100$$
$$= \frac{10}{95}\times 100$$
$$= 10.53$$
$$\text{Elasticity of Demand} = \frac{-8.7\%}{10.53\%}$$
$$= |-0.83|$$

The demand curve is highly inelastic in this area; that is, its elasticity value is less than one. Answer from Point G to point H:

$$\% \text{ change in quantity} = \frac{1600-1800}{(1600+1800)\div 2}\times 100$$
$$= \frac{-200}{1700}\times 100$$
$$= -11.76$$
$$\% \text{ change in price} = \frac{130-120}{(130+120)\div 2}\times 100$$
$$= \frac{10}{75}\times 100$$
$$= 13.33$$
$$\text{Elasticity of Demand} = \frac{-11.76\%}{13.33\%}$$
$$= |-0.88|$$

The demand curve is approaching unit elasticity.

2. From the data shown in Table 05_03 about supply of alarm clocks, calculate the price elasticity of supply from: point J to point K, point L to point M, and point N to point P. Classify the elasticity at each point as elastic, inelastic, or unit elastic.

Point	Price	Quantity Supplied
J	**$8**	**50**
K	**$9**	**70**
L	**$10**	**80**
M	**$11**	**88**
N	**$12**	**95**
P	**$13**	**100**

Solution: From point J to point K, price rises from $8 to $9, and quantity rises from 50 to 70. So:

$$\begin{aligned}\text{\% change in quantity} &= \frac{70-50}{(70+50)\div 2}\times 100\\ &= \frac{20}{60}\times 100\\ &= 33.33\end{aligned}$$

$$\begin{aligned}\text{\% change in price} &= \frac{\$9-\$8}{(\$9+\$8)\div 2}\times 100\\ &= \frac{1}{8.5}\times 100\\ &= 11.76\end{aligned}$$

$$\begin{aligned}\text{Elasticity of Supply} &= \frac{33.33\%}{11.76\%}\\ &= |2.83|\end{aligned}$$

The supply curve is highly elastic in this area; that is, its elasticity value is greater than one. From point L to point M, the price rises from \$10 to \$11, while the Qs rises from 80 to 88:

$$\begin{aligned}\text{\% change in quantity} &= \frac{88-80}{(88+80)\div 2}\times 100\\ &= \frac{8}{84}\times 100\\ &= 9.52\end{aligned}$$

$$\begin{aligned}\text{\% change in price} &= \frac{\$11-\$10}{(\$11+\$10)\div 2}\times 100\\ &= \frac{1}{10.5}\times 100\\ &= 9.52\end{aligned}$$

$$\begin{aligned}\text{Elasticity of Supply} &= \frac{9.52\%}{9.52\%}\\ &= |1.0|\end{aligned}$$

The supply curve has unitary elasticity in this area. From point N to point P, the price rises from \$12 to \$13, and Qs rises from 95 to 100:

$$\begin{aligned}\text{\% change in quantity} &= \frac{100-95}{(100+95)\div 2}\times 100\\ &= \frac{5}{97.5}\times 100\\ &= 5.13\end{aligned}$$

$$\begin{aligned}\text{\% change in price} &= \frac{\$13-\$12}{(\$13+\$12)\div 2}\times 100\\ &= \frac{1}{12.5}\times 100\\ &= 8.0\end{aligned}$$

$$\begin{aligned}\text{Elasticity of Supply} &= \frac{5.13\%}{8.0\%}\\ &= |0.64|\end{aligned}$$

The supply curve is inelastic in this region of the supply curve.

3. Why is the demand curve with constant unit elasticity concave?

Solution: The demand curve with constant unit elasticity is concave because at high prices, a one percent decrease in price results in more than a one percent increase in quantity. As we move down the demand curve, price drops and the one percent decrease causes less than a one percent increase in quantity.

4. Why is the supply curve with constant unit elasticity a straight line?

Solution: The constant unit elasticity is a straight line because the curve slopes upward and both price and quantity are increasing proportionally.

5. The federal government decides to require that automobile manufacturers install new anti-pollution equipment that costs $2,000 per car. Under what conditions can carmakers pass almost all of this cost along to car buyers? Under what conditions can carmakers pass very little of this cost along to car buyers?

Solution: Carmakers can pass this cost along to consumers if the demand for these cars is inelastic. If the demand for these cars is elastic, then the manufacturer must pay for the equipment.

6. Suppose you are in charge of sales at a pharmaceutical company, and your firm has a new drug that causes bald men to grow hair. Assume that the company wants to earn as much revenue as possible from this drug. If the elasticity of demand for your company's product at the current price is 1.4, would you advise the company to raise the price, lower the price, or to keep the price the same? What if the elasticity were 0.6? What if it were 1? Explain your answer.

Solution: If the elasticity is 1.4 at current prices, you would advise the company to lower its price on the product, since a decrease in price will be offset by the increase in the amount of the drug sold. If the elasticity were 0.6, then you would advise the company to increase its price. Increases in price will offset the decrease in number of units sold, but increase your total revenue. If elasticity is 1, the total revenue is already maximized, and you would advise that the company maintain its current price level.

7. What would the gasoline price elasticity of supply mean to UPS or FedEx?

Solution: The percentage change in quantity supplied as a result of a given percentage change in the price of gasoline.

8. The average annual income rises from $25,000 to $38,000, and the quantity of bread consumed in a year by the average person falls from 30 loaves to 22 loaves. What is the income elasticity of bread consumption? Is bread a normal or an inferior good?

Solution:

Percentage change in quantity demanded = [(change in quantity)/ (original quantity)] ×100
= [22 – 30]/ [(22 + 30) / 2] × 100
= –8/26 ×100
= –30.77
Percentage change in income = [(change in income)/ (original income)] ×100
= [38,000 – 25,000] / [(38,000 + 25,000) / 2] × 100
= 13/36.5 ×100
= 36
In this example, bread is an inferior good because its consumption falls as income rises.

9. Suppose the cross-price elasticity of apples with respect to the price of oranges is 0.4, and the price of oranges falls by 3%. What will happen to the demand for apples?

Solution: The formula for cross-price elasticity is % change in Qd for apples / % change in P of oranges. Multiplying both sides by % change in P of oranges yields:
% change in Qd for apples = cross-price elasticity X% change in P of oranges
= 0.4 × (-3%) = -1.2%, or a 1.2 % decrease in demand for apples.

Review Questions

10. What is the formula for calculating elasticity?

Solution: Elasticity is calculated by dividing the percent change in quantity over the percent change in price. $E = \%\Delta Q/\%\Delta P$

11. What is the price elasticity of demand? Can you explain it in your own words?

Solution: The price elasticity of demand is the extent to which quantity demanded responds to a change in price.

12. What is the price elasticity of supply? Can you explain it in your own words?

Solution: The price elasticity of supply is the extent to which quantity supplied responds to a change in price.

13. Describe the general appearance of a demand or a supply curve with zero elasticity.

Solution: A vertical line, since quantity will not change at all in response to a change in price.

14. Describe the general appearance of a demand or a supply curve with infinite elasticity.

Solution: A horizontal line, since as much of the product as desired can be sold or bought at a single price.

15. If demand is elastic, will shifts in supply have a larger effect on equilibrium quantity or on price?

Solution: On quantity.

16. If demand is inelastic, will shifts in supply have a larger effect on equilibrium price or on quantity?

Solution: On price.

17. If supply is elastic, will shifts in demand have a larger effect on equilibrium quantity or on price?

Solution: On quantity.

18. If supply is inelastic, will shifts in demand have a larger effect on equilibrium price or on quantity?

Solution: On price.

19. Would you usually expect elasticity of demand or supply to be higher in the short run or in the long run? Why?

Solution: We should expect demand to be more elastic in the short run, since it takes time to vary production to supply more or less of a good. However, in the long run supply is likely to be more elastic, as producers have a potentially unlimited ability to vary supply with prices.

20. Under which circumstances does the tax burden fall entirely on consumers?

Solution: For the tax burden to fall entirely on consumers, the supply curve must be perfectly elastic. Graphically, the supply curve must be horizontal.

21. What is the formula for the income elasticity of demand?

Solution: The percent change in quantity demanded over the percent change in income. $E = \%\Delta Q/\%\Delta I$

22. What is the formula for the cross-price elasticity of demand?

Solution: The percent change in quantity demanded over the percent change in the price of the substitute or complement good. $E = \%\Delta Q/\%\Delta Ps$ or $\%\Delta Q/\%\Delta Pc$

23. What is the formula for the wage elasticity of labor supply?

Solution: The percent change in the quantity of labor supplied over the percent change i the wage rate. $E = \%\Delta Q/\%\Delta W$

24. What is the formula for elasticity of savings with respect to interest rates?

Solution: The percent change in savings over the percent change in interest rates. $E = \%\Delta S/\%\Delta Ir$

Critical Thinking Questions

25. Transatlantic air travel in first class has an estimated elasticity of demand of 0.40 less than transatlantic air travel in economy class, with an estimated price elasticity of 0.62. Why do you think this is the case?

Solution: Due to the length of time it takes to travel across the Atlantic and the discomfort of traveling economy class, we would expect the sorts of people who purchase first class tickets to be largely unwilling to downgrade their preference for comfort, which yields an inelastic demand. Additionally, many transatlantic tickets are paid for by large companies on behalf of their employees, where price is less of a concern than for individuals traveling economy class.

26. What is the relationship between price elasticity and position on the demand curve? For example, as you move up the demand curve to higher prices and lower quantities, what happens to the measured elasticity? How would you explain that?

Solution: Demand becomes less elastic as we move up the demand curve, because elasticities are calculated as percentages. A large increase of an already high price may be only a small percentage increase, whereas a small decrease of an already very low quantity may be quite a large percentage decrease.

27. Can you think of an industry (or product) with near infinite elasticity of supply in the short term? That is, what is an industry that could increase Qs almost without limit in response to an increase in the price?

Solution: Many internet companies fall into this model, where the addition of one more user to a website has almost zero cost. Any site that operates on a subscription service could potentially do this, at least in the short run.

28. Would you expect supply to play a more significant role in determining the price of a basic necessity like food or a luxury like perfume? Explain. (Hint: Think about how the price elasticity of demand will differ between necessities and luxuries.)

Solution: Supply plays more of a role in determining the price of necessities, since demand for these items is inelastic and people cannot easily forego them. Prices for luxury goods are determined primarily by demand, as there are many easy substitutes for these items.

29. A city has built a bridge over a river and it decides to charge a toll to everyone who crosses. For one year, the city charges a variety of different tolls and records information on how many drivers cross the bridge. The city thus gathers information about elasticity of demand. If the city wishes to raise as much revenue as possible from the tolls, where will the city decide to charge a toll: in the inelastic portion of the demand curve, the elastic portion of the demand curve, or the unit elastic portion? Explain.

Solution: The city should charge a toll at the unit elastic portion of the demand curve. Charging more than this will see a larger decrease in drivers that will reduce revenue, and charging less than this will not increase traffic enough to make up for the lost revenues.

30. In a market where the supply curve is perfectly inelastic, how does an excise tax affect the price paid by consumers and the quantity bought and sold?

Solution: If the supply curve is perfectly inelastic, it is represented by a vertical curve. Sellers bear the entire tax burden, and the quantity bought and sold remains unchanged with the tax. The price paid by consumers remains the same, and the price received by sellers is reduced by the amount of the tax.

31. Normal goods are defined as having a positive income elasticity. We can divide normal goods into two types: Those whose income elasticity is less than one and those whose income elasticity is greater than one. Think about products that would fall into each category. Can you come up with a name for each category?

Solution: Goods with high income elasticity could be classified as luxuries. We buy more of them as our incomes rise, but are easily willing to give them up if our incomes fall. Goods with low income elasticities could be classified as necessities, where we don't vary our consumption much no matter how much money we make.

32. Suppose you could buy shoes one at a time, rather than in pairs. What do you predict the cross-price elasticity for left shoes and right shoes would be?

Solution: The cross price elasticity would be very nearly unitary, for few people would have a use for a left shoe without a right shoe and vice versa.

Problems

33. The equation for a demand curve is P = 48 – 3Q. What is the elasticity in moving from a quantity of 5 to a quantity of 6?

Solution:

P = 48 - 3(5) = 33;
P = 48 - 3(6) = 30;
E = %ΔQ/%ΔP= [(6 - 5)/5]/[(30 - 33)/33] = -2.2

34. The equation for a demand curve is P = 2/Q. What is the elasticity of demand as price falls from 5 to 4? What is the elasticity of demand as the price falls from 9 to 8? Would you expect these answers to be the same?

Solution: First solve for Q at both prices:

(5) = 2/Q; Q = 0.4
(4) = 2/Q; Q = 0.5
E = %ΔQ/%ΔP = [0.5 - 0.4)/0.4]/[(4 - 5)/5] = -1.25
We would expect the elasticity to be lower at the higher prices:
(9) = 2/Q; Q = 0.22
(8) = 2/Q; Q = 0.25
E = %ΔQ/%ΔP = [(0.25 - 0.22)/0.22]/[(8 - 9)/9] = -1.12

35. The equation for a supply curve is 4P = Q. What is the elasticity of supply as price rises from 3 to 4? What is the elasticity of supply as the price rises from 7 to 8? Would you expect these answers to be the same?

Solution:

4(3) = Q = 12;
4(4) = Q = 16;
E = %ΔQ/%ΔP = [(16 - 12)/12]/[(4 - 3)/3] = 1
At the higher price, the elasticity should be the same.
4(7) = Q = 28;
4(8) = Q = 32;
E = %ΔQ/%ΔP = [(32 - 28)/28]/[(8 - 7)/7] = 1

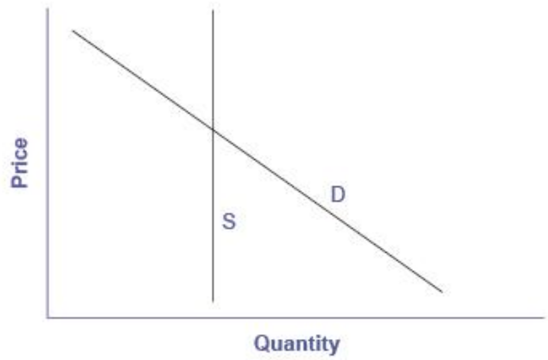
36. The equation for a supply curve is P = 3Q – 8. What is the elasticity in moving from a price of 4 to a price of 7?

Solution:

Solve for Q:
(4) = 3Q – 8; Q=4
(7) = 3Q – 8’ Q=5
E = %ΔQ/%ΔP = [(5 - 4)/4]/[(7 - 4)/4] = 0.33

37. The supply of paintings by Leonardo Da Vinci, who painted the Mona Lisa and The Last Supper and died in 1519, is highly inelastic. Sketch a supply and demand diagram, paying attention to the appropriate elasticities, to illustrate that demand for these paintings will determine the price.

Solution: The supply of Da Vinci paintings will be represented by a vertical line, since no amount of price fluctuation can change them. Price is therefore wholly determined by the position of the demand curve.



38. Say that a certain stadium for professional football has 70,000 seats. What is the shape of the supply curve for tickets to football games at that stadium? Explain.

Solution: The supply curve is almost perfectly inelastic, since the quantity of seats is fixed, and will therefore be represented by a vertical line. In the short run, no increase in demand can result in more than 70,000 seats being supplied.

39. When someone's kidneys fail, the person needs to have medical treatment with a dialysis machine (unless or until they receive a kidney transplant) or they will die. Sketch a supply and demand diagram, paying attention to the appropriate elasticities, to illustrate that the supply of such dialysis machines will primarily determine the price.

Solution: Given that the patient will die without the aid of a dialysis machine, their demand will be almost perfectly inelastic, as they will be willing to pay any amount of money to survive. The demand curve is therefore a near-vertical line, and price is determined by the position of the supply curve.

40. Assume that the supply of low-skilled workers is fairly elastic, but the employers' demand for such workers is fairly inelastic. If the policy goal is to expand employment for low-skilled workers, is it better to focus on policy tools to shift the supply of unskilled labor or on tools to shift the demand for unskilled labor? What if the policy goal is to raise wages for this group? Explain your answers with supply and demand diagrams.

Solution: To expand employment, the best option is to shift demand, since employers will not greatly respond to price changes. On the other hand, if the goal is to boost wages, shifting supply is a better option, since employers will not be able to easily reduce their workforce and will therefore have to pay a higher wage.

CHAPTER 6: THE MACROECONOMIC PERSPECTIVE

Self-Check Questions

1. Country A has export sales of $20 billion, government purchases of $1,000 billion, business investment is $50 billion, imports are $40 billion, and consumption spending is $2,000 billion. What is the dollar value of GDP?

Solution: GDP is C + I + G + (X–M). GDP= $2,000 billion + $50 billion + $1,000 billion + ($20 billion – $40 billion)=$3,030

2. Which of the following are included in GDP, and which are not?

- **a. The cost of hospital stays**
- **b. The rise in life expectancy over time**
- **c. Child care provided by a licensed day care center**
- **d. Child care provided by a grandmother**
- **e. The sale of a used car**
- **f. The sale of a new car**
- **g. The greater variety of cheese available in supermarkets**
- **h. The iron that goes into the steel that goes into a refrigerator bought by a consumer.**

Solution

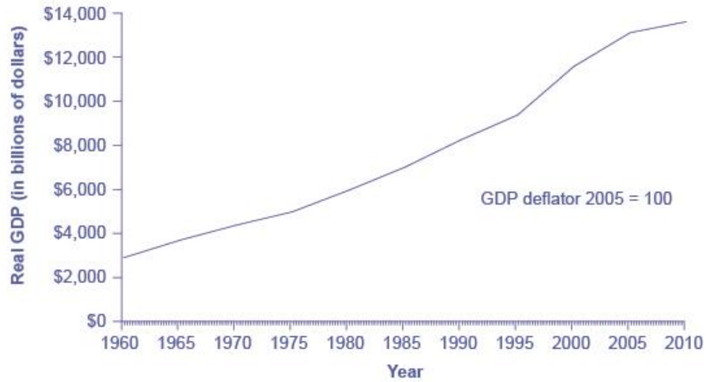
- a. Hospital stays are part of GDP.
- b. Changes in life expectancy are not market transactions and not part of GDP.
- c. Child care that is paid for is part of GDP.
- d. If Grandma gets paid, it is part of GDP, otherwise not.
- e. A used car is not produced this year, so it is not part of GDP.
- f. A new car is part of GDP.
- g. Variety does not count in GDP, where the cheese could all be cheddar.
- h. The iron definitely gets counted in GDP, but the trick is to avoid counting it more than once, so it is usually counted just in the purchase price of the car to avoid double counting.

3. Using data from the following table (shown previously in this chapter), how much of the nominal GDP growth from 1980 to 1990 was real GDP and how much was inflation?

Year	Nominal GDP (billions of dollars)	GDP Deflator (2005 = 100)
1960	543.3	19.0
1965	743.7	20.3
1970	1,075.9	24.88
1975	1,688.9	34.1
1980	2,862.5	48.33
1985	4,346.7	62.33
1990	5,979.6	72.77
1995	7,664.0	81.7
2000	10,289.7	89.0
2005	13,095.4	100.0
2010	14,958.3	110.0

Solution: From 1980 to 1990, nominal GDP grew by (5979.6 – 2862.5) / (2,862.5/100) =109%. Over the same period, prices increased by (72.7 – 48.3) / (48.3/100) = 50.5%. So about 46% of the growth (50.5/109) was inflation, and the remainder: 109% – 46% = 63% was growth in real GDP.

4. Consider the figure below. If a recession is defined as a significant decline in national output, can you identify any post-1960 recessions in addition to the recession of 2007–2009? This requires a judgment call.



Solution: Two other major recessions are visible in the figure as slight dips: those of 1973–1975, and 1981–1982. Two other recessions appear in the figure as a flattening of the path of real GDP. These were in 1990–1991 and 2001.

5. According to the following table from previously in the chapter, how often have recessions occurred since the end of World War II (1945)?

Trough	Peak	Months of Contraction	Months of Expansion
December 1900	September 1902	18	21
August 1904	May 1907	23	33
June 1908	January 1910	13	19
January 1912	January 1913	24	12
December 1914	August 1918	23	44
March 1919	January 1920	7	10
July 1921	May 1923	18	22
July 1924	October 1926	14	27
November 1927	August 1929	23	21
March 1933	May 1937	43	50
June 1938	February 1945	13	80
October 1945	November 1948	8	37
October 1949	July 1953	11	45
May 1954	August 1957	10	39
April 1958	April 1960	8	24
February 1961	December 1969	10	106
November 1970	November 1973	11	36
March 1975	January 1980	16	58
July 1980	July 1981	6	12
November 1982	July 1990	16	92
March 2001	November 2001	8	120
December 2007	June 2009	18	73

Solution: 11 recessions in approximately 70 years averages about one recession every six years.

6. According to the previous table (in Exercise 6.5), how long has the average recession lasted since the end of World War II?

Solution: Table 06_09 lists the "Months of Contraction" for each recession. Averaging these figures for the post-WWII recessions gives an average duration of 11 months, or slightly less than a year.

7. According to the previous table (in Exercise 6.5), how long has the average expansion lasted since the end of World War II?

Solution: Table 06_09 lists the "Months of Expansion". Averaging these figures for the post-WWII expansions gives an average expansion of 60.5 months, or more than five years.

8. Is it possible for GDP to rise while at the same time per capita GDP is falling? Is it possible for GDP to fall while per capita GDP is rising?

Solution: Yes. The answer to both questions depends on whether GDP is growing faster or slower than population. If population grows faster than GDP, GDP increases, while GDP per capita decreases. If GDP falls, but population falls faster, then GDP decreases, while GDP per capita increases.

9. The Central African Republic has a GDP of 1,107,689 million CFA francs and a population of 4.862 million. The exchange rate is 284.681CFA francs per dollar. Calculate the GDP per capita of Central African Republic.

Solution: Start with Central African Republic's GDP measured in francs. Divide it by the exchange rate to convert to U.S. dollars, and then divide by population to obtain the per capita figure. That is, 1,107,689 million francs / 284.681 francs per dollar / 4.862 million people = $800.28 GDP per capita.

10. Explain briefly whether each of the following would cause GDP to overstate or understate the degree of change in the broad standard of living.

- **a. The environment becomes dirtier.**
- **b. The crime rate declines.**
- **c. A greater variety of goods become available to consumers.**
- **d. Infant mortality declines.**

Solution

- a. A dirtier environment would reduce the broad standard of living, but not be counted in GDP, so a rise in GDP would overstate the standard of living.
- b. A lower crime rate would raise the broad standard of living, but not be counted directly in GDP, and so a rise in GDP would understate the standard of living.
- c. A greater variety of goods would raise the broad standard of living, but not be counted directly in GDP, and so a rise in GDP would understate the rise in the standard of living.
- d. A decline in infant mortality would raise the broad standard of living, but not be counted directly in GDP, and so a rise in GDP would understate the rise in the standard of living.

Review Questions

11. What are the main components of measuring GDP with what is demanded?

Solution: Consumption, investment, government spending, and net exports

12. What are the main components of measuring GDP with what is produced?

Solution: Durable goods, nondurable goods, services, structures, and the change in inventories

13. Would you usually expect GDP as measured by what is demanded to be greater than GDP measured by what is supplied, or the reverse?

Solution: These two measures should be the same, since every dollar that is spent is also someone's income.

14. Why must double counting be avoided when measuring GDP?

Solution: Counting the same production twice will result in a reported GDP that is higher than the actual amount of production. This occurs if the manufacturing inputs are counted as well as the final product. For example, GDP counts sale of a hamburger sold at a restaurant, but not the sales of the bun, meat and ketchup sold to the restaurant because all those inputs are counted at the final point of purchase.

15. What is the difference between a series of economic data over time measured in nominal terms versus the same data series over time measured in real terms?

Solution: Data measured in real terms keep the value of the currency constant, so as to better reflect actual price changes. Nominal measure allows the value of the currency to fluctuate.

16. How do you convert a series of nominal economic data over time to real terms?

Solution: Select a base year and measure changes in the value of the currency with respect to that year. The base year will have a price level of 100, and each other year's price level will be set accordingly. For example, if prices are 50% higher than in the base year, the price level will be 150. In short, to convert from nominal to real terms, for each year, divide the nominal figure by the price level and multiply by 100.

17. What are the typical patterns of GDP for a high-income economy like the United States in the long run and the short run?

Solution: GDP tends to grow in short bursts punctuated by recessions in the short run, and grow at a slow, steady rate in the long run.

18. What are the two main difficulties that arise in comparing the GDP of different countries?

Solution: Converting for the different currencies used by the countries, and adjusting for differing costs of living.

19. List some of the reasons why GDP should not be considered an effective measure of the standard of living in a country.

Solution: GDP doesn't measure things like disease rates, life expectancy, happiness, income inequality environmental degradation and any number of other aspects that contribute to the standard of living

Critical Thinking Questions

20. U.S. macroeconomic data are thought to be among the best in the world. Given what you learned in the Clear It Up titled "How do statisticians measure GDP?" about how the data are constructed, does this surprise you? Or does this simply reflect the complexity of a modern economy?

Solution: The macroeconomy is enormously complex, and even with all the countless data points collected on the U.S. economy, there are still many limits to what we can know.

21. What does GDP not tell us about the economy?

Solution: GDP as a static measure does not tell us about the pattern of economic growth, nor about how well each individual in the economy is doing, nor about the level of income inequality.

22. Should people typically pay more attention to their real income or their nominal income? If you choose the latter, why would that make sense in today's world? Would your answer be the same for the 1970s?

Solution: Real income measures the actual purchasing power of money, so it is a more useful value to pay attention to. Nominal values are not problematic when inflation is low, but when it is high, like in the 1970s, nominal values fail to reflect the true value of a dollar.

23. Why do you suppose that U.S. GDP is so much higher today than 50 or 100 years ago?

Solution: There are many reasons for this, including increased population and increases in technology that allow workers to be more productive.

24. Why do you think that GDP does not grow at a steady rate, but rather speeds up and slows down?

Solution: GDP growth can speed up following new innovations, such as the rapid growth we saw after the development of internet commerce, but these are inevitably followed by slowdowns or even recessions as investors change their attitudes.

25. Cross country comparisons of GDP per capita typically use purchasing power parity equivalent exchange rates, which are a measure of the long run equilibrium value of an exchange rate. In fact, we used PPP equivalent exchange rates in this module. Why could using market exchange rates, which sometimes change dramatically in a short period of time, be misleading?

Solution: Market exchange rats are subject to strong fluctuation, so depending on the time at which the comparison was made, you could come up with dramatically different levels of GDP that do not reflect the true economic well-being of the country.

26. Why might per capita GDP be only an imperfect measure of a country's standard of living?

Solution: Per capita GDP tells us little about the variety and quality of goods and services available for purchase, and tells us nothing about other measures like infant mortality, life expectancy or happiness.

27. How might a "Green" GDP be measured?

Solution: Production of goods and services that is measured by GDP also generates pollution and other environmental damages. Conceptually, we should deduct the costs of all environmental damages from the calculation of GDP to obtain a "Green" GDP. In practice, it is difficult to measure those costs, so the easiest solution may be to deduct all expenditures for pollution control from GDP.

Problems

28. Last year, a small nation with abundant forests cut down $200 worth of trees. $100 worth of trees was then turned into $150 worth of lumber. $100 worth of that lumber was used to produce $250 worth of bookshelves. Assuming the country produces no other outputs, and there are no other inputs used in the production of trees, lumber, and bookshelves, what is this nation's GDP? In other words, what is the value of the final goods produced including trees, lumber and bookshelves?

Solution: $100 worth of trees + $50 worth of lumber + $250 worth of bookshelves = $400 of GDP.

29. The "prime" interest rate is the rate that banks charge their best customers. Based on the nominal interest rates and inflation rates given in the following table, in which of the years given would it have been best to be a lender? Based on the nominal interest rates and inflation rates given in Table 06_07, in which of the years given would it have been best to be a borrower?

	Prime Interest Rate	Inflation Rate
1970	7.9%	5.7%
1974	10.8%	11.0%
1978	9.1%	7.6%
1981	18.9%	10.3%

Solution: It would be best to lend money in 1981 when the real interest rate is 18.9% - 10.3% = 8.6%. It would be best to borrow money in 1974 when the real interest rate is 10.8% - 11.0% = -0.2%

30. A mortgage loan is a loan that a person makes to purchase a house. The following table provides a list of the mortgage interest rate being charged for several different years and the rate of inflation for each of those years. In which years would it have been better to be a person borrowing money from a bank to buy a home? In which years would it have been better to be a bank lending money?

Year	Mortgage Interest Rate	Inflation Rate
1984	12.4%	4.3%
1990	10%	5.4%
2001	7.0%	2.8%

Solution: It would be best to borrow money in 2001 when the real interest rate was 7.0% - 2.8% = 4.2%. It would be best to lend money in 1984 when the real interest rate was 12.4% - 4.3% = 8.1%.

31. Ethiopia has a GDP of $8 billion (measured in U.S. dollars) and a population of 55 million. Costa Rica has a GDP of $9 billion (measured in U.S. dollars) and a population of 4 million. Calculate the per capita GDP for each country and identify which one is higher.

Solution:

Ethiopia: $8 billion/55 million = $145.45 per capita
Costa Rica: $9 billion/4 million = $2,250 per capita

Costa Rica's per capita GDP is much higher than that of Ethiopia.

32. In 1980, Denmark had a GDP of $70 billion (measured in U.S. dollars) and a population of 5.1 million. In 2000, Denmark had a GDP of $160 billion (measured in U.S. dollars) and a population of 5.3 million. By what percentage did Denmark's GDP per capita rise between 1980 and 2000?

Solution: Per capita GDP in 1980 = $70 billion/5.1 million = S13,725.49
Per capita GDP in 2000 = $160 billion/5.3 million = $30,188.68
Percent change = ($30,188.68 - $13,725.49)/$13,725.49 x 100 = 120%

33. The Czech Republic has a GDP of 1,800 billion koruny. The exchange rate is 20 koruny/U.S. dollar. The Czech population is 20 million. What is the GDP per capita of the Czech Republic expressed in U.S. dollars?

Solution:
Per capita GDP is 1,800 billion koruny / 20 million people = 90,000 koruny
Given the exchange rate, per capita GDP in U.S. dollars is 90,000 koruny/20 koruny per dollar = $4500 per person

CHAPTER 7: ECONOMIC GROWTH

Self-Check Questions

1. Explain what the Industrial Revolution was and where did it begin?

Solution: The Industrial Revolution refers to the widespread use of power-driven machinery and the economic and social changes that resulted in the first half of the 1800s. Ingenious machines—the steam engine, the power loom, and the steam locomotive—performed tasks that would have taken vast numbers of workers to do. The Industrial Revolution began in Great Britain, and soon spread to the United States, Germany, and other countries.

2. Explain the difference between property rights and contractual rights. Why do they matter to economic growth?

Solution: Property rights are the rights of individuals and firms to own property and use it as they see fit. Contractual rights then are based on property rights and they allow individuals to enter into agreements with others regarding the use of their property providing recourse through the legal system in the event of noncompliance. Economic growth occurs when the standard of living increases in an economy, which occurs when jobs are being created and incomes are rising. For this to happen societies must create a legal environment that gives individuals the ability to use their property to their fullest and highest use, including the right to trade or sell that property. Without a legal system that enforces contracts, people would not be likely to enter into contracts for current or future services because of the risk of non-payment. This would make it difficult to transact business and would slow economic growth.

3. Are there other ways in which we can measure productivity besides the amount produced per hour of work?

Solution: Yes. Since productivity is output per unit of input, we can measure productivity using GDP (output) per worker (input).

4. Assume there are two countries: South Korea and the United States. South Korea grows at 4% and the United States grows at 1%. For the sake of simplicity, assume they both start from the same fictional income level, $10,000. What will the incomes of the United States and South Korea be in 20 years? By how many multiples will each country's income grow in 20 years?

Solution: In 20 years the United States will have an income of 10,000*(1+0.01)20= $12,201.90, and South Korea will have an income of 10,000*(1+0.04)20= $21,911.23. South Korea has grown by a multiple of 2.1 and the United States by a multiple of 1.2.

5. What do the growth accounting studies conclude are the determinants of growth? Which is more important, the determinants or how they are combined?

Solution: Capital deepening and technology are important. What seems to be more important is how they are combined.

6. What policies can the government of a free-market economy implement to stimulate economic growth?

Solution: Government can contribute to economic growth by investing in human capital through the education system, building a strong physical infrastructure for transportation and commerce, increasing investment by lowering capital gains taxes, creating special economic zones that allow for reduced tariffs, and investing in research and development.

7. List the areas where government policy can help economic growth.

Solution: Public education, low investment taxes, funding for infrastructure projects, special economic zones

8. Use an example to explain why after periods of rapid growth, a low-income country that has not caught up to a high-income country may feel poor.

Solution: A good way to think about this is how a runner who has fallen behind in a race feels psychologically and physically as he catches up. Playing catch-up can be more taxing than maintaining one's position at the head of the pack.

9. Would the following events usually lead to capital deepening? Why or why not?

- **a. A weak economy in which businesses become reluctant to make long-term investments in physical capital.**
- **b. A rise in international trade.**
- **c. A trend in which many more adults participate in continuing education courses through their employers and at colleges and universities.**

Solution:

a. No. Capital deepening refers to an increase in the amount of capital per person in an economy. A decrease in investment by firms will actually cause the opposite of capital deepening (since the population will grow over time).

b. There is no direct connection between and increase in international trade and capital deepening. One could imagine particular scenarios where trade could lead to capital deepening (for example, if international capital inflows which are the counterpart to increasing the trade deficit) lead to an increase in physical capital investment), but in general, no.

c. Yes. Capital deepening refers to an increase in either physical capital or human capital per person. Continuing education or any time of lifelong learning adds to human capital and thus creates capital deepening.

10. What are the "advantages of backwardness" for economic growth?

Solution: The advantages of backwardness include faster growth rates because of the process of convergence, as well as the ability to adopt new technologies that were developed first in the "leader" countries. While being "backward" is not inherently a good thing, Gerschenkron stressed that there are certain advantages which aid countries trying to "catch up."

11. Would you expect capital deepening to result in diminished returns? Why or why not? Would you expect improvements in technology to result in diminished returns? Why or why not?

Solution: Capital deepening, by definition, should lead to diminished returns because you're investing more and more but using the same methods of production, leading to the marginal productivity declining. This is shown on a production function as a movement along the curve. Improvements in technology should not lead to diminished returns because you are finding new and more efficient ways of using the same amount of capital. This can be illustrated as a shift upward of the production function

12. Why does productivity growth in high-income economies not slow down as it runs into diminishing returns from additional investments in physical capital and human capital? Does this show one area where the theory of diminishing returns fails to apply? Why or why not?

Solution: Productivity growth from new advances in technology will not slow because the new methods of production will be adopted relatively quickly and easily, at very low marginal cost. Also, countries that are seeing technology growth usually have a vast and powerful set of institutions for training workers and building better machines, which allows the maximum amount of people to benefit from the new technology. These factors have the added effect of making additional technological advances even easier for these countries.

Review Questions

13. How did the Industrial Revolution increase the rate of economic growth and income levels in the United States?

Solution: The advent of mass production allowed laborers a greater degree of specialization, which increased efficiency and the gains from trade.

14. How much should a nation be concerned if its rate of economic growth is just 2% slower than other nations?

Solution: Over the long run, a 2% difference in economic growth rates can be extremely significant, so the nation should be reasonably concerned about this.

15. How is per capita GDP calculated differently from worker productivity?

Solution: The amount a worker can produce and that worker's income are not always exactly equal, so these numbers may differ.

16. How do gains in worker productivity lead to gains in per capita GDP?

Solution: As workers produce more, their wages will rise and they will have more disposable income for consumption, leading to a rise in GDP per capita.

17. What is an aggregate production function?

Solution: An aggregate production function describes the output of an entire economy based on various inputs such as capital, labor and technology.

18. What is capital deepening?

Solution: Capital deepening is when capital is increasing relative to the number of workers, which allows workers to become more productive.

19. What do economists mean when they refer to improvements in technology?

Solution: New machines or techniques that improve the productivity of labor, or that can be substituted for labor

20. For a high-income economy like the United States, what elements of the aggregate production function are most important in bringing about growth in per capita GDP? What about a middle-income country such as Brazil? A low-income country such as Niger?

Solution: High-income countries generally benefit most from growth in human capital, whereas middle and lower income countries benefit more from physical capital, since a little mechanization can go a long way for countries that are still developing.

21. List some arguments for and against the likelihood of convergence.

Solution: Convergence is likely to happen because of the diminishing marginal returns of education. Enacting basic reforms can lead to huge bursts of growth for developing countries, but an already developed country will have picked the low-hanging fruit already, and have a more difficult time of achieving rapid growth. On the other hand, convergence has only been witnessed to a limited degree in the real world, and there is a case to be made that the factors that make a country poor or rich are more innate than simply a product of changes in public policy. Additionally, continued technological innovations can prevent diminishing marginal returns from occurring which also prevents convergence from happening.

Critical Thinking Questions

22. Over the past 50 years, many countries have experienced an annual growth rate in per capita real GDP greater than of the U.S. Some examples are China, Japan, South Korea and Taiwan. Does that mean the U.S. is regressing relative to other countries? Does that mean these countries will eventually overtake the U.S. in terms of rate of growth of per capital real GDP? Explain.

Solution: Some models show that as a country industrializes, it experiences very high rates of growth that eventually flatten out. In all probability, these countries are simply catching up to the U.S. and will see their growth rates decline as they fully industrialize.

23. This section has outlined the logic of how increased productivity is associated with increased wages. Detail a situation where this is not the case and explain why it is not.

Solution: In cases where increased productivity reduces the skill required to perform a task, the market for workers in a particular industry can suddenly see a vast increase in supply, which leads to lower wages due to more competition.

24. Change in labor productivity is one of the most watched international statistics of growth. Visit the St. Louis Federal reserve website and find the data section (http://research.stlouisfed.org). Find international comparisons of worker productivity (Growth Rate of Total Labor Productivity) and compare two countries in the recent past.

Solution: Exercise left up to the student.

25. Refer back to the Work It Out feature titled "Comparing the Economies of Two Countries" and examine the data for the two countries you chose. How are they similar? How are they different?

Solution: Exercise left to the student.

26. Education seems to be important for human capital deepening. As people become better educated and more knowledgeable, are there limits to how much additional benefit more education can provide? Why or why not?

Solution: In the short run there are certainly limits to the productivity gains made from education, but in the long run as human knowledge improves these limits may become less pronounced.

27. Describe some of the political and social tradeoffs that might occur when a less developed country adopts a strategy to promote labor force participation and economic growth via investment in girls' education.

Solution: There could be many various ramifications depending on the situation, but for less developed countries one possibility is the difficulty in managing households and raising children in an environment where both sexes are working. There are also social norms and prejudice to be overcome that could make such a strategy less effective than it might otherwise be.

28. Why is investing in girls' education beneficial for growth?

Solution: A more educated populace is more productive, meaning that they can produce more, earn more and consumer more, which are all good for growth. There is no reason to expect that intelligence is found in men, but not women, so a nation that doesn't educate women is foregoing half the intelligence in its population. Additionally, there is some evidence that educating women has better outcomes for family health and education.

29. How is the concept of technology as defined with the aggregate production function different from our everyday use of the word?

Solution: Technology refers to any sort of process that improves productivity. It need not be mechanical or electronic to be considered technology.

30. What sorts of policies can governments implement to encourage convergence?

Solution: Developing countries should enact reforms that rapidly spur growth, such as better protections for private property and the transition from agriculture to industry. Developed nations can help by encouraging peaceful, non-corrupt institutions in other nations that can foster growth.

31. As technological change makes us more sedentary and food costs increase, obesity is likely. What factors do you think may limit obesity?

Solution: Increased education will limit obesity, as well as increased wealth that allows us to afford healthier food and more free time for physical activity.

Problems

32. An economy starts off with a per capita GDP of $5000. How large will the per capita GDP be if it grows at an annual rate of 2% for 20 years? 2% for 40 years? 4% for 40 years? 6% for 40 years?

Solution:

$5000 x 1.02^20 = $7429.74
$5000 x 1.02^40 = $11,040.20
$5000 x 1.06^40 = $51,428.59

33. An economy starts off with a per capita GDP of 12,000 euros. How large will the per capita GDP be if it grows at an annual rate of 3% for 10 years? 3% for 30 years? 6% for 30 years?

Solution:

12,000 x 1.03^10 = 16,127 euros
12,000 x 1.03^30 = 29,127 euros
12,000 x 1.06^30 = 68,922 euros

34. Say that the average worker in Canada has a productivity level of $30 per hour while the average worker in the United Kingdom has a productivity level of $25 per hour (both measured in U.S. dollars). Over the next five years, say that worker productivity in Canada grows at 1% per year while worker productivity in the UK grows 3% per year. At that point, who will have the higher productivity level, and by how much?

Solution: The Canadian worker's productivity will be $30 x 1.01^5 = $31.53 per hour, and the UK worker's productivity will be $25 x 1.03^5 = $28.98 per hour.

35. Say that the average worker in the U.S. economy is eight times as productive as an average worker in Mexico. If the productivity of U.S. workers grows at 2% for 25 years and the productivity of Mexico's workers grows at 6% for 25 years, which country will have higher worker productivity at that point?

Solution: If M is the productivity of the Mexican worker initially, then at the end of 25 years the Mexican worker will have a productivity of M x 1.06^25 = 4.3M.

The U.S. worker will have productivity of 8M x 1.02^25 = 13.1M.

So U.S. worker productivity will be just over three times more than Mexican productivity at the end of 25 years.

CHAPTER 8: UNEMPLOYMENT

Self-Check Questions

1. Suppose the adult population over the age of 16 is 237.8 million and the labor force is 153.9 million (of whom 139.1 million are employed). How many people are "not in the labor force?" What are the proportions of employed, unemployed and not in the labor force in the population? Hint: Proportions are percentages.

Solution: The population is divided into those "in the labor force" and those "not in the labor force." Thus, the number of adults not in the labor force is 237.8 – 153.9 = 83.9 million. Since the labor force is divided into employed persons and unemployed persons, the number of unemployed persons is 153.9 – 139.1 = 14.8 million. Thus, the adult population has the following proportions:
139.1/237.8 = 58.5% employed persons
14.8/237.8 = 6.2% unemployed persons
83.9/237.8 = 35.3% persons out of the labor force

2. Using the above data, what is the unemployment rate? These data are U.S. statistics from 2010. How does it compare to the 2012 unemployment rate computed earlier?

Solution: The unemployment rate is defined as the number of unemployed persons as a percentage of the labor force or 14.8/153.9 = 9.6%. This is higher than the 2012 unemployment rate, computed earlier, of 8.1%.

3. Over the long term, has the U.S. unemployment rate generally trended up, trended down, or remained at basically the same level?

Solution: Over the long term, the U.S. unemployment rate has remained basically the same level.

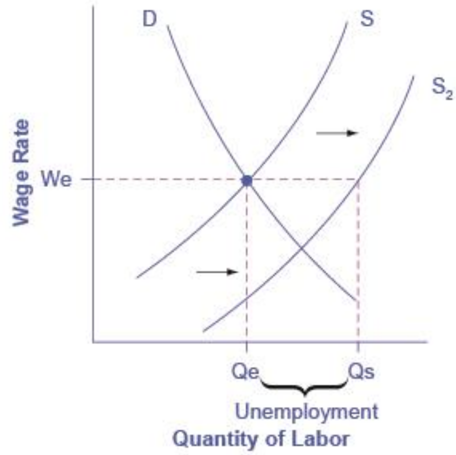
4. Whose unemployment rates are commonly higher in the U.S. economy:
   a. Whites or nonwhites?
   b. The young or the middle-aged?
   c. College graduates or high school graduates?

Solution

a. Nonwhites
b. The Young
c. High school graduates

5. Beginning in the 1970s and continuing for three decades, women entered the U.S. labor force in a big way. If we assume that wages are sticky in a downward direction, but that around 1970 the demand for labor equaled the supply of labor at the current wage rate, what do you imagine happened to the wage rate, employment, and unemployment as a result of increased labor force participation?

Solution: Because of the influx of women into the labor market, the supply of labor shifts to the right. Since wages are sticky downward, the increased supply of labor causes an increase in people looking for jobs (Qs), but no change in the number of jobs available (Qe). As a result, unemployment increases by the amount of the increase in the labor supply. This can be seen in the following figure.
Over time, as labor demand grows, the unemployment will decline and eventually wages will begin to increase again. But this increase in labor demand goes beyond the scope of this problem.



6. Is the increase in labor force participation among women better thought of as causing an increase in cyclical unemployment or an increase in the natural rate of unemployment? Why?

Solution: The increase in labor supply was a social demographic trend—it was not caused by the economy falling into a recession. Therefore, the influx of women into the work force increased the natural rate of unemployment.

7. Many college students graduate from college before they have found a job. When graduates begin to look for a job, they are counted as what category of unemployed?

Solution: New entrants to the labor force, whether from college or otherwise, are counted as frictionally unemployed until they find a job.

Review Questions

8. What is the difference between being unemployed and being out of the labor force?

Solution: A person who is "unemployed" is trying, but unable, to find a job. A person "out of the labor force" is not working nor looking for work, such as a student or a retiree.

9. How is the unemployment rate calculated? How is the labor force participation rate calculated?

Solution: The unemployment rate is the number of unemployed people divided by the labor force. The labor force participation rate is the number of people in the labor force divided by the total population.

10. Are all adults who do not hold jobs counted as unemployed?

Solution: No, only adults who do not hold jobs but are in the labor force are unemployed.

11. If you are out of school but working part time, are you considered employed or unemployed in U.S. labor statistics? If you are a full time student and working 12 hours a week at the college cafeteria are you considered employed or not in the labor force? If you are a senior citizen who is collecting social security and a pension and working as a greeter at Wal-Mart are you considered employed or not in the labor force?

Solution: All three of these examples count as employed, since they are working in some sort of job.

12. What happens to the unemployment rate when unemployed workers are reclassified as discouraged workers?

Solution: The unemployment rate drops as the labor force declines.

13. What happens to the labor force participation rate when employed individuals are reclassified as unemployed? What happens when they are reclassified as discouraged workers?

SolutionWhen employed workers become unemployed, the labor force participation rate remains unchanged, but when unemployed works become discouraged, the labor force participation rate declines.

14. What are some of the problems with using the unemployment rate as an accurate measure of overall joblessness?

Solution: The unemployment rate doesn't account for discouraged workers or workers who are underemployed.

15. What criteria are used by the BLS to count someone as employed? As unemployed?

Solution: A person is employed if they are working, even part-time. A person is unemployed if they are looking for a job but are unable to find one.

16. Assess whether the following would be counted as "unemployed" in the Current Employment Statistics survey.

- **a. A husband willingly stays home with children while his wife works.**
- **b. A manufacturing worker whose factory just closed down.**
- **c. A college student doing an unpaid summer internship.**
- **d. A retiree.**
- **e. Someone who has been out of work for two years but keeps looking for a job.**
- **f. Someone who has been out of work for two months but isn't looking for a job.**
- **g. Someone who hates her present job and is actively looking for another one.**
- **h. Someone who decides to take a part time job because she could not find a full time position.**

Solution

- a. Not unemployed.
- b. Unemployed.
- c. Not unemployed.
- d. Not unemployed.
- e. Unemployed.
- f. Not unemployed.
- g. Not unemployed.
- h. Not unemployed.

17. Are U.S. unemployment rates typically higher, lower, or about the same as unemployment rates in other high-income countries?

Solution: U.S. unemployment rates have generally been lower than in other high income countries.

18. Are U.S. unemployment rates distributed evenly across the population?

Solution: No. Unemployment rates vary wildly across demographics such as age and race.

19. When would you expect cyclical unemployment to be rising? Falling?

Solution: Cyclical unemployment rises during a contraction and falls during an expansion of the economy.

20. Why is there unemployment in a labor market with flexible wages?

Solution: Some structural and frictional unemployment is inevitable, even when wages are flexible. There may also be time delays while wages adjust during which there will be unemployment.
Solution: Cyclical unemployment rises during a contraction and falls during an expansion of the economy.

21. Name and explain some of the reasons why wages are likely to be sticky, especially in downward adjustments.

Solution: Contracts often prevent wages from adjusting quickly, and workers have a strong resistance to wage decreases, so wage adjustments downward are politically difficult for firms to manage rapidly.

22. What term describes the remaining level of unemployment that occurs even when the economy is healthy?

Solution: The natural rate of unemployment.

23. What forces create the natural rate of unemployment for an economy?

Solution: The natural rate of unemployment is determined mainly by frictional unemployment, the unemployment that occurs when moving from job to job.

24. Would you expect the natural rate of unemployment to be roughly the same in different countries?

Solution: No. Public policies can affect the natural rate of unemployment by imposing wage floors or regulations that make moving from job to job more difficult.

25. Would you expect the natural rate of unemployment to remain the same within one country over the long run of several decades?

Solution: In general, the natural rate of unemployment should remain roughly the same over time barring any drastic reforms to public policy.

26. What is frictional unemployment? Give examples of frictional unemployment.

Solution: Frictional unemployment occurs in the time spent moving from one job to another. For example, if a worker leaves his job to pursue a different career or to start his own business, he is frictionally unemployed until he obtains a new job.

27. What is structural unemployment? Give examples of structural unemployment.

Solution: Structural unemployment occurs when the skills of workers don't match what is demanded in the economy. For example, many workers in Detroit found themselves structurally unemployed when the American automobile industry fell into decline.

28. After several years of economic growth, would you expect the unemployment in an economy to be mainly cyclical or mainly due to the natural rate of unemployment? Why?

Solution: Since U.S. postwar recessions typically last less than one year, if the economy has positive growth for several years, the observed unemployment is likely to be mainly frictional and structural, that is, mainly due to the natural rate of unemployment, not cyclical unemployment.

29. What type of unemployment (cyclical, frictional, or structural) applies to each of the following:

a. landscapers laid off in response to drop in new housing construction during a recession.
b. coal miners laid off due to EPA regulations that shut down coal fired power
c. a financial analyst who quits his/her job in Chicago and is pursing similar work in Arizona
d. printers laid off due to drop in demand for printed catalogues and flyers as firms go the internet to promote an advertise their products.
e. factory workers in the U.S. laid off as the plants shut down and move to Mexico and Ireland.

Solution

a. Cyclical
b. Structural
c. Frictional
d. Structural
e. Structural

Critical Thinking Questions

30. Using the definition of the unemployment rate, is an increase in the unemployment rate necessarily a bad thing for a nation?

Solution: No. If discouraged workers are re-entering the labor force, the unemployment rate will rise, even as more opportunities become available for workers.

31. Is a decrease in the unemployment rate necessarily a good thing for a nation? Explain.

Solution: No. If workers are becoming discouraged and dropping out of the labor force, the unemployment rate will decline despite the bad economic conditions.

32. If many workers become discouraged from looking for jobs, explain how the number of jobs could decline but the unemployment rate could fall at the same time.

Solution: If more people are dropping out of the labor force than are becoming unemployed, the unemployment rate will decline even as jobs are lost.

33. Would you expect hidden unemployment to be higher, lower, or about the same when the unemployment rate is high, say 10%, versus low, say 4%? Explain.

Solution: Hidden unemployment is generally higher when the unemployment rate is high, because this indicates a generally weak labor market.

34. Is the higher unemployment rate for minority workers necessarily an indication of discrimination? What could be some other reasons for the higher unemployment rate?

Solution: Not necessarily. If minority workers have less education or fewer marketable skills, we would expect their unemployment rates to be higher.

35. While unemployment is highly negatively correlated with the level of economic activity, in the real world it responds with a lag. In other words, firms do not immediately lay off workers in response to a sales decline. They wait a while before responding. Similarly, firms do not immediately hire workers when sales pick up. What do you think accounts for the lag in response time?

Solution: Because there are significant costs to recruiting and training new employees, firms will want to be sure that a change in sales, either positive or negative, will last before they lay off workers or hire new ones. This causes a lagged response. In addition, some firms have long-term contracts with their employees that prevent them from laying off workers at will.

36. Why do you think that unemployment rates are lower for individuals with more education?

Solution: Workers with more education are more in demand and there are fewer of them to go around, so it is easier for them to find work than for uneducated workers.

37. Do you think it is rational for workers to prefer sticky wages to wage cuts, when the consequence of sticky wages is unemployment for some workers? Why or why not? How do the reasons for sticky wages explained in this section apply to your argument?

Solution: The workers who are able to keep their jobs are decidedly better off with sticky wages in place, although those who do lose their jobs may not agree. Workers generally prefer the certainty of long term contracts that prevent wages from falling, because they do not personally face the unemployment consequences of their wages being sticky.

38. Under what condition would a decrease in unemployment be bad for the economy?

Solution: When the decrease is driven by discouraged workers leaving the labor force.

39. Under what condition would an increase in the unemployment rate be a positive sign?

Solution: When discouraged workers become more optimistic and start trying to find work again.

40. As the baby boom generation retires, the ratio of retirees to workers will increase noticeably. How will this affect the Social Security program? How will this affect the standard of living of the average American?

Solution: Baby Boomers will put a greater strain on the Social Security Program, with either cuts in benefits or an increase in payroll taxes to maintain current benefits. Either way, the effect on the standard of living will be negative.

41. Unemployment rates have been higher in many European countries in recent decades than in the United States. Is the main reason for this long-term difference in unemployment rates more likely to be cyclical unemployment or the natural rate of unemployment? Explain briefly.

Solution: The natural rate of unemployment mainly drives this difference, as public policies in European countries more strongly favor labor unions and high minimum wages that increase the natural unemployment rate.

42. Is it desirable to pursue a goal of zero unemployment? Why or why not?

Solution: No. A certain amount of unemployment is necessary for an economy to be flexible in creating new jobs and new industries.

43. Is it desirable to eliminate natural unemployment? Why or why not (Hint: Think about what our economy would look like today and what assumptions would have to be met to have a zero rate of natural unemployment.)

Solution: A natural rate of zero unemployment would mean thta no one in the economy is looking for a job. This would make starting a new business impossible, and would not be a good goal to pursue.

44. The U.S. unemployment rate increased from 4.6% in July 2001 to 5.9% by June 2002. Without studying the subject in any detail, would you expect that a change of this kind is more likely to be due to cyclical unemployment or a change in the natural rate of unemployment? Why?

Solution: Changes in the unemployment rate over a single year are more likely to be cyclical than changes to the natural rate, which usually takes a longer time to occur.

Problems

45. A country with a population of eight million adults has five million employed, 500,000 unemployed, and the rest of the adult population is out of the labor force. What's the unemployment rate? What share of population is in the labor force? Sketch a pie chart that divides the adult population into these three groups.

Solution: The unemployment rate is 500,000/5,500,000 x 100 = 11%
The labor force participation rate is 5,500,000 / 8,000,000 x 100 = 68.75%

46. A government passes a family-friendly law that no companies can have evening, nighttime, or weekend hours, so that everyone can be home with their families during these times. Analyze the effect of this law using a demand and supply diagram for the labor market: first assuming that wages are flexible, and then assuming that wages are sticky downward.

Solution: The mandatory reduction in hours imposes a constraint on the demand for labor. Since companies can no longer get as many hours out of workers, they will not be willing to pay as much, and demand shifts to the left. The result is either a decrease in wages, if wages are flexible, or unemployment, if wages are sticky. Alternatively, the preexisting wages are likely to include a premium for work during evening, nighttime or weekend hours. The mandatory reduction will result in the loss of that premium which means the average wage will decrease, and there will be fewer work hours, namely those that would have occurred at less convenient times.

47. As the baby boomer generation retires, what should happen to wages and employment? Can you show this graphically?

Solution: As workers leave the labor force to retire, the supply of labor shifts left, driving up wages and reducing the number of people employed. The unemployment rate may drop, however, as Baby Boomers leave the labor force

CHAPTER 9: INFLATION

Self-Check Questions

1. The table shows the prices of fruit purchased by the typical college student from 2001 to 2004. What is the amount spent each year on the "basket" of fruit with the quantities shown in column 2?

Items	Qty.	2001		2002		2003		2004	
		Price	Amount Spent	Price	Amount Spent	Price	Amount Spent	Price	Amount Spent
Apples	10	$0.50		$0.75		$0.85		$0.88	
Bananas	12	$0.20		$0.25		$0.25		$0.29	
Grapes	2	$0.65		$0.70		$0.90		$0.95	
Raspberries	1	$2.00		1.9		2.05		2.13	$2.13
Total									

Solution: To compute the amount spent on each fruit in each year, you multiply the quantity of each fruit by the price.
10 apples × 50 cents each = $5.00 spent on apples in 2001
12 bananas × 20 cents each = $2.40 spent on bananas in 2001
2 bunches of grapes at 65 cents each = $1.30 spent on grapes in 2001
1 pint of raspberries at $2 each = $2.00 spent on raspberries in 2001
Adding up the amounts gives you to total cost of the fruit basket. The total cost of the fruit basket in 2001 was $5.00 + $2.40 + $1.30 + $2.00 = $10.70. The total costs for all the years are shown in Table 22_05.

Year	2001	2002	2003	2004
Total	$10.70 0	$13.80 0	$15.35 5	$16.31

2. Construct the price index for a "fruit basket" in each year using 2003 as the base year.

Solution: If 2003 is the base year, then the index number has a value of 100 in 2003. To transform the cost of a fruit basket each year, we divide each year's value by $15.35, the value of the base year, and then multiply the result by 100. The price index is shown in the table below.

2001		2002		2003		2004
69.71		89.90		100.00		106.3

Note that the base year has a value of 100; years before the base year have values less than 100; and years after have values more than 100.

3. Compute the inflation rate for fruit prices from 2001 to 2004.

Solution: The inflation rate is calculated as the percentage change in the price index from year-to-year. For example, the inflation rate between 2001 and 2002 is (84.61 - 69.71) / 69.71 = 0.2137%. The inflation rates for all the years are shown in the last row of the table below.

Items	Quantity	2001		2002		2003		2004	
		Price	Amount Spent	Price	Amount Spent	Price	Amount Spent	Price	Amount Spent
Apples	10	$0.50	$5.00	$0.75	$7.50	$0.85	$8.50	$0.88	$8.80
Bananas	12	$0.20	$2.40	$0.25	$3.00	$0.25	$3.00	$0.29	$3.48
Grapes	2	$0.65	$1.30	$0.70	$1.40	$0.90	$1.80	$0.95	$1.90
Raspberries	1	$2.00	$2.00	1.9	$1.90	2.05	$2.05	2.13	$2.13
Total			$10.70		$13.80		$15.35		$16.31
Price Index			69.71		84.61		100.00		106.3
Inflation Rate					21.37%		18.19%		6.3%

4. Edna is living in a retirement home where most of her needs are taken care of, but she has some discretionary spending. Based on the basket of goods in the table below, by what percentage does Edna's cost of living increase between time 1 and time 2?

	Quantity	**Price at Time 1**	**Price at Time 2**
Gifts for grandchildren	**12**	**50**	**60**
Pizza delivery	**24**	**15**	**16**
Blouses	**6**	**60**	**50**
Vacation trips	**2**	**400**	**420**

Solution: Begin by calculating the total cost of buying the basket in each time period, as shown in following table.

	Quantity	Price at Time 1	Total Cost in Time 1	Price at Time 2	Total Cost in Time 2
Gifts	12	50	600	60	720
Pizza	24	15	360	16	384
Blouses	6	60	360	50	300
Trips	2	400	800	420	840
Total Cost			$2,120		$2,244

The rise in cost of living is calculated as the percentage increase: (2244 – 2120) / 2120 = 0.0585 = 5.85%.

5. Section 9.2 "How Changes in the Cost of Living are Measured" introduced a number of different price indices. Which price index would be best to use to adjust your paycheck for inflation?

Solution: Since the CPI measures the prices of the goods and services purchased by the typical urban consumer, it measures the prices of things that people buy with their paycheck. For that reason, the CPI would be the best price index to use for this purpose.

6. The Consumer Price Index is subject to the substitution bias and the quality/new goods bias. Are the Producer Price Index and the GDP Deflator also subject to these biases? Why or why not?

Solution: The PPI is subject to those biases for essentially the same reasons as the CPI is. The GDP deflator picks up prices of what is actually purchased that year, so there are no biases. That is the advantage of using the GDP deflator over the CPI.

7. Go to the Purchasing Power Calculator at MeasuringWorth.com (http://www.measuringworth.com/ppowerus/). How much money would it take today to purchase what one dollar would have bought in the year of your birth?

Solution: The calculator requires you to input three numbers:
The first year, in this case the year of your birth
The amount of money you would want to translate in terms of its purchasing power
The last year—now or the most recent year the calculator will accept
My birth year is 1955. The amount is $1. 2012 is currently the latest year the calculator will accept. The simple purchasing power calculator shows that $1 of purchases in 1955 would cost $8.57 in 2012. The website also explains how the true answer is more complicated than that shown by the simple purchasing power calculator.

8. If inflation rises unexpectedly by 5%, would a state government borrowing money to pay for a new highway benefit or lose?

Solution: Borrowers benefit from high inflation, because the amount of money they have to pay back is worth less than it used to be.

9. How should an increase in inflation affect the interest rate on an adjustable-rate mortgage?

Solution: Higher inflation reduces real interest rates on fixed rate mortgages. Because ARMs can be adjusted, higher inflation leads to higher interest rates on ARMs.

10. A fixed-rate mortgage has the same interest rate over the life of the loan, whether the mortgage is for 15 or 30 years. By contrast, an adjustable-rate mortgage changes with market interest rates over the life of the mortgage. If inflation falls unexpectedly by 3%, what would likely happen to a homeowner with an adjustable-rate mortgage?

Solution: Because the mortgage has an adjustable rate, the rate should fall by 3%, the same as inflation, to keep the real interest rate the same.

Review Questions

11. How is a basket of goods and services used to measure the price level?

Solution: By selecting a basket of specific goods to track prices, we are able to get a more accurate representation of the costs faced by different groups of consumers or producers.

12. Why are index numbers used to measure the price level rather than dollar value of goods?

Solution: Index numbers are easier to compare to one another, as the value of a dollar will change over time.

13. What is the difference between the price level and the rate of inflation?

Solution: The rate of inflation is the change in the price level from one period to another, while the price levels itself is a gauge of overall prices throughout the economy at a particular point in time.

14. Why does "substitution bias" arise if the inflation rate is calculated based on a fixed basket of goods?

Solution: The inflation rate may be overstated because the basket of goods assumes that people will not substitute for cheaper alternatives when the prices of goods rise.

15. Why does the "quality/new goods bias" arise if the inflation rate is calculated based on a fixed basket of goods?

Solution: The inflation rate may be overstated if price increases are due to changes in quality rather than a decrease in the value of the currency.

16. What has been a typical range of inflation in the U.S. economy in the last decade or so?

Solution: Inflation in the last decade, as measured by CPI, has typically been between 1% and 3%.

17. Over the last century, during what periods was the U.S. inflation rate highest and lowest?

Solution: The U.S. inflation rate was highest during the 1970s and lowest during the 1930s, when deflation actually occurred.

18. What is deflation?

Solution: Deflation is a generally lowering of prices, or a rise in the value of a currency.

19. Identify several parties likely to be helped and hurt by inflation.

Solution: Borrowers and employers paying wages determined by long-term contracts are helped by inflation, but lenders and consumers are hurt.

20. What is indexing?

Solution: Indexing is when some rate of payment is set to increase automatically at the same pace as inflation.

21. Name several forms of indexing in the private and public sector.

Solution: Most government benefits, such as Social Security, are indexed to CPI, and lately there has been a lot of discussion of doing the same thing for minimum wages.

Critical Thinking Questions

22. Inflation rates, like most statistics, are imperfect measures. Can you identify some ways that the inflation rate for fruit does not perfectly capture the rising price of fruit?

Solution: For one thing, it does not account for consumers' tendency to switch for a substitute good when the price of one type of fruit rises. The inflation rate might also fail to account for changes in the quality of fruit over time.

23. Given the federal budget deficit in recent years, some economists have argued that by adjusting Social Security payments for inflation using the CPI, Social Security is overpaying recipients. What is the argument being made, and do you agree or disagree with it?

Solution: The argument is that the CPI has been rising faster than the actual cost of living for seniors due to the substitution bias and quality/new goods bias.

24. Why is the GDP deflator not an accurate measure of inflation as it impacts a household?

Solution: The GDP deflator is an aggregate of the entire economy, which is not representative of what households spend their money on.

25. Imagine that the government statisticians who calculate the inflation rate have been updating the basic basket of goods once every 10 years, but now they decide to update it every five years. How will this change affect the amount of substitution bias and quality/new goods bias?

Solution: This change should reduce these biases by keeping closer track of consumer behavior over time.

26. Describe a situation, either a government policy situation, an economic problem, or a private sector situation, where using the CPI to convert from nominal to real would be more appropriate than using the GDP deflator.

Solution: One example might be a decision to index minimum wages to inflation. A minimum wage worker probably faces costs that are more represented by the CPI than by the GDP deflator.

27. Describe a situation, either a government policy situation, an economic problem, or a private sector situation, where using the GDP deflator to convert from nominal to real would be more appropriate than using the CPI.

Solution: The GDP deflator is more appropriate to use when comparing overall economic growth over time, as it represents the entire economy, not just consumers.

28. Why do you think the U.S. experience with inflation over the last 50 years has been so much milder than in many other countries?

Solution: The U.S. has been more careful about using monetary policy to inflate its currency than many other countries have been. This is probably in part because the Federal Reserve is shielded from the political process, unlike most other countries. Sometimes countries have needed to print money to pay off debt, which we have thankfully not had to do yet.

29. If, over time, wages and salaries on average rise at least as fast as inflation, why do people worry about how inflation affects incomes?

Solution: Wages tend to be sticky, and in the time it takes for them to catch up with inflation, households can see large chunks of their savings devalued.

30. Who in an economy is the big winner from inflation?

Solution: The government is the biggest borrower of money, so it would likely benefit the most from inflation.

31. If a government gains from unexpected inflation when it borrows, why would it choose to offer indexed bonds?

Solution: Indexed bonds are a way of encouraging investment, since they offer a level of protection against inflation. Since these are safer for investors, the government does not have to offer as high of an interest rate on the bonds as it otherwise might.

32. Do you think perfect indexing is possible? Why or why not?

Solution: There is no perfect measure for inflation, so perfect indexing is not possible. No one metric can fully capture the complex nature of the price system, and you cannot index to multiple metrics at the same time.

Problems

33. The index number representing the price level changes from 110 to 115 in one year, and then from 115 to 120 the next year. Since the index number increases by five each year, is five the inflation rate each year? Is the inflation rate the same each year? Explain your answer

Solution: The inflation rate is a percentage change over time, so the rates are not the same.
The first change is (115 - 110)/110 x 100 = 4.5%
The second is (120 - 115)/115 x 100 = 4.3%

34. The total price of purchasing a basket of goods in the United Kingdom over four years is: year 1=£940, year 2=£970, year 3=£1000, and year 4=£1070. Calculate two price indices, one using year 1 as the base year (set equal to 100) and the other using year 4 as the base year (set equal to 100). Then, calculate the inflation rate based on the first price index. If you had used the other price index, would you get a different inflation rate? If you are unsure, do the calculation and find out.

Solution: The first index would look like this.
1: 100
2: 970/940 x 100 = 103.2 Percent change = (103.2-100)/100 = 3.2%
3: 1000/940 x 100 = 106.4 Percent change = (106.4-103.2)/103.2 =3.1%
4: 1070/940 x 100= 113.8 Percent change = (113.8-106.4)/106.4 =7.0%
The second index would look like this.
1: 940/1070 x 100 = 87.9
2: 970/1070 x 100 = 90.7 Percent change = (90.7-87.9)/87.9 = 3.2%
3: 1000/1070 x 100 = 93.5 Percent change = (93.5-90.7)/90.7 = 3.1%
4: 100 Percent change = (100-93.5)/93.5 = 7.0%
Though the two price indices have different numbers, if you compute the percent change of each you will see that the inflation rates are the same for both indices.

35. Within 1 or 2 percentage points, what has the U.S. inflation rate been during the last few years?

Solution: The last few years have generally seen an inflation rate of between 1% and 3%.

36. If inflation rises unexpectedly by 5%, indicate for each of the following whether the economic actor is helped, hurt, or unaffected:
  - **a. A union member with a COLA wage contract**
  - **b. Someone with a large stash of cash in a safe deposit box**
  - **c. A bank lending money at a fixed rate of interest**
  - **d. A person who is not due to receive a pay raise for another 11 months**

Solution

a. Largely unaffected, since COLA allows wages to increase with inflation.
b. Hurt, since his cash would be worth less.
c. Hurt, since higher inflation lowers the real interest rate.
d. Hurt, since his wages will be worth less.

37. Rosalie the Retiree knows that when she retires in 16 years, her company will give her a one-time payment of $20,000. However, if the inflation rate is 6% per year, how much buying power will that $20,000 have when measured in today's dollars? (Hint: Start by calculating the rise in the price level over the 16 years.)

Solution: If the initial price level is 100, the price level after 16 years will be 100 x 1.06^16 = 254. Thus prices will be 2.54 times higher, and the purchasing power of the $20,000 will only be $20,000/2.54 = $7874.

CHAPTER 10: THE INTERNATIONAL TRADE AND CAPITAL FLOWS

1. If foreign investors buy more U.S. stocks and bonds, how would that show up in the current account balance?

Solution: The stock and bond values will not show up in the current account. However, the dividends from the stocks and the interest from the bonds show up as an import to income in the current account.

2. If the trade deficit of the United States increases, how is the current account balance affected?

Solution: It becomes more negative as imports, which are a negative to the current account, are growing faster than exports, which are a positive.

3. State whether each of the following events involves a financial flow to the Mexican economy or a financial flow out of the Mexican economy:

a. Mexico imports services from Japan
b. Mexico exports goods to Canada
c. U.S. investors receive a return from past financial investments in Mexico

Solution

a. Money will flow out of the Mexican economy.
b. Money flows into the Mexican economy.
c. Money flows out of the Mexican economy.

4. In what way does comparing a country's exports to GDP reflect how globalized it is?

Solution: GDP is a dollar value of all production of goods and services. Exports are produced domestically but shipped abroad. The percent ratio of exports to GDP gives us an idea of how important exports are to the national economy out of all goods and services produced. For example, exports represent only 14% of U.S. GDP, but 50% of Germany's GDP

5. Canada's GDP is $1.736 trillion and its exports are $447 billion. What is Canada's export ratio?

Solution: Divide $447 billion by $1,736 trillion.

6. The GDP for the United States is $14.7 trillion and its current account balance is –$291 billion. What percent of GDP is the current account balance?

Solution: Divide –291 billion by $14.7 trillion.

7. Why does the trade balance and the current account balance track so closely together over time?

Solution: The trade balance is the difference between exports and imports. The current account balance includes this number (whether it is a trade balance or a trade surplus), but also includes international flows of money from global investments.

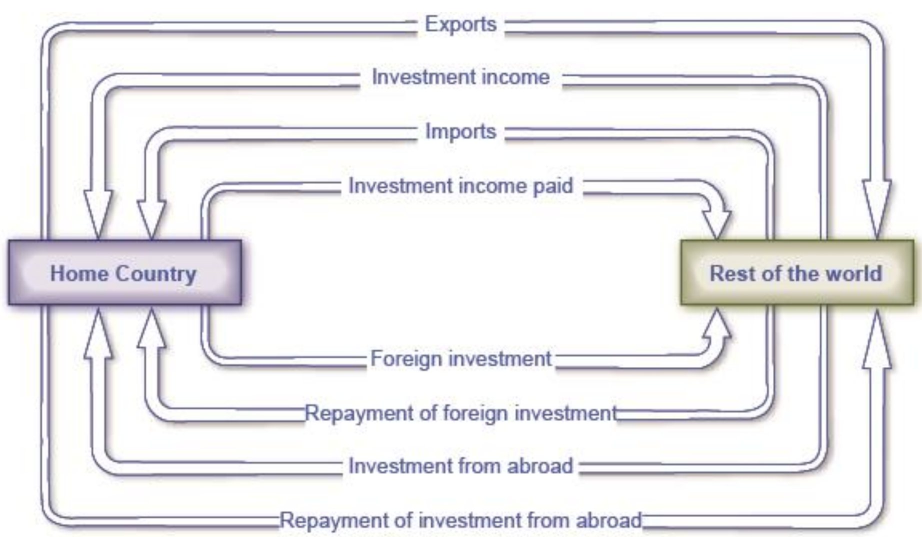
8. State whether each of the following events involves a financial flow to the U.S. economy or away from the U.S. economy:

a. Export sales to Germany
b. Returns being paid on past U.S. financial investments in Brazil
c. Foreign aid from the U.S. government to Egypt
d. Imported oil from the Russian Federation
e. Japanese investors buying U.S. real estate

Solution

a. An export sale to Germany involves a financial flow from Germany to the U.S. economy.
b. The issue here is not U.S. investments in Brazil, but the return paid on those investments, which involves a financial flow from the Brazilian economy to the U.S. economy.
c. Foreign aid from the United States to Egypt is a financial flow from the United States to Egypt.
d. Importing oil from the Russian Federation means a flow of financial payments from the U.S. economy to the Russian Federation.
e. Japanese investors buying U.S. real estate is a financial flow from Japan to the U.S. economy.

9. How does the bottom portion of the following figure, showing the international flow of investments and capital, differ from the upper portion?



Solution: The top portion tracks the flow of exports and imports and the payments for those. The bottom portion is looking at international financial investments and the outflow and inflow of monies from those investments. These investments can include investments in stocks and bonds or real estate abroad, as well as international borrowing and lending.

10. Explain the relationship between a current account deficit or surplus and the flow of funds.

Solution: If more monies are flowing out of the country (for example, to pay for imports) it will make the current account more negative or less positive, and if more monies are flowing into the country, it will make the current account less negative or more positive.

11. Using the national savings and investment identity, explain how each of the following changes (ceteris paribus) will increase or decrease the trade balance:
   a. A lower domestic savings rate
   b. The government changes from running a budget surplus to running a budget deficit
   c. The rate of domestic investment surges

Solution: Write out the national savings and investment identity for the situation of the economy implied by this question:

Supply of capital = Demand for capital

$$S + (M - X) + (T - G) = I$$

Savings + (trade deficit) + (government budget surplus) = Investment

If domestic savings increases and nothing else changes, then the trade deficit will fall. In effect, the economy would be relying more on domestic capital and less on foreign capital. If the government starts borrowing instead of saving, then the trade deficit must rise. In effect, the government is no longer providing savings and so, if nothing else is to change, more investment funds must arrive from abroad. If the rate of domestic investment surges, then, ceteris paribus, the trade deficit must also rise, to provide the extra capital. The ceteris paribus—or "other things being equal"—assumption is important here. In all of these situations, there is no reason to expect in the real world that the original change will affect only, or primarily, the trade deficit. The identity only says that something will adjust—it does not specify what.

12. If a country is running a government budget surplus, why is (T – G) on the left side of the saving-investment identity?

Solution: The government is saving rather than borrowing. The supply of savings, whether private or public, is on the left side of the identity.

13. What determines the size of a country's trade deficit?

Solution: A trade deficit is determined by a country's level of private and public savings and the amount of domestic investment.

14. If domestic investment increases, and there is no change in the amount of private and public saving, what must happen to the size of the trade deficit?

Solution: The trade deficit must increase. To put it another way, this increase in investment must be financed by an inflow of financial capital from abroad.

15. Why does a recession cause a trade deficit to increase?

Solution: Incomes fall during a recession, and consumers buy fewer good, including imports.

16. Both the United States and global economies are booming. Will U.S. imports and/or exports increase?

Solution: A booming economy will increase the demand for goods in general, so import sales will increase. If our trading partners' economies are doing well, they will buy more of our products and so U.S. exports will increase.

17. For each of the following, indicate which type of government spending would justify a budget deficit and which would not.

- **a. Increased federal spending on Medicare**
- **b. Increased spending on education**
- **c. Increased spending on the space program**
- **d. Increased spending on airports and air traffic control**

Solution:

a. Increased federal spending on Medicare may not increase productivity, so a budget deficit is not justified.
b. Increased spending on education will increase productivity for economic growth, so a budget deficit is justified.
c. Increased spending on the space program may not increase productivity, so a budget deficit is not justified.
d. Increased spending on airports and air traffic control will increase productivity and foster greater economic growth, so a budget deficit is justified.

18. How did large trade deficits hurt the East Asian countries in the mid 1980's? (Recall that trade deficits are equivalent to inflows of financial capital from abroad.)

Solution: Foreign investors worried about repayment so they began to pull money out of these countries. The money can be pulled out of stock and bond markets, real estate, and banks.

19. Describe a scenario in which a trade surplus benefits an economy and one in which a trade surplus is occurring in an economy that performs poorly. What key factor or factors are making the difference in the outcome that results from a trade surplus?

Solution: A rapidly growing trade surplus could result from a number of factors, so you would not want to be too quick to assume a specific cause. However, if the choice is between whether the economy is in recession or growing rapidly, the answer would have to be recession. In a recession, demand for all goods, including imports, has declined; however, demand for exports from other countries has not necessarily altered much, so the result is a larger trade surplus.

20. The United States exports 14% of GDP while Germany exports about 50% of its GDP. Explain what that means.

Solution: Germany has a higher level of trade than the United States. The United States has a large domestic economy so it has a large volume of internal trade.

21. Explain briefly whether each of the following would be more likely to lead to a higher level of trade for an economy, or a greater imbalance of trade for an economy.

- **a. Living in an especially large country**
- **b. Having a domestic investment rate much higher than the domestic savings rate**
- **c. Having many other large economies geographically nearby**
- **d. Having an especially large budget deficit**
- **e. Having countries with a tradition of strong protectionist legislation shutting out imports**

Solution

a. A large economy tends to have lower levels of international trade, because it can do more of its trade internally, but this has little impact on its trade imbalance.

b. An imbalance between domestic physical investment and domestic saving (including government and private saving) will always lead to a trade imbalance, but has little to do with the level of trade.
c. Many large trading partners nearby geographically increases the level of trade, but has little impact one way or the other on a trade imbalance.
d. The answer here is not obvious. An especially large budget deficit means a large demand for financial capital which, according to the national saving and investment identity, makes it somewhat more likely that there will be a need for an inflow of foreign capital, which means a trade deficit.
e. A strong tradition of discouraging trade certainly reduces the level of trade. However, it does not necessarily say much about the balance of trade, since this is determined by both imports and exports, and by national levels of physical investment and savings.

Review Questions

22. If imports exceed exports, is it a trade deficit or a trade surplus? What about if exports exceed imports?

Solution: A trade deficit is when imports exceed exports. A trade surplus is when exports exceed imports.

23. What is included in the current account balance?

Solution: Net exports, income from abroad and net current transfers.

24. In recent decades, has the U.S. trade balance usually been in deficit, surplus, or balanced?

Solution: The U.S. trade balance has usually been in deficit.

25. Does a trade surplus mean an overall inflow of financial capital to an economy, or an overall outflow of financial capital? What about a trade deficit?

Solution: A trade surplus means an overall inflow of financial capital, and a trade deficit means an overall outflow of financial capital.

26. What are the two main sides of the national savings and investment identity?

Solution: The demand for capital and the supply of capital.

27. What are the main components of the national savings and investment identity?

Solution: Domestic saving, net exports, government spending and investment.

28. When is a trade deficit likely to work out well for an economy? When is it likely to work out poorly?

Solution: Whether a country experiences a trade deficit or a trade surplus depends on the relationship between domestic saving and investment. If a country is investing more than it's saving, financial capital inflows will finance the investment, and the trade balance will go into deficit. This is not a bad thing since the investment will increase future income. If a country runs a larger budget deficit, the trade balance will also go into deficit, but this time there may be no additional future income. This would be a bad thing.

29. Does a trade surplus help to guarantee strong economic growth?

Solution: No. Sometimes a trade surplus happens when domestic goods become cheaper due to a recession.

30. What three factors will determine whether a nation has a higher or lower share of trade relative to its GDP?

Solution: A large number of trading partners nearby, the overall size of the domestic economy, and political restrictions on trade are three factors which affect the relative size of a country's share of trade.

31. What is the difference between trade deficits and balance of trade?

Solution: Trade deficits are when a country imports more than it exports, whereas balanced trade means these two amounts are equal.

Critical Thinking Questions

32. From time to time, a government official will argue that a country should strive for both a trade surplus and a healthy inflow of capital from abroad. Explain why such a statement is economically impossible.

Solution: To have a trade surplus means that exports exceed imports, so capital flows out of the country rather than into it. In order to be a net importer of capital requires a trade deficit.

33. A government official announces a new policy. The country wishes to eliminate its trade deficit, but will strongly encourage financial investment from foreign firms. Explain why such a statement is contradictory.

Solution: In order for foreign firms to invest in a domestic company, they must sell their currency to someone who wants to use it in exchange of dollars. The excess foreign currency will then be spent on foreign goods and services, increasing imports and widening the trade deficit. In other words, it's not possible to run a capital account surplus (which is what promoting foreign firms' investment implies) without a current account deficit.

34. If a country is a big exporter, is it more exposed to global financial crises?

Solution: Yes, because it depends on the income of other countries being used to purchase its goods and services.

35. If countries reduced trade barriers, would the international flows of money increase?

Solution: Yes, more money would flow internationally because the price of importing and exporting would decrease.

36. Is it better for your country to be an international lender or borrower?

Solution: It is generally better to be a lender, as the country will be able to earn interest payments on its loans.

37. Many think that the size of a trade deficit is due to a lack of competitiveness of domestic sectors, such as autos. Explain why this is not true.

Solution: The trade deficit is the result of high incomes and high labor costs, not a lack of competitiveness. Additionally, the U.S. has a competitive advantage in domestic services that cannot easily be exported.

38. If you observed a country with a rapidly growing trade surplus over a period of a year or so, would you be more likely to believe that the economy of that country was in a period of recession or of rapid growth? Explain.

Solution: It is more likely that the economy is in recession, since the prices of its goods and services would be falling and attracting foreign buyers.

39. From time to time, a government official will argue that a country should strive for both a trade surplus and a healthy inflow of capital from abroad. Is this possible?

Solution: No. A trade surplus requires capital to flow out of the country, whereas an inflow would result in a trade deficit.

40. What is more important, a country's current account balance or the growth of GDP? Why?

Solution: The growth of GDP has a more direct impact on improvements in the standard of living than does the current account balance.

41. Will nations that are more involved in foreign trade tend to have higher trade imbalances, lower trade imbalances, or is the pattern unpredictable?

Solution: There is no obvious pattern. It will depend on the internal features of a country that makes it either likely to be a net exporter or a net importer.

42. Some economists warn that the persistent trade deficits and a negative current account balance that the United States has run will be a problem in the long run. Do you agree or not? Explain your answer.

Solution: The student should provide his or her own opinion.

Problems

43. In 2001, the economy of the United Kingdom exported goods worth £192 billion and services worth another £77 billion. It imported goods worth £225 billion and services worth £66 billion. Receipts of income from abroad were £140 billion while income payments going abroad were £131 billion. Government transfers from the United Kingdom to the rest of the world were £23 billion, while various U.K government agencies received payments of £16 billion from the rest of the world.

a. Calculate the U.K. merchandise trade deficit for 2001.
b. Calculate the current account balance for 2001.
c. Explain how you decided whether payments on foreign investment and government transfers counted on the positive or the negative side of the current account balance for the United Kingdom in 2001.

Solution:

a. The merchandise trade deficit is £225 billion - £192 billion = £33 billion.

b. The current account balance is net exports + net income from abroad + net transfers = (£269 billion - £291 billion) + (£140 billion - £131 billion) + (£16 billion - $23 billion) = -£20 billion.
c. Payments on investment and transfers are counted as a positive because they represent payments to foreigners for services, though in the case of transfers there is no quid pro quo.

38. Imagine that the U.S. economy finds itself in the following situation: a government budget deficit of $100 billion, total domestic savings of $1,500 billion, and total domestic physical capital investment of $1,600 billion. According to the national saving and investment identity, what will be the current account balance? What will be the current account balance if investment rises by $50 billion, while the budget deficit and national savings remain the same?

Solution: Start with a partial national saving and investment identity, filling in the numbers that you have from the problem:

$$\text{Supply of financial capital} = \text{Demand for financial capital}$$
$$\text{Savings} + \text{Current account deficit} = \text{Government borrowing} + \text{Physical investment}$$
$$1{,}500 \text{ billion} + \text{Current account deficit} = 100 \text{ billion} + 1{,}600 \text{ billion}$$

Given the numbers in the problem, it must be that there is an inflow of an additional $200 billion so that the national savings and investment identity will hold:

$$\text{Savings} + \text{Current account deficit} = \text{Government borrowing} + \text{Physical investment}$$
$$1{,}500 \text{ billion} + 200 \text{ billion} = 100 \text{ billion} + 1{,}600 \text{ billion}$$

Hence, if investment increases by $50 billion while savings and government borrowing remain the same, the current account deficit must increase to $250 billion.

39. The following table provides some hypothetical data on macroeconomic accounts for three countries represented by A, B, and C and measured in billions of currency units. In Table 10_07, private household saving is SH, tax revenue is T, government spending is G, and investment spending is I.

	A	B	C
SH	700	500	600
T	00	500	500
G	600	350	650
I	800	400	450

a. Calculate the trade balance (E – Z) and the net inflow of foreign saving (SF) for each country.
b. State whether each one has a trade surplus or deficit (or balanced trade).
c. State whether each is a net lender or borrower internationally and explain.

Solution:

a. Country A: The current account balance is SH + (T - G) + (E - Z) = I; (E - Z) = I - SH - (T - G) = 800 - 700 - (0 - 600) = 700. Country B: (E - Z) = 400 - 500 - (500 - 350) = -250. Country C: (E - Z) = 450 - 600 - (500 - 650) = 0.
b. Country A has a trade surplus. Country B has a trade deficit. Country C has balanced trade.
c. Country A is a borrower, as it runs a government budget deficit. Country B is a lender, as it runs a government budget surplus. Country has a balanced budget and is neither a borrower nor a lender.

40. Imagine that the economy of Germany finds itself in the following situation: the government budget has a surplus of 1% of Germany's GDP; private savings is 20% of GDP; and physical investment is 18% of GDP.

a. Based on the national saving and investment identity, what is the current account balance?

b. If the government budget surplus falls to zero, how will this affect the current account balance?

Solution:

a. Write the identity: S + (X - M) + (T - G) = I; from this we can see that net exports are: (X - M) = I - S - (T - G) = 18% - 20% - 1% = -3% of GDP. So the current account balance is -3% of GDP, assuming no income from abroad or net transfers, which are not given in the problem. In other words, Germany is running a current account deficit of 3% of GDP.

b. If the government surplus falls to zero, the current account balance will be -2% of GDP instead of -3%.

CHAPTER 11: THE AGGREGATE DEMAND/AGGREGATE SUPPLY MODEL

Self-Check Questions

1. Describe the mechanism by which supply creates its own demand

Solution: In order to supply goods, suppliers must employ workers, whose incomes increase as a result of their labor. They use this additional income to demand goods of an equivalent value to those they supply.

2. Describe the mechanism by which demand creates its own supply.

Solution: When consumers demand more goods than are available on the market, prices are driven higher and the additional opportunities for profit induce more suppliers to enter the market, producing an equivalent amount to that which is demanded.

3. The aggregate supply curve was constructed assuming that as the price of out puts increases, the price of inputs stays the same. How would an increase in the prices of important inputs, like energy, affect aggregate supply?

Solution: Higher input prices make output less profitable, decreasing the desired supply. This is shown graphically as a leftward shift in the AS curve.

4. In the AD/AS model, what prevents the economy from achieving equilibrium at potential output?

Solution: Equilibrium occurs at the level of GDP where AD = AS. Insufficient aggregate demand could explain why the equilibrium occurs at a level of GDP less than potential. A decrease (or leftward shift) in aggregate supply could be another reason.

5. Suppose the U.S. Congress passes significant immigration reform that makes it easier for foreigners to come to the United States to work. Use the AD/AS model to explain how this would affect the equilibrium level of GDP and the price level.

Solution: Immigration reform as described should increase the labor supply, shifting AS to the right, leading to a higher equilibrium GDP and a lower price level.

6. Suppose concerns about the size of the federal budget deficit lead the U.S. Congress to cut all funding for research and development for ten years. Assuming this has an impact on technology growth, what does the AD/AS model predict would be the likely effect on equilibrium GDP and the price level?

Solution: Given the assumptions made here, the cuts in R&D funding should reduce productivity growth. The model would show this as a leftward shift in the AS curve, leading to a lower equilibrium GDP and a higher price level.

7. How would a dramatic increase in the stock market shift the AD curve? What effect would the shift have on the equilibrium level of GDP and the price level?

Solution: An increase in the value of the stock market would make individuals feel wealthier and thus more confident about their economic situation. This would likely cause an increase in consumer confidence leading to an increase in consumer spending, shifting the AD curve to the right. The result would be an increase in the equilibrium level of GDP and an increase in the price level.

8. Suppose Mexico, one of our largest trading partners and purchaser of a large quantity of our exports, goes into a recession. Use the AD/AS model to determine the likely impact on our equilibrium GDP and price level.

Solution: Since imports depend on GDP, if Mexico goes into recession, its GDP declines and so do its imports. This decline in our exports can be shown as a leftward shift in AD, leading to a decrease in our GDP and price level.

9. A policymaker claims that tax cuts led the economy out of a recession. Can we use the AD/AS diagram to show this?

Solution: Tax cuts increase consumer and investment spending, depending on where the tax cuts are targeted. This would shift AD to the right, so if the tax cuts occurred when the economy was in recession (and GDP was less than potential), the tax cuts would increase GDP and "lead the economy out of recession."

10. Many financial analysts and economists eagerly await the press releases for the reports on the home price index and consumer confidence index. What would be the effects of a negative report on both of these? What about a positive report?

Solution: A negative report on home prices would make consumers feel like the value of their homes, which for most Americans is a major portion of their wealth, has declined. A negative report on consumer confidence would make consumers feel pessimistic about the future. Both of these would likely reduce consumer spending, shifting AD to the left, reducing GDP and the price level. A positive report on the home price index or consumer confidence would do the opposite.

11. What impact would a decrease in the size of the labor force have on GDP and the price level according to the AD/AS model?

Solution: A smaller labor force would be reflected in a leftward shift in AS, leading to a lower equilibrium level of GDP and higher price level.

12. Suppose after five years of sluggish growth, the economy of the European Union picks up speed. What would be the likely impact on the U.S. trade balance, GDP, and employment?

Solution: Higher EU growth would increase demand for U.S. exports, reducing our trade deficit. The increased demand for exports would show up as a rightward shift in AD, causing GDP to rise (and the price level to rise as well). Higher GDP would require more jobs to fulfill, so U.S. employment would also rise.

13. Suppose the Federal Reserve begins to increase the supply of money at an increasing rate. What impact would that have on GDP, unemployment, and inflation?

Solution: Expansionary monetary policy shifts AD to the right. A continuing expansionary policy would cause larger and larger shifts (given the parameters of this problem). The result would be an increase in GDP and employment (a decrease in unemployment) and higher prices until potential output was reached. After that point, the expansionary policy would simply cause inflation.

14. If the economy is operating in the neoclassical zone of the SRAS curve and aggregate demand falls, what is likely to happen to real GDP?

Solution: Since the AS curve is vertical in the neoclassical zone, unless the economy is bordering the intermediate zone, a decrease in AS will cause a decrease in the price level, but no effect on real economic activity (i.e., real GDP or employment).

15. If the economy is operating in the Keynesian zone of the SRAS curve and aggregate demand falls, what is likely to happen to real GDP?

Solution: Because the AS curve is horizontal in the Keynesian zone, a decrease in AD should depress real economic activity but have no effect on prices.

Review Questions

16. What is Say's law?

Solution: Say's law states that supply creates its own demand.

17. What is Keynes' law?

Solution: Keynes law states that demand creates its own supply.

18. Do neoclassical economists believe in Keynes' law or Say's law?

Solution: Neoclassical economists tend to believe in Say's law.

19. Does Say's law apply more accurately in the long run or the short run? What about Keynes' law?

Solution: Say's law applies more accurately to the long run, while Keynes' law applies more accurately to the short run.

20. What is on the horizontal axis of the AD/AS diagram? What is on the vertical axis?

Solution: The horizontal axis shows the aggregate level of output, while the vertical axis shows the aggregate price level.

21. What is the economic reason why the SRAS curve slopes up?

Solution: As prices rise, suppliers will see greater profit opportunities and increase production.

22. What are the components of the aggregate demand (AD) curve?

Solution: Consumption, investment, net exports and government spending.

23. What are the economic reasons why the AD curve slopes down?

Solution: The AD curve slopes downward from left to right because of the wealth effect, the interest rate effect and the foreign price effect. The wealth effect refers to the fact that a lower price level one's savings or wealth purchases more goods and services. This increase in wealth causes an increase in spending. The interest rate effect is that with a lower price level, the demand for money declines, lowering interest rates and stimulating investment spending. The foreign price effect is that if the price level decreases (relative to prices in the rest of the world), demand for exports increases, and demand for imports decreases stimulating aggregate demand.

24. Briefly explain the reason for the near-horizontal shape of the SRAS curve on its far left.

Solution: Since the economy is producing an output far below potential GDP, it is easy to increase production in response to a small price change.

25. Briefly explain the reason for the near-vertical shape of the SRAS curve on its far right.

Solution: Since all of the economy's resources are already fully employed, it is difficult to increase supply further, even in response to a large price change.

26. What is potential GDP?

Solution: Potential GDP is the output an economy can achieve when its resource are fully employed.

27. Name some factors that could cause the SRAS curve to shift, and say whether they would shift AS to the right or to the left.

Solution: A natural disaster or lack of availability of inputs could shift the AS curve to the left, while a new production technology could shift it to the right.

28. Will the shift of SRAS to the right tend to make the equilibrium quantity and price level higher or lower? What about a shift of SRAS to the left?

Solution: A shift to the right will tend to reduce prices and increase quantity, while a shift to the left will do the reverse.

29. What is stagflation?

Solution: Stagflation occurs when an economy sees reductions in output and rising prices at the same time.

30. Name some factors that could cause AD to shift, and say whether they would shift AD to the right or to the left.

Solution: An increase in consumer confidence could cause AD to shift right, while a higher level of taxation could cause it to shift left.

31. Would a shift of AD to the right tend to make the equilibrium quantity and price level higher or lower? What about a shift of AD to the left?

Solution: Increase prices and quantity, while a shift to the left will decrease both prices and quantity

32. How is long-term growth illustrated in an AD/AS model?

Solution: Long term growth is shown by the increase of potential GDP, represented by a vertical line.

33. How is recession illustrated in an AD/AS model?

Solution: A recession is a temporary shift of the aggregate equilibrium to below potential GDP.

34. How is cyclical unemployment illustrated in an AD/AS model?

Solution: Cyclical unemployment is illustrated by how close the equilibrium is to potential output.

35. How is the natural rate of unemployment illustrated in an AD/AS model?

Solution: The natural rate of unemployment occurs at potential GDP, represented by a vertical line.

36. How is pressure for inflationary price increases shown in an AD/AS model?

Solution: Shifts in the AS and AD curve that bring the equilibrium into the steep portion of the AS curve show inflationary pressure.

37. What are some of the ways in which exports and imports can affect the AD/AS model?

Solution: An increase in net exports can increase aggregate demand, shifting it to the right and resulting in increased outputs and employment, as well as higher prices.

38. What is the Keynesian zone of the AS curve? How much is the price level likely to change in the Keynesian zone?

Solution: The Keynesian zone is the flat portion of the supply curve, so price levels tend not to be very responsive to shifts in supply.

39. What is the neoclassical zone of the AS curve? How much is the output level likely to change in the neoclassical zone?

Solution: The neoclassical zone of the AS curve is the vertical portion of the curve, where shifts have little effect on output.

40. What is the intermediate zone of the AS curve? Will a rise in output be accompanied by a rise or a fall in the price level in this zone?

Solution: The intermediate zone of the AS curve is where the curve is upward sloping without becoming either horizontal or vertical. Expansions in output result in falling prices in this zone.

Critical Thinking Questions

41. Why would an economist choose either the neoclassical perspective or the Keynesian perspective, but not both?

Solution: These two perspectives are contradictory in terms of policy positions, and cannot both be held simultaneously.

42. On a microeconomic demand curve, a decrease in price causes an increase in quantity demanded because the product in question is now relatively less expensive than substitute products. Explain why aggregate demand does not increase for the same reason in response to a decrease in the aggregate price level. In other words, what causes total spending to increase if it's not because goods are now cheaper?

Solution: The buying power of existing savings and wages is still affected by changes in the price level, so a lower aggregate price level makes consumers relatively wealthier and more likely to consume more.

43. In July, 2013 the consulting firm Mercer released results from a survey where workers in the U.S. expected a 2.9% increase in pay in 2014. Assuming this occurs and it was the only development in the labor market that year, how would this affect the AS curve? What if it was also accompanied by an increase in worker productivity?

Solution: Labor is an input, so a higher price would tend to shift AS to the left. However, this could be balanced out by a simultaneous increase in worker productivity.

44. If new government regulations require firms to use a cleaner technology that is also less efficient than what was previously used, what would the effect be on output, the price level, and employment using the AD/AS diagram?

Solution: This would make production more expensive and result in a leftward shift in the AS curve, causing higher prices, less output and less employment.

45. During the spring of 2014 the Midwestern U.S., which has a large agricultural base, experiences above-average rainfall. Using the AD/AS diagram, what is the effect on output, the price level, and employment?

Solution: This would increase crop yields and shift the AS curve to the right, resulting in lower prices, higher output and higher employment.

46. Hydraulic fracturing (fracking) has the potential to significantly increase the amount of natural gas produced in the United States. If a large percentage of factories and utility companies use natural gas, what will happen to output, the price level, and employment?

Solution: This would be a rightward shift in the AS curve, resulting in lower prices, higher output and higher employment.

47. Some politicians have suggested tying the minimum wage to the consumer price index (CPI). Using the AD/AS diagram, what effects would this policy most likely have on output, the price level, and employment?

Solution: Increases in the minimum wage raise the cost of labor, shifting aggregate supply to the left and cause upward pressure on prices, while reducing output and employment. The increase in prices (e.g. the CPI) would then cause additional increases in the minimum wage and so create a wage-price spiral, continually keeping output below potential and employment less than full.

There may also be an effect on aggregate demand as workers have more money to spend, which could shift aggregate demand to the right, which would tend to add to higher prices, higher output and greater employment. Without knowing the magnitudes of these effects, we cannot say for sure what would happen to output and employment, but prices will face continuous upward pressure from both the supply and demand side.

48. If households decide to save a larger portion of their income, what effect would this have on the output, employment, and price level in the short run? What about the long run?

Solution: In the short run, this would be a leftward shift of AD, and result in reduced prices, output and employment. In the long run, it would most likely result in a rightward shift in supply, as firms took advantage of the increased availability of loanable fund to make investments in capital and technology. This would lead to lower prices, more output and more employment.

49. If firms become more optimistic about the future of the economy and at the same time innovation in 3-D printing makes most workers more productive, what is the combined effect on output, employment, and the price-level?

Solution: Both of these effects shift supply to the right, resulting in lower prices, more output and more employment.

50. If Congress cuts taxes at the same time that businesses become more pessimistic about the economy, what is the combined effect on output, the price level, and employment using the AD/AS diagram?

Solution: The tax cut will shift AD to the right, while the pessimism by businesses will shift AS to the left, resulting in an ambiguous change in output and employment, but certain to cause higher prices.

51. Suppose the level of structural unemployment increases. How would the increase in structural unemployment be illustrated in the AD/AS model? *Hint:* How does structural unemployment affect potential GDP?

Solution: An increase in structural unemployment likely result in a leftward shift in aggregate demand, as unemployed workers saw their incomes drop. This would bring the economy into equilibrium at a point below potential GDP. Structurally unemployed workers are not being employed to their full potential, so their presence always indicates a level of output below potential GDP.

52. If foreign wealth holders decide that the United States is the safest place to invest their savings, what would the effect be on the economy here? Show graphically using the AD/AS model.

Solution: This would be a rightward shift in the aggregate demand curve, as foreign investors spend their money domestically. The result is higher prices, more output and more employment.

53. The AD/AS model is static. It shows a snapshot of the economy at a given point in time. Both economic growth and inflation are dynamic phenomena. Suppose economic growth is 3% per year and aggregate demand is growing at the same rate. What does the AD/AS model say the inflation rate should be?

Solution: The answer depends on the shape of the aggregate supply curve, since the inflation rate is measured by changes in the price level over time. If aggregate supply increases along with demand, there will be no inflation.

54. Explain why the short-run aggregate supply curve might be fairly flat in the Keynesian zone of the AS curve. How might we tell if we are in the Keynesian zone of the AS?

Solution: The Keynesian zone of the AS curve assumes that an economy is producing at a level below potential GDP, so shifts in supply are reflected mainly by output rather than prices.

55. Explain why the short-run aggregate supply curve might be vertical in the neoclassical zone of the AS curve. How might we tell if we are in the neoclassical zone of the AS?

Solution: The neoclassical zone of the AS curve assumes that the economy is operating at near-potential GDP. Since resources are already fully employed, increases in supply tend to be reflected by higher prices more than increases n output.

56. Why might it be important for policymakers to know which zone of the AS curve the economy is in?

Solution: The effect of an economic stimulus will vary considerably depending on which zone of the AS curve the economy is currently in.

57. In your view, is the economy currently operating in the Keynesian, intermediate or neoclassical portion of the economy's aggregate supply curve?

Solution: Exercise left to the student, since economic conditions will vary based on the time at which this is read.

58. Are Say's law and Keynes' law necessarily mutually exclusive?

Solution: They are not mutually exclusive if we examine different time horizons. Keynes' law tends to reflect the short run, while Say's law tends to reflect the long run.

Problems

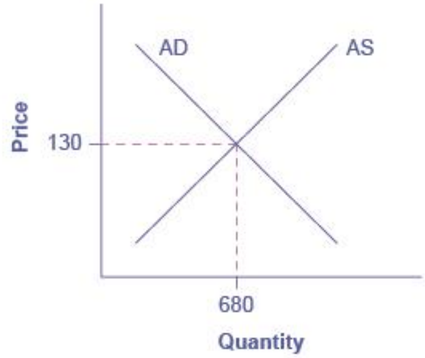
59. Review the problem shown in the Work it Out titled "Interpreting the AD/AS Model." Like the information provided in that feature, the table below shows information on aggregate supply, aggregate demand and the price level for the imaginary country of Xurbia.

Price Level	AD	AS
110	700	600
120	690	640
130	680	680
140	670	720
150	660	740
160	650	760
170	640	770

a. Plot the AD/AS diagram from the data shown. Identify the equilibrium.
b. Imagine that as a result of a government tax cut, aggregate demand becomes higher by 50 at every price level. Identify the new equilibrium.
c. How will the new equilibrium alter output? How will it alter the price level? What do you think will happen to employment?

Solution:

a. The equilibrium occurs at a price level of 130, where Aggregate Supply equals Aggregate Demand.

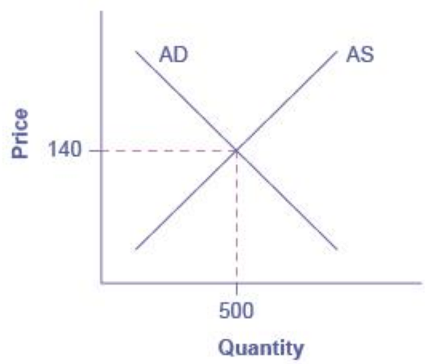


b. The new equilibrium would occur at a price level of 140.
c. Output will increase, prices will be higher, and unemployment will decline as the economy nears potential GDP.

60. The imaginary country of Harris Island has the aggregate supply and aggregate demand curves as shown in the table below.

Price Level	AD	AS
100	700	200
120	600	325
140	500	500
160	400	570
180	300	620

a. Plot the AD/AS diagram. Identify the equilibrium.



b. Would you expect unemployment in this economy to be relatively high or low?
c. Would you expect concern about inflation in this economy to be relatively high or low?
d. Imagine that consumers begin to lose confidence about the state of the economy, and so AD becomes lower by 275 at every price level. Identify the new aggregate equilibrium.
e. How will the shift in AD affect the original output, price level and employment?

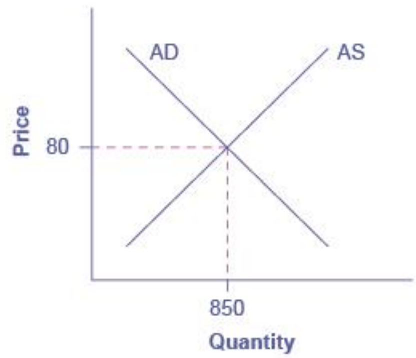
Solution:

a. The equilibrium occurs at a price level of 140.
b. Unemployment would be high because the economy is producing at well below potential GDP, as we can see from the flat shape of the AS curve at equilibrium.
c. Concerns about inflation should be relatively low, because small increases in price lead to high increases in output and thus employment.
d. The new equilibrium would occur at a price level of 120.
e. Prices will decline, output will decline and employment will decline as well.

61. Santher is an economy described by the table below.

Price Level	AD	AS
50	1,000	250
60	950	580
70	900	750
80	850	850
90	800	900

a. Plot the AD/AS curves and identify the equilibrium.



b. Would you expect unemployment in this economy to be relatively high or low?
c. Would you expect prices to be a relatively large or small concern for this economy?
d. Imagine that input prices fall and so AS shifts to the right by 150 units. Identify the new equilibrium.
e. How will the shift in AS affect the original output, price level and employment?

Solution:

a. The equilibrium occurs at a price level of 80.
b. Unemployment should be high, due to the flat shape of the AS curve at equilibrium.
c. Prices of outputs are much too low and should be a major concern.
d. The new equilibrium occurs at a price level of 70.
e. Prices will fall, but employment and output will rise since the price shift was driven by input prices and not a drop in demand.

CHAPTER 12: THE KEYNESIAN PERSPECTIVE

Self-Check Questions

1. In the Keynesian framework, which of the following event might cause a recession? Which might cause inflation? Sketch AD/AS diagrams to illustrate your answers.

- **a. A large increase the price of the homes that people own.**
- **b. Rapid growth in the economy of a major trading partner.**
- **c. The development of a major new technology offers profitable opportunities for business.**
- **d. The interest rate rises.**
- **e. The good imported from a major trading partner become much less expensive.**

Solution

- a. AD will shift to the right and may cause inflation if it goes beyond potential GDP.
- b. AD will shift to the right and may cause inflation if it goes beyond potential GDP.
- c. AD will shift to the right and may cause inflation if it goes beyond potential GDP.
- d. AD will shift to the left and may cause recession if it goes beyond potential GDP.
- e. Demand for cheaper imports increase reducing demand for domestic products. AD will shift to left and may be recessionary.

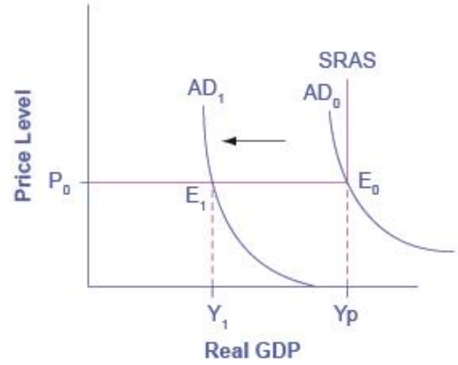
2. In a Keynesian framework, using an AD/AS diagram, which of the following government policy choices offer a possible solution to a recession? Which offer a possible solution to inflation?

- **a. A tax increase on consumer income.**
- **b. A surge in military spending**
- **c. A reduction in taxes for businesses that increase investment**
- **d. Major reduction in what the U.S. government spends on health care outlays**

Solution

- a. A tax increase on consumer income will cause consumption to fall, pushing the AD curve left and is a possible solution to inflation.
- b. A surge in military spending is an increase in government spending. This will cause the AD curve to shift to the right. If the Real GDP is less than Potential GDP then this spending would pull the economy out of a recession. If the Real GDP is to the right of Potential GDP, then the AD curve will shift further to the right and military spending will be inflationary.
- c. At tax cut focused on business investment will shift AD to the right. If the original Macroeconomic equilibrium is below potential GDP, then this policy can help move an economy out of a recession.
- d. Government spending on health care will cause the AD curve to shift to the right. If the Real GDP is less than Potential GDP then this spending would pull the economy out of a recession. If the Real GDP is to the right of Potential GDP, then the AD curve will shift further to the right and military spending will be inflationary.

3. Use the AD/AS model to explain how an inflationary gap occurs, beginning from the initial equilibrium in the following figure.



Solution: An inflationary gap is the result of an increase in aggregate demand when the economy is at potential output. Since the AS curve is vertical at potential GDP, any increase in AD will lead to a higher price level (i.e. inflation) but no higher real GDP. This is easy to see if you draw AD_1 to the right of AD_0.

4. Suppose the U.S. congress cuts federal government spending in order to balance the Federal budget. Use the AD/AS model to analyze the likely impact on output and employment. *Hint*: revisit the figure in Exercise 25.3.

Solution: A decrease in government spending will shift AD to the left.

5. How would a decrease in energy prices affect the Phillips curve?

Solution: A decrease in energy prices, a positive supply shock, would cause the AS curve to shift out to the right, yielding more real GDP at a lower price level. This would shift the Phillips curve down toward the origin, meaning the economy would experience lower unemployment and a lower rate of inflation.

6. Does Keynesian economics require government to set controls on prices, wages, or interest rates?

Solution: Keynesian economics doesn't require microeconomic price controls of any sort. It is true that many Keynesian economic prescriptions were for the government to influence the total amount of aggregate demand in the economy, often through government spending and tax cuts.

7. List three practical problems with the Keynesian perspective.

Solution: The three problems center on government's ability to estimate of potential GDP, decide whether to influence aggregate demand through tax changes or changes in government spending, and the lag time that occurs as Congress and the President attempt to pass legislation.

Review Questions

8. Name some economic events, not related to government policy, which could cause aggregate demand to shift.

Solution: A change in consumer confidence, a relative increase in prices in foreign countries, or a sudden decrease in population could cause aggregate demand to shift.

9. Name some government policies that could cause aggregate demand to shift.

Solution: Changes in income tax rates or restrictions on free trade could cause aggregate demand to shift.

10. From a Keynesian point of view, which is more likely to cause a recession: aggregate demand or aggregate supply and why?

Solution: Aggregate demand is more likely to cause a recession, due to fluctuations in confidence known as the "animal spirits."

11. Why do sticky wages and prices increase the impact of an economic downturn on unemployment and recession?

Solution: Since wages and prices cannot adjust quickly, markets cannot come into equilibrium, and labor surpluses (unemployment) results.

12. Explain what economists mean by "menu costs."

Solution: Menu costs are the costs to seller of rapidly changing their prices.

13. What tradeoff is shown by a Phillips curve?

Solution: The short run tradeoff between inflation and unemployment.

14. Would you expect to see long-run data trace out a stable downward-sloping Phillips curve?

Solution: No, the Phillips curve describes a short run phenomenon. In the long run, there is no trade-off between inflation and unemployment. In other words, the Phillips curve is vertical at the natural rate of unemployment.

15. What is the Keynesian prescription for recession? For inflation?

Solution: Keynesians prescribe increasing aggregate demand through government spending during recession and reducing aggregate demand through reductions in spending during inflationary periods.

16. How did the Keynesian perspective address the economic market failure of the Great Depression?

Solution: The Keynesian perspective holds that the Great Depression was caused by falling aggregate demand, and endorsed the stimulative fiscal policies of FDR to attempt to boost aggregate demand and restore the economy to potential GDP.

Critical Thinking Questions

17. In its recent report, The Conference Board's Global Economic Outlook 2013, Updated May 2013 (http://www.conference-board.org/data/globaloutlook.cfm) projects China's growth between 2014 and 2018 to be just under eight percent. International Business Times (http://www.ibtimes.com/us-exports-china-have-grown-294-over-past-decade-1338693) reports that China is the U.S. third largest export market with exports to China growing 294% over the last ten years. Explain what impact China has on the U.S. economy?

Solution: From a Keynesian perspective, the cheap goods we import from China detract from our aggregate demand and reduce the amount of economic output and employment at home.

18. What may happen if growth in China continues or contracts?

Solution: If China continues to grow, their goods should become relatively more expensive and we can expect to import fewer of them. If the growth contracts, prices should fall and we would import more from China.

19. Does it make sense that wages would be sticky downwards but not upwards? Why or Why not?

Solution: Wages tend to be stickier in the downward direction, because employees are often unwilling to take a pay cut. There is a strong psychological resistance to wage decreases, whereas wage increases have no such issue.

20. Suppose the economy is operating at potential GDP when it experiences an increase in export demand. How might the economy increase production of exports to meet this demand, given that the economy is already at full employment?

Solution: The economy could shift away from domestic production, or the price level could simply rise.

21. Do you think the Phillips Curve is a useful tool for analyzing the economy today? Why or why not?

Solution: The 1970s taught us that we can have both high inflation and high unemployment. More recently, however, we have seen relatively low inflation accompanying high unemployment, so the Phillips Curve may be useful.

22. Return to the table at the Bureau of Economic Analysis in the Work It Out feature titled "The Phillips Curve in the United States. How would you expect government spending to have changed over the last six years?

Solution: You would have expected government spending to contract slightly as the economy began to recover from the Great Recession.

23. Explain what types of policies the Federal government may have implemented to restore aggregate demand and the potential obstacles policymakers may have encountered.

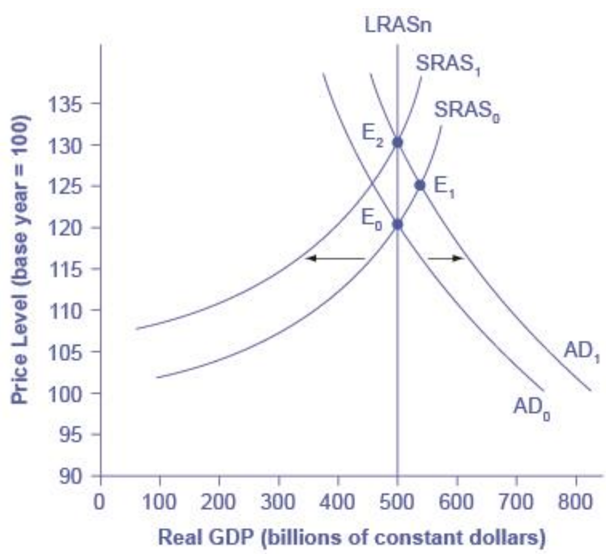
Solution: Some policies have included subsidies to struggling industries such as automobiles and banks, while others have involved direct government spending on infrastructure projects, as well as extended unemployment benefits. Policymakers have encountered resistance on these ideas both on the grounds of fairness and worries over the widening budget deficit.

CHAPTER 13: THE NEOCLASSICAL PERSPECTIVE

1. Do rational expectations tend to look back at past experience while adaptive expectations look ahead to the future? Explain your answer.

Solution: No, this statement is false. It would be more accurate to say that rational expectations seek to predict the future as accurately as possible, using all of past experience as a guide. Adaptive expectations are largely backward looking; that is, they adapt as experience accumulates, but without attempting to look forward.

2. Legislation proposes that the government should use macroeconomic policy to achieve an unemployment rate of zero percent, by increasing aggregate demand for as much and as long as necessary to accomplish this goal. From a neoclassical perspective, how will this policy affect output and the price level in the short run and in the long run? Sketch an aggregate demand/aggregate supply diagram to illustrate your answer. *Hint*: consult the following figure that appeared earlier in this chapter.



Solution: An unemployment rate of zero percent is presumably well below the rate that is consistent with potential GDP and with the natural rate of unemployment. As a result, this policy would be attempting to push AD out to the right. In the short run, it might be possible to have unemployment slightly below the natural rate for a time, at a price of higher inflation, as shown by the movement from E0 to E1 along the short-run AS curve. However, over time the extremely low unemployment rates will tend to cause wages to be bid up, and shift the short-run AS curve back to the left. The result would be a higher price level, but an economy still at potential GDP and the natural rate of unemployment, as determined by the long-run AS curve. If the government continues this policy, it will continually be pushing the price level higher and higher, but it will not be able to achieve its goal of zero percent unemployment, because that goal is inconsistent with market forces.

3. Would it make sense to argue that rational expectations economics is an extreme version of neoclassical economics? Explain.

Solution: The statement is accurate. Rational expectations can be thought of as a version of neoclassical economics because it argues that potential GDP and the rate of unemployment are shaped by market forces as wages and prices adjust. However, it is an "extreme" version because it argues that this adjustment takes place very quickly. Other theories, like adaptive expectations, suggest that adjustment to the neoclassical outcome takes a few years.

4. Summarize the Keynesian and Neoclassical models.

Solution: The short-term Keynesian model is built on the importance of aggregate demand as a cause of business cycles and a degree of wage and price rigidity, and thus does a sound job of explaining many recessions and why cyclical unemployment rises and falls. The neoclassical model emphasizes aggregate supply by focusing on the underlying determinants of output and employment in markets, and thus tends to put more emphasis on economic growth and how labor markets work.

Review Questions

5. Does neoclassical economics focus on the long term or the short term? Explain your answer.

Solution: Neoclassical economics focuses on the long term, where all factors have time to adjust to changing conditions.

6. Does neoclassical economics view prices and wages as sticky or flexible? Why?

Solution: Neoclassical economics views prices and wages as flexible, because it focuses on the long term where all factors are flexible.

7. What shape is the long-run aggregate supply curve? Why does it have this shape?

Solution: The long run aggregate supply curve is vertical, because in the long run output depends on the factors of production, not on prices.

8. What is the difference between rational expectations and adaptive expectations?

Solution: Rational expectations attempt to predict outcomes based on all the currently available information, whereas adaptive expectations make predictions based on what has happened in the past.

9. A neoclassical economist and a Keynesian economist are studying the economy of Vineland. It appears that Vineland is beginning to experience a mild recession with a decrease in aggregate demand. Which of these two economists would likely advocate that the government of Vineland take active measures to reverse this decline in aggregate demand? Why?

Solution: The Keynesian would argue that aggregate demand needs to be stimulated, whereas the neoclassical economist would argue that the economy is undergoing a necessary correction and should be left alone

10. Do neoclassical economists tend to focus more on long term economic growth or on recessions? Explain briefly.

Solution: On long term economic growth, which they believe we can control through policy. On the other hand, they believe that there is little we can do to eliminate recessions.

11. Do neoclassical economists tend to focus more on cyclical unemployment or on inflation? Explain briefly.

Solution: On inflation. Attempts to correct cyclical unemployment will only result in inflation, whereas inflation itself can be tremendously damaging to an economy.

12. Do neoclassical economists see a value in tolerating a little more inflation if it brings additional economic output? Explain your answer.

Solution: In general, neoclassical economists would reject this view, since the additional economic output would only be a short term bubble, that would ultimately revert to the natural level, bringing economic pain with it.

13. If aggregate supply is vertical, what role does aggregate demand play in determining output? In determining the price level?

Solution: Aggregate demand will not determine output, but only changes in the price level.

14. What is the shape of the neoclassical long-run Phillips curve? What assumptions are made that lead to this shape?

Solution: The curve would be vertical, since the natural rate of unemployment is unaffected by prices.

15. When the economy is experiencing a recession, would a neoclassical economist argue for aggressive policy to stimulate aggregate demand and return the economy to full employment? Explain your answer.

Solution: No, a neoclassical economist would not advise such a policy, for fear that it would simply result in a higher price level without corresponding increases in output.

16. If the economy is suffering through a rampant inflationary period, would a Keynesian economist advocate for stabilization policy that involves higher taxes and higher interest rates? Explain your answer

Solution: Yes, higher taxes and higher interest rates would reduce aggregate demand and encouraging saving instead of consumption, shifting AD to the left and reducing prices.

Critical Thinking Questions

17. If most people have rational expectations, how long will recessions last?

Solution: If people have rational expectations, they will expect prices to fall immediately, so prices will fall, minimizing the duration of recessions. In a world of perfect rational expectations, the economy will exhibit no business cycles at all, always operating at potential GDP and full employment.

18. Explain why the neoclassical economists believe that nothing much need be done about unemployment. Do you agree or disagree? Explain.

Solution: Neoclassical economists argue that government policies cannot affect long run output, but only result in changes in the price level. By attempting to increase employment through stimulus, they would argue that inflation will result with no long run increase in employment or output.

19. The American Recovery and Reinvestment Act was criticized by economists from all theoretical persuasions. The "Stimulus Package" was arguably a Keynesian measure so why would a Keynesian economist be critical? Why would neoclassical economists be critical?

Solution: Keynesians criticized the package for not being large enough to have the desired effect. Neoclassical economists criticized it for having the potential to cause vast amounts of inflation and, since it is not possible to boost long run output through spending, creating another bubble just like the one that caused the Great Recession.

20. Is it a logical contradiction to be a neoclassical Keynesian? Explain.

Solution: This can happen if one takes the Keynesian position in the short run and the neoclassical position in the long run.

Problems

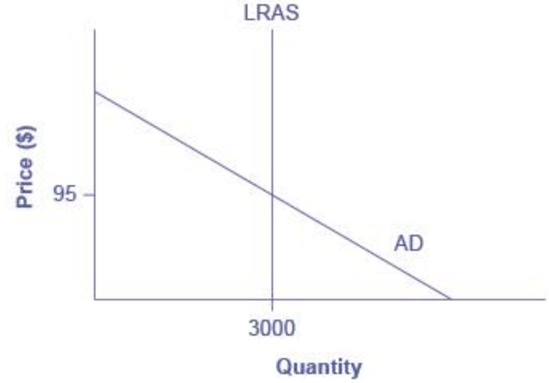
21. The following table to answer the following questions.

Price Level	Aggregate Supply	Aggregate Demand
90	3000	3500
95	3000	3000
100	3000	2500
105	3000	2200
110	3000	2100

a. Sketch an aggregate supply and aggregate demand diagram.
b. What is the equilibrium output and price level?
c. If aggregate demand shifts right, what is equilibrium output?
d. If aggregate demand shifts left, what is equilibrium output?
e. In this scenario, would you suggest using aggregate demand to alter the level of output or to control any inflationary increases in the price level?

Solution:

a. Sketch the graph by plotting the points given in table.



b. Equilibrium output is 3000 and the price level is 95.
c. Equilibrium output remains at 3000.
d. Equilibrium output remains at 3000.
e. Shifts in aggregate demand cannot affect the output level, but could be used to alter the price level.

CHAPTER 14: MONEY AND BANKING

Self-Check Questions

1. In many casinos, a person buys chips to use for gambling. Within the walls of the casino, these chips can often be used to buy food and drink or even a hotel room. Do chips in a gambling casino serve all three functions of money?

Solution: As long as you remain within the walls of the casino, chips fit the definition of money; that is, they serve as a medium of exchange, a unit of account, and a store of value. Chips do not work very well as money once you leave the casino, but many kinds of money do not work well in other areas. For example, it is hard to spend money from Turkey or Brazil at your local supermarket or at the movie theater.

2. Can you name some item that is a store of value, but does not serve the other functions of money?

Solution: Many physical items that a person buys at one time but may sell at another time can serve as an answer to this question. Examples include a house, land, art, rare coins or stamps, and so on.

3. If you are out shopping for clothes and books, what is easiest and most convenient for you to spend: M1 or M2? Explain your answer.

Solution: The currency and checks in M1 are easiest to spend. It is harder to spend M2 directly, although if there is an automatic teller machine in the shopping mall, you can turn M2 from your savings account into an M1 of currency quite quickly. If your answer is about "credit cards," then you are really talking about spending M1—although it is M1 from the account of the credit card company, which you will repay later when you credit card bill comes due.

4. For the following list of items, indicate if they are in M1, M2, or neither:

a. Your $5,000 line of credit on your Bank of America card
b. $50 dollars' worth of traveler's checks you have not used yet
c. $1 in quarters in your pocket
d. $1200 in your checking account
e. $2000 you have in a money market account

Solution:

a. Neither in M1 or M2
b. That is part of M1, and because M2 includes M1 it is also part of M2
c. Currency out in the public hands is part of M1 and M2
d. Checking deposits are in M1 and M2
e. Money market accounts are in M2

5. Explain why the money listed under assets on a bank balance sheet may not actually be in the bank?

Solution: A bank's assets include cash held in their vaults, but assets also include monies that the bank holds at the Federal Reserve Bank (called "reserves"), loans that are made to customers, and bonds.

6. Imagine that you are in the position of buying loans in the secondary market (that is, buying the right to collect the payments on loans made by banks) for a bank or other financial services company. Explain why you would be willing to pay more or less for a given loan if:

a. The borrower has been late on a number of loan payments
b. Interest rates in the economy as a whole have risen since the loan was made
c. The borrower is a firm that has just declared a high level of profits
d. Interest rates in the economy as a whole have fallen since the loan was made

Solution

a. A borrower who has been late on a number of loan payments looks perhaps less likely to repay the loan, or to repay it on time, and so you would want to pay less for that loan.
b. If interest rates generally have risen, then this loan made at a time of relatively lower interest rates looks less attractive, and you would pay less for it.
c. If the borrower is a firm with a record of high profits, then it is likely to be able to repay the loan, and you would be willing to pay more for the loan.
d. If interest rates in the economy have fallen, then the loan is worth more.

Review Questions

7. What are the four functions served by money?

Solution: A unit of account, a medium of exchange, a store of value and a standard of deferred payment.

8. How does the existence of money simplify the process of buying and selling?

Solution: Money facilitates exchange by eliminating the need to find barter arrangements to which both parties are agreeable, what economists call a "coincidence of wants."

9. What is the double-coincidence of wants?

Solution: This is when two parties discover that each has something the other wants, and a rate of exchange can be agreed upon.

10. What components of money are counted as part of M1?

Solution: M1 measures currency, travelers' checks and checking accounts.

11. What components of money are counted in M2?

Solution: M2 measures savings and money market accounts in addition to M1.

12. Why is a bank called a financial intermediary?

Solution: Banks help lenders find borrowers and vice versa, serving as a middleman to help facilitate financial transactions.

13. What does a balance sheet show?

Solution: A balance sheet shows all of a bank's assets and liabilities.

14. What are the assets of a bank? What are its liabilities?

Solution: The assets of a bank are the loans it has issued and its reserves, the liabilities are the accounts it holds, since it ultimately owes that money back to lenders.

15. How do you calculate the net worth of a bank?

Solution: The net worth of a bank is the bank's assets minus liabilities.

16. How can a bank end up with negative net worth?

Solution: If borrowers default on loans, the bank can end up with more liabilities than assets.

17. What is the asset-liability time mismatch that all banks face?

Solution: The fact that liabilities must be paid off on demand, while assets take time to accrue.

18. What is the risk if a bank does not diversify its loans?

Solution: A bank should diversify its loans so that if one particular market goes bad, it does not lose all of its loans in one blow.

19. How do banks create money?

Solution: Banks create money by loaning out deposits to borrowers, creating a multiplier effect on the money supply.

20. What is the formula for the money multiplier?

Solution: The money multiplier is the reciprocal of the reserve requirements on banks.

Critical Thinking Questions

21. The Bring it Home Feature discusses the use of cowrie shells as money. Although cowrie shells are no longer used as money, do you think other forms of commodity monies are possible? What role might technology play in our definition of money?

Solution: Commodity money can take any number of forms, with gold and silver being the most popular, but this does not exclude other kinds as well. Technology has made digital currency possible, a new idea with interesting potential.

22. Imagine that you are a barber in a world without money. Explain why it would be tricky to obtain groceries, clothing, and a place to live in this situation.

Solution: Suppose the grocer is bald! In order to obtain the goods he needs, the barber would have to find people who want haircuts but also produce the items he most desires.

23. Explain why you think the Federal Reserve Bank tracks M1 and M2.

Solution: The Federal Reserve is responsible for conducting the nation's monetary policy. To do that, it needs to keep track of how much money is in circulation. The two primary measures of the supply of money are M1 and M2. The money supply is correlated with total expenditure in the economy, which affects the level of economic activity and the rate of inflation. Since the purpose of monetary policy is to influence economic activity and inflation, the Federal Reserve tracks M1 and M2.

24. The total amount of U.S. currency in circulation divided by the U.S. population comes out to about $3,500 per person. That is more than most of us carry. Where is all the cash?

Solution: Most of it is in banks or saved in households.

25. Explain the difference between how you would characterize bank deposits and loans as assets and liabilities on your own personal balance sheet and how a bank would characterize deposits and loans as assets and liabilities on its balance sheet.

Solution: An individual would view a bank deposit as an asset, since he can draw upon it at any time, and a loan as a liability, since he has to repay it. A bank takes the opposite view, since it has to pay deposits back, but can collect on loans.

26. Should banks have to hold 100% of their deposits? Why or why not?

Solution: No. Without the ability to lend money, banks would not be able to earn profits, or increase economic growth through the multiplier system.

27. Explain what will happen to the money multiplier process if there is an increase in the reserve requirement?

Solution: Since a smaller portion of each deposit is being lent out, the multiplier will decrease. This means fewer loans lent and less economic growth.

28. What do you think the Federal Reserve Bank did to the reserve requirement during the Great Recession of 2008–2009?

Solution: The Federal Reserve could have decreased reserve requirements to attempt to stimulate demand, but in fact they elected to use other monetary policy tools instead, since excess lending by banks was one of the causes of the recession to begin with.

Problems

29. If you take $100 out of your piggy bank and deposit it in your checking account, how did M1 change? Did M2 change?

Solution: Neither of these measures changes if there are no loans. However, with loans, M1 and M2 can increase through multiple loans created by the $100 deposit. The increase in M1 and M2 would be equal to ($100-($100*reserve requirement))* money multiplier. In other words if the reserve requirement were 20%, then the money multiplier would be 1/0.2= 5. Thus the increase in the money supply would be ($100- ($100*20%))*5 =$400 so M1 and M2 could grow by a total of $400 as a result of putting $100 into the banking system.

30. A bank has deposits of $400. It holds reserves of $50. It has purchased government bonds worth $70. It has made loans of $300. Set up a T-account balance sheet for the bank, with assets and liabilities, and calculate the bank's net worth.

Solution:

Assets	Liabilities
Reserves = $50	Deposits = $400
Bonds = $70	
Loans = $300	
Total = $420	Total = $400

Since the bank's assets total $420 and the bank's liabilities total $400, the bank's net worth is $20.

31. Humongous Bank is the only bank in the economy. The people in this economy have $20 million in money, and they deposit all their money in Humongous Bank.

- **a. Humongous Bank decides on a policy of holding 100% reserves. Draw a T-account for the bank.**
- **b. Humongous Bank is required to hold 5% of its existing $20 million as reserves, and to loan out the rest. Draw a T-account for the bank after this first round of loans has been made.**
- **c. Assume that Humongous bank is part of a multibank system. How much will money supply increase with that original loan of $19 million?**

Solution:

a. Assets: $20 million in reserves. Liabilities: $20 million in deposits.

Assets	Liabilities
Reserves = $20 million	Deposits = $20 million
Total = $20 million	Total = $20 million

b. Assets: $1 million in reserves. $19 million in loans. Liabilities: $20 million in deposits.

Assets	Liabilities
Reserves = $1 million	Deposits = $20 million
Loans = $19 million	
Total = $20 million	Total = $20 million

The money multiplier is the inverse of the reserve requirement, which in this case is 20, so the $19 million in deposits will increase the money supply by $380 million.

CHAPTER 15: MONETARY POLICY AND BANK REGULATION

1. Why is it important for the members of the Board of Governors of the Federal Reserve to have longer terms in office than elected officials, like the President?

Solution: Longer terms insulate the Board from political forces. Since the presidency can potentially change every four years, the Federal Reserve's independence prevents drastic swings in monetary policy with every new administration and allows policy decisions to be made only on economic grounds.

2. Given the danger of bank runs, why do banks not keep the majority of deposits on hand to meet the demands of depositors?

Solution: Banks make their money from issuing loans and charging interest. The more money that is stored in the bank's vault, the less is available for lending and the less money the bank stands to make.

3. Bank runs are often described as "self-fulfilling prophecies." Why is this phrase appropriate to bank runs?

Solution: The fear and uncertainty created by the suggestion that a bank might fail can lead depositors to withdraw their money. If many depositors do this at the same time, the bank may not be able to meet their demands and will, indeed, fail.

4. If the central bank sells $500 in bonds to a bank that has issued $10,000 in loans and is exactly meeting the reserve requirement of 10%, what will happen to the amount of loans and to the money supply in general?

Solution: The bank has to hold $1,000 in reserves, so when it buys the $500 in bonds, it will have to reduce its loans by $500 to make up the difference. The money supply decreases by the same amount.

5. What would be the effect of increasing the reserve requirements of banks on the money supply?

Solution: An increase in reserve requirements would reduce the supply of money, since more money would be held in banks rather than circulating in the economy.

6. Why does contractionary monetary policy cause interest rates to rise?

Solution: Contractionary policy reduces the amount of loanable funds in the economy. As with all goods, greater scarcity leads a greater price, so the interest rate, or the price of borrowing money, rises.

7. Why does expansionary monetary policy causes interest rates to drop?

Solution: An increase in the amount of available loanable funds means that there are more people who want to lend. They, therefore, bid the price of borrowing (the interest rate) down.

8. Why might banks want to hold excess reserves in time of recession?

Solution: In times of economic uncertainty, banks may worry that borrowers will lose the ability to repay their loans. They may also fear that a panic is more likely and they will need the excess reserves to meet their obligations.

9. Why might the velocity of money change unexpectedly?

Solution: If consumer optimism changes, spending can speed up or slow down. This could also happen in a case where consumers need to buy a large number of items quickly, such as in a situation of national emergency.

Review Questions

10. How is a central bank different from a typical commercial bank?

Solution: A central bank doesn't make loans or take deposits from individuals, but instead regulates the money supply of the entire economy.

11. List the three traditional tools that a central bank has for controlling the money supply.

Solution: Buying and selling bonds on the open market, changing the discount rate and altering reserve requirements.

12. How is bank regulation linked to the conduct of monetary policy?

Solution: Bank regulation affects the money supply through mechanisms such as the reserve requirement ratio, which determines how much money banks must keep on hand rather than lend out.

13. What is a bank run?

Solution: A bank run occurs when large numbers of people want to withdraw their deposits, such that the bank lacks the reserves to fulfill its obligations.

14. In a program of deposit insurance as it is operated in the United States, what is being insured and who pays the insurance premiums?

Solution: The deposits held by banks are being insured, and the insurance premiums are paid by the banks themselves.

15. In government programs of bank supervision, what is being supervised?

Solution: The operations of banks such that they do not engage in overly risky behavior that could result in bank runs and bank failures.

16. What is the lender of last resort?

Solution: The central bank is the lender of last resort, ensuring that funds are available even if other banks are unwilling to offer loans.

17. Name and briefly describe the responsibilities of each of the following agencies: FDIC, NCUA, and OCC.

Solution: The Federal Deposit Insurance Corporation insures deposits held in banks against losses, The National Credit Union Administration supervises and regulates credit unions. The Office of the Comptroller of the Currency supervises national banks and branches of foreign banks in the U.S.

18. Explain how to use an open market operation to expand the money supply.

Solution: Buying bonds on the open market causes an increase in the money supply.

19. Explain how to use the reserve requirement to expand the money supply.

Solution: Lowering reserve requirements expands the money supply as banks are able to issue more loans.

20. Explain how to use the discount rate to expand the money supply.

Solution: Lowering the discount rate reduces the price of borrowing, so banks borrow more reserves and the money supply increases as the reserves are lent out.

21. How do the expansionary and contractionary monetary policies affect the quantity of money?

Solution: Expansionary monetary policy causes the money supply to increase by the central bank offering currency in exchange for bonds, and by reducing the cost of borrowing and lending for banks. Contractionary monetary policy reduces the money supply by selling bonds in exchange for currency, and increasing the price of borrowing and lending by banks.

22. How does tight and loose monetary policy affect interest rates?

Solution: Loose monetary policy lowers interest rates, while tight monetary policy raises them.

23. How does expansionary, tight, contractionary, and loose monetary policy affect aggregate demand?

Solution: Expansionary and loose monetary policy boosts aggregate demand, while contractionary and tight monetary policy reduces it.

24. Which kind of monetary policy would you expect in response to high inflation: expansionary or contractionary? Why?

Solution: Contractionary monetary policy would be the appropriate response. Reducing the money supply would raise interest rates and prevent prices from rising so quickly.

25. Explain how to use quantitative easing to stimulate aggregate demand.

Solution: Quantitative easing refers to a wide variety of expansionary monetary actions taken by the central bank, all of which inject money into the economy and reduce the cost of borrowing and lending, in the hopes of stimulating aggregate demand.

26. Which kind of monetary policy would you expect in response to recession: expansionary or contractionary? Why?

Solution: Expansionary, sin order to stimulate demand and boost employment to hasten a recovery from the recession.

27. How might each of the following factors complicate the implementation of monetary policy: long and variable lags, excess reserves, and movements in velocity?

Solution: Lags complicate monetary policy because it takes time for the effects of a new policy to be felt. If economic conditions change before the effects of monetary policy happen, the actual outcome could be undesirable. Excess reserves can be a problem if the central bank is trying to increase the money supply, but banks are holding more than their required reserves due to fear of worsening economic conditions. The central bank makes its calculations with a certain velocity of money in mind. If this changes, it can throw off the intended effect of a monetary policy.

28. Define the velocity of the money supply.

Solution: The velocity of the money supply is the rate at which money changes hands in the economy.

29. What is the basic quantity equation of money?

Solution: The money supply times the velocity of money equals the price level times total output. $M \times V = P \times Y$.

30. How does a monetary policy of inflation targeting work?

Solution: The central bank decides on a desirable inflation rate and expands or contracts the money supply until that rate is observed.

Critical Thinking Questions

31. Why do presidents typically reappoint Chairs of the Federal Reserve Board even when they were originally appointed by a president of a different political party?

Solution: Since the central bank is independent from the federal government, there is less of an advantage to having an appointee of a particular party, whereas maintaining the same leadership ensures a consistent policy.

32. In what ways might monetary policy be superior to fiscal policy? In what ways might it be inferior?

Solution: Monetary policy is more agile than fiscal policy because it does not have to be approved by Congress. On the other hand, monetary policy tends to be more inflationary than fiscal policy.

33. The term "moral hazard" describes increases in risky behavior resulting from efforts to make that behavior safer. How does the concept of moral hazard apply to deposit insurance and other bank regulations?

Solution: Since banks know that their deposits are insured, moral hazard would indicate that banks would be more likely to engage in risky lending behavior than if there were no such protections.

34. Explain what would happen if banks were notified they had to increase their required reserves by one percentage point from, for example, 9% to10% of deposits. What would their options be to come up with the cash?

Solution: Banks could either sell off some assets, such as government bonds, or begin issuing fewer loans and foreclosing on delinquent loans.

35. A well-known economic model called the Phillips Curve (discussed in The Keynesian Perspective chapter) describes the short run tradeoff typically observed between inflation and unemployment. Based on the discussion of expansionary and contractionary monetary policy, explain why one of these variables usually falls when the other rises.

Solution: When the central bank uses expansionary policy to stimulate demand, the influx of money will cause prices to rise and lead to higher rates of inflation, while the increase in demand will create jobs and reduce unemployment.

36. How does rule-based monetary policy differ from discretionary monetary policy (that is, monetary policy not based on a rule? What are some of the arguments for each?

Solution: Rule based monetary policy limits changes in the money supply based on some predefined rule, such as increasing the money supply 1% per year, or increasing it at the same rate as GDP growth, whereas discretionary monetary policy allows for more flexibility in response to unforeseen events. Advocates for rule based monetary policy argue that the decision made by central bankers can be overreactions based on fear or public opinion, and that a steady, predictable policy is preferable. Advocates for discretionary policy claim that rules cannot account for unforeseen changes in the economy, and the central bankers need to be able to respond using their own judgment.

37. Is it preferable for central banks to primarily target inflation or unemployment? Why?

Solution: Inflation is generally agreed to be the better target, although many central banks target both. Too narrow of a focus on unemployment can result in wildly fluctuating price levels that can be very damaging to the economy.

Problems

38. Suppose the Fed conducts an open market purchase by buying $10 million in Treasury bonds from Acme Bank. Sketch out the balance sheet changes that will occur as Acme converts the bond sale proceeds to new loans. The initial Acme bank balance sheet contains the following information: Assets – reserves 30, bonds 50, and loans 50; Liabilities – deposits 100 and equity 30.

Solution: The new balance sheet will read:

Assets	Liabilities
Reserves = $30	Deposits = $100
Bonds = $50-10 = $40	Equity = $30
Loans = $50+10 = $60	
Total = $130	Total = $130

39. Suppose the Fed conducts an open market sale by selling $10 million in Treasury bonds to Acme Bank. Sketch out the balance sheet changes that will occur as Acme restores its required reserves (10% of deposits) by reducing its loans. The initial balance sheet for Acme Bank contains the following information: Assets – reserves 30, bonds 50, and loans 250; Liabilities – deposits 300 and equity 30.

Solution: The new balance sheet will read:

Assets	Liabilities
Reserves = $30	Deposits = $250
Bonds = $60	
Loans = $40	
Total = $130	Total = $330

40. All other things being equal, by how much will nominal GDP expand if the central bank increases the money supply by $100 billion, and the velocity of money is 3?

Solution: Nominal GDP will increase by $300 billion ($100 billion x 3 = P x Y)

41. Suppose now that economists expect the velocity of money to increase by 50% as a result of the monetary stimulus. What will be the total increase in nominal GDP?

Solution: The result will be $100 billion x (3 x 1.5) = $450 billion.

42. If GDP is 1500 and the money supply is 400, what is velocity?

Solution: 400 x V = 1500; V = 3.75

43. If GDP now rises to 1600, but the money supply does not change, how has velocity changed?

Solution: Velocity will have increased. 400 x V = 1600; V = 4

44. If GDP now falls back to 1500 and the money supply falls to 350, what is velocity?
Solution: 350 x V = 1500; V = 4.29

CHAPTER 16: EXCHANGE RATES AND INTERNATIONAL CAPITAL FLOWS

Self-Check Questions

1. **How will a stronger euro affect the following economic agents?**
   a. **A British exporter to Germany.**
   b. **A Dutch tourist visiting Chile.**
   c. **A Greek bank investing in a Canadian government bond.**
   d. **A French exporter to Germany.**

Solution

a. The British use the pound sterling, while Germans use the euro, so a British exporter will receive euros from export sales, which will need to be exchanged for pounds. A stronger euro will mean more pounds per euro, so the exporter will be better off. In addition, the lower price for German imports will stimulate demand for British exports. For both these reasons, a stronger euro benefits the British exporter.
b. The Dutch use euros while the Chileans use pesos, so the Dutch tourist needs to turn euros into Chilean pesos. An increase in the euro means that the tourist will get more pesos per euro. As a consequence, the Dutch tourist will have a less expensive vacation than he planned, so the tourist will be better off.
c. The Greek use euros while the Canadians use dollars. An increase in the euro means it will buy more Canadian dollars. As a result, the Greek bank will see a decrease in the cost of the Canadian bonds, so it may purchase more bonds. Either way, the Greek bank benefits.
d. Since both the French and Germans use the euro, an increase in the euro, in terms of other currencies, should have no impact on the French exporter.

2. **Suppose that political unrest in Egypt leads financial markets to anticipate depreciation in the Egyptian pound. How will that affect the demand for pounds, supply of pounds, and exchange rate for pounds compared to, say, U.S. dollars?**

Solution: Expected depreciation in a currency will lead people to divest themselves of the currency. We should expect to see an increase in the supply of pounds and a decrease in demand for pounds. The result should be a decrease in the value of the pound vis à vis the dollar.

3. **Suppose U.S. interest rates decline compared to the rest of the world. What would be the likely impact on the demand for dollars, supply of dollars, and exchange rate for dollars compared to, say, euros?**

Solution: Lower U.S. interest rates make U.S. assets less desirable compared to assets in the European Union. We should expect to see a decrease in demand for dollars and an increase in supply of dollars in foreign currency markets. As a result, we should expect to see the dollar depreciate compared to the euro.

4. **Suppose Argentina gets inflation under control and the Argentine inflation rate decreases substantially. What would likely happen to the demand for Argentine pesos, the supply of Argentine pesos, and the peso/U.S. dollar exchange rate?**

Solution: A decrease in Argentine inflation relative to other countries should cause an increase in demand for pesos, a decrease in supply of pesos, and an appreciation of the peso in foreign currency markets.

5. This chapter has explained that "one of the most economically destructive effects of exchange rate fluctuations can happen through the banking system," if banks borrow from abroad to lend domestically. Why is this less likely to be a problem for the U.S. banking system?

Solution: The problem occurs when banks borrow foreign currency but lend in domestic currency. Since banks' assets (loans they made) are in domestic currency, while their debts (money they borrowed) are in foreign currency, when the domestic currency declines, their debts grow larger. If the domestic currency falls substantially in value, as happened during the Asian financial crisis, then the banking system could fail. This problem is unlikely to occur for U.S. banks because, even when they borrow from abroad, they tend to borrow dollars. Remember, there are trillions of dollars in circulation in the global economy. Since both assets and debts are in dollars, a change in the value of the dollar does not cause banking system failure the way it can when banks borrow in foreign currency.

6. A booming economy can attract financial capital inflows, which promote further growth. But capital can just as easily flow out of the country, leading to economic recession. Is a country whose economy is booming because it decided to stimulate consumer spending more or less likely to experience capital flight than an economy whose boom is caused by economic investment expenditure?

Solution: While capital flight is possible in either case, if a country borrows to invest in real capital it is more likely to be able to generate the income to pay back its debts than a country that borrows to finance consumption. As a result, an investment-stimulated economy is less likely to provoke capital flight and economic recession.

7. How would a contractionary monetary policy affect the exchange rate, net exports, aggregate demand, and aggregate supply?

Solution: A contractionary monetary policy, by driving up domestic interest rates, would cause the currency to appreciate. The higher value of the currency in foreign exchange markets would reduce exports, since from the perspective of foreign buyers, they are now more expensive. The higher value of the currency would similarly stimulate imports, since they would now be cheaper from the perspective of domestic buyers. Lower exports and higher imports cause net exports (EX – IM) to fall, which causes aggregate demand to fall. The result would be a decrease in GDP working through the exchange rate mechanism reinforcing the effect contractionary monetary policy has on domestic investment expenditure. However, cheaper imports would stimulate aggregate supply, bringing GDP back to potential, though at a lower price level.

8. A central bank can allow its currency to fall indefinitely, but it cannot allow its currency to rise indefinitely. Why not?

Solution: For a currency to fall, a central bank need only supply more of its currency in foreign exchange markets. It can print as much domestic currency as it likes. For a currency to rise, a central bank needs to buy its currency in foreign exchange markets, paying with foreign currency. Since no central bank has an infinite amount of foreign currency reserves, it cannot buy its currency indefinitely.

9. Is a country for which imports and exports make up a large fraction of the GDP more likely to adopt a flexible exchange rate or a fixed (hard peg) exchange rate?

Solution: Variations in exchange rates, because they change import and export prices, disturb international trade flows. When trade is a large part of a nation's economic activity, government will find it more advantageous to fix exchange rates to minimize disruptions of trade flows.

Review Questions

10. What is the foreign exchange market?

Solution: The foreign exchange market is where currencies are traded for one another.

11. Describe some buyers and some sellers in the market for U.S. dollars.

Solution: Tourists to the U.S. and foreign investors who want to invest in American companies will need to buy dollars, while tourists traveling abroad and importers of foreign goods will want to sell dollars in exchange for other currencies.

12. What is the difference between foreign direct investment and portfolio investment?

Solution: Foreign direct investment involves purchasing a firm or starting up a new enterprise in a foreign country, while foreign portfolio investment involves purchasing stocks, bonds and other items which require no management.

13. What does it mean to hedge a financial transaction?

Solution: Hedging involves making longer term contracts with fixed exchange rates to protect oneself from unexpected changes in the value of a currency.

14. What does it mean to say that a currency appreciates? Depreciates? Becomes stronger? Becomes weaker?

Solution: When a currency appreciates or becomes stronger, it gains value with respect to other currencies. When a currency depreciates or becomes weaker, it loses value with respect to other currencies.

15. Does an expectation of a stronger exchange rate in the future affect the exchange rate in the present? If so, how?

Solution: Yes. People who expect a stronger exchange rate will buy dollars in anticipation of rising prices, and this increased demand will actually cause the exchange rate to rise.

16. Does a higher rate of return in a nation's economy, all other things being equal, affect the exchange rate of its currency? If so, how?

Solution: Yes. A higher rate of return will attract foreign investment, increase the demand for the currency and cause the exchange rate to rise.

17. Does a higher inflation rate in an economy, other things being equal, affect the exchange rate of its currency? If so, how?

Solution: Yes. A higher inflation rate causes the exchange rate to depreciate, since people buying the currency know that it will be worth less in the future and are not willing to pay as high a price.

18. What is the purchasing power parity exchange rate?

Solution: The purchasing power parity exchange rate is the rate that equalizes the prices of goods across international economies.

19. What are some of the reasons a central bank is likely to care, at least to some extent, about the exchange rate?

Solution: The exchange rate determines to a large extent the amount of imports and exports in a country, which have an effect on the money supply and GDP; additionally, the exchange affects flows of financial capital into or outside of the country, which affect financial markets and interest rates as well as the money supply. For these reasons, the central bank wants to be aware of changes to the exchange rate.

20. How can an unexpected fall in exchange rates injure the financial health of a nation's banks?

Solution: An unexpected fall in exchange rates can make it more difficult for banks to repay foreign creditors, since the dollar will buy a smaller amount of foreign currency.

21. What is the difference between a floating exchange rate, a soft peg, a hard peg, and dollarization?

Solution: A floating exchange rate allows relative prices of currencies to fluctuate freely. A soft exchange rate maintains a certain range of acceptable exchange rates, a hard peg maintains a single, fixed exchange rate and dollarization is the practice of adopting another country's currency completely.

22. List some advantages and disadvantages of the different exchange rate policies.

Solution: Fixed exchange rates keep prices between countries steady and predictable, but limit the central bank's ability to conduct independent monetary policy, while floating exchange rates permit a flexible central bank, but allow prices to fluctuate freely.

Critical Thinking Questions

23. Why would a nation "dollarize"—that is, adopt another country's currency instead of having its own?

Solution: A nation might dollarize to facilitate a large number of transactions with the country issuing the parent currency, or to guard against wild currency fluctuations by standardizing to a stable, well-known currency.

24. Can you think of any major disadvantages to dollarization? How would a central bank work in a country that has dollarized?

Solution: The major disadvantage of dollarizing is that the country loses its ability to conduct independent monetary policy using its own central bank.

25. If a country's currency is expected to appreciate in value, what would you think will be the impact of expected exchange rates on yields (e.g., the interest rate paid on government bonds) in that country? *Hint:* Think about how expected exchange rate changes and interest rates affect demand and supply for a currency.

Solution: A higher expected exchange rate should result in lower bond yields, since the higher demand for bonds will drive the interest rate down.

26. Do you think that a country experiencing hyperinflation is more or less likely to have an exchange rate equal to its purchasing power parity value when compared to a country with a low inflation rate?

Solution: The country experiencing hyperinflation is less likely to have an exchange rate reflecting PPP, because the rapid devaluation of the currency will strongly discourage purchases of that currency regardless of what real price differences are.

27. Suppose a country has an overall balance of trade so that exports of goods and services equal imports of goods and services. Does that imply that the country has balanced trade with each of its trading partners?

Solution: No. Exchange rates will be different between different trading partners and the balance of trade will differ as well.

28. We learned that monetary policy is amplified by changes in exchange rates and the corresponding changes in the balance of trade. From the perspective of a nation's central bank, is this a good thing or a bad thing?

Solution: This can be good from the perspective of a central bank, since it allows monetary policy to be more potent than it otherwise would be.

29. If a developing country needs foreign capital inflows, management expertise, and technology, how can it encourage foreign investors while at the same time protect itself against capital flight and banking system collapse, as happened during the Asian financial crisis?

Solution: Adopting a lower exchange rate will encourage foreign investment, since the currency of the developing country will be cheaper relative to other investments. Capital will be unlikely to flee due to the increased relative cost of investing elsewhere. Alternatively, the country could restrict flows of financial capital while providing favorable treatment (for example, through lower income tax rates) for direct investment.

30. Many developing countries, like Mexico, have moderate to high rates of inflation. At the same time, international trade plays an important role in their economies. What type of exchange rate regime would be best for such a country's currency vis à vis the U.S. dollar?

Solution: Mexico would probably benefit from a soft peg exchange rate, to make sure international prices do not fluctuate too much, but still allow some room for inflation.

31. What would make a country decide to change from a common currency, like the euro, back to its own currency?

Solution: A country may want to be able to regulate the money supply in its domestic economy and conduct independent monetary policy to combat inflation or unemployment.

Problems

32. A British pound cost $1.56 in U.S. dollars in 1996, but $1.66 in U.S. dollars in 1998. Was the pound weaker or stronger against the dollar? Did the dollar appreciate or depreciate versus the pound?

Solution: The pound was stronger than the dollar and appreciated from 1996 to 1998.

33. Using the information from the previous Exercise 16.32, calculate the cost of a U.S. dollar in terms of British pounds in 1996 and 1998.

Solution:

£1 / $1.56 = 0.64 pounds per dollar in 1996.
£1 / $1.66 = 0.60 pounds per dollar in 1998.

CHAPTER 17: GOVERNMENT BUDGETS AND FISCAL POLICY

Self-Check Questions

1. When governments run budget deficits, how do they make up the differences between tax revenue and spending?

Solution: The government borrows funds by selling Treasury bonds, notes, and bills.

2. When governments run budget surpluses, what is done with the extra funds?

Solution: The funds can be used to pay down the national debt or else be refunded to the taxpayers.

3. Is it possible for a nation to run budget deficits and still have its debt/GDP ratio fall? Explain your answer. Is it possible for a nation to run budget surpluses and still have its debt/GDP ratio rise? Explain your answer.

Solution: Yes, a nation can run budget deficits and see its debt/GDP ratio fall. In fact, this is not uncommon. If the deficit is small in a given year, than the addition to debt in the numerator of the debt/GDP ratio will be relatively small, while the growth in GDP is larger, and so the debt/GDP ratio declines. This was the experience of the U.S. economy for the period from the end of World War II to about 1980. It is also theoretically possible, although not likely, for a nation to have a budget surplus and see its debt/GDP ratio rise. Imagine the case of a nation with a small surplus, but in a recession year when the economy shrinks. It is possible that the decline in the nation's debt, in the numerator of the debt/GDP ratio, would be proportionally less than the fall in the size of GDP, so the debt/GDP ratio would rise.

4. Suppose that gifts were taxed at a rate of 10% for amounts up to $100,000 and 20% for anything over that amount. Would this tax be regressive or progressive?

Solution: Progressive. People who give larger gifts subject to the higher tax rate would typically have larger incomes as well.

5. If an individual owns a corporation for which he is the only employee, which different types of federal tax will he have to pay?

Solution: Corporate income tax on his profits, individual income tax on his salary, and payroll tax taken out of the wages he pays himself.

6. What taxes would an individual pay if he were self-employed and the business is not incorporated?

Solution: Individual income taxes

7. The social security tax is 6.2% on employees' income earned below $113,000. Is this tax progressive, regressive or proportional?

Solution: The tax is regressive because wealthy income earners are not taxed at all on income above $113,000. As a percent of total income, the social security tax hits lower income earners harder than wealthier individuals.

8. Debt has a certain self-reinforcing quality to it. There is one category of government spending that automatically increases along with the federal debt. What is it?

Solution: As debt increases, interest payments also rise, so that the deficit grows even if we keep other government spending constant.

9. True or False:

- **a. Federal spending has grown substantially in recent decades.**
- **b. By world standards, the U.S. government controls a relatively large share of the U.S. economy.**
- **c. A majority of the federal government's revenue is collected through personal income taxes.**
- **d. Education spending is slightly larger at the federal level than at the state and local level.**
- **e. State and local government spending has not risen much in recent decades.**
- **f. Defense spending is higher now than ever.**
- **g. The share of the economy going to federal taxes has increased substantially over time.**
- **h. Foreign aid is a large portion, although less than half, of federal spending.**
- **i. Federal deficits have been very large for the last two decades.**
- **j. The accumulated federal debt as a share of GDP is near an all-time high.**

Solution:

- a. As a share of GDP, this is false. In nominal dollars, it is true.
- b. False.
- c. False.
- d. False. Education spending is much higher at the state level.
- e. False. As a share of GDP, it is up about 50.
- f. As a share of GDP, this is false, and in real dollars, it is also false.
- g. False.
- h. False; it's about 1%.
- i. False. Although budget deficits were large in 2003 and 2004, and continued into the later 2000s, the federal government ran budget surpluses from 1998–2001.
- j. False.

10. What is the main reason for employing contractionary fiscal policy in a time of strong economic growth?

Solution: To keep prices from rising too much or too rapidly.

11. What is the main reason for employing expansionary fiscal policy during a recession?

Solution: To increase employment.

12. In a recession, does the actual budget surplus or deficit fall above or below the standardized employment budget?

Solution: It falls below because less tax revenue than expected is collected.

13. What is the main advantage of automatic stabilizers over discretionary fiscal policy?

Solution: Automatic stabilizers take effect very quickly, whereas discretionary policy can take a long time to implement.

14. Explain how automatic stabilizers work, both on the taxation side and on the spending side, first in a situation where the economy is producing less than potential GDP and then in a situation where the economy is producing more than potential GDP.

Solution: In a recession, because of the decline in economic output, less income is earned, and so less in taxes is automatically collected. Many welfare and unemployment programs are designed so that those who fall into certain categories, like "unemployed" or "low income," are eligible for benefits. During a recession, more people fall into these categories and become eligible for benefits automatically. The combination of reduced taxes and higher spending is just what is needed for an economy in recession producing below potential GDP. With an economic boom, average income levels rise in the economy, so more in taxes is automatically collected. Fewer people meet the criteria for receiving government assistance to the unemployed or the needy, so government spending on unemployment assistance and welfare falls automatically. This combination of higher taxes and lower spending is just what is needed if an economy is producing above its potential GDP.

15. What would happen if expansionary fiscal policy was implemented in a recession but, due to lag, did not actually take effect until after the economy was back to potential GDP?

Solution: Prices would be pushed up as a result of too much spending.

16. What would happen if contractionary fiscal policy were implemented during an economic boom but, due to lag, it did not take effect until the economy slipped into recession?

Solution: Employment would suffer as a result of too little spending.

17. Do you think the typical time lag for fiscal policy is likely to be longer or shorter than the time lag for monetary policy? Explain your answer?

Solution: Monetary policy probably has shorter time lags than fiscal policy. Imagine that the data becomes fairly clear that an economy is in or near a recession. Expansionary monetary policy can be carried out through open market operations, which can be done fairly quickly, since the Federal Reserve's Open Market Committee meets six times a year. Also, monetary policy takes effect through interest rates, which can change fairly quickly. However, fiscal policy is carried out through acts of Congress that need to be signed into law by the president. Negotiating such laws often takes months, and even after the laws are negotiated, it takes more months for spending programs or tax cuts to have an effect on the macroeconomy.

18. How would a balanced budget amendment affect a decision by Congress to grant a tax cut during a recession?

Solution: The government would have to make up the revenue either by raising taxes in a different area or cutting spending.

19. How would a balanced budget amendment change the effect of automatic stabilizer programs?

Solution: Programs where the amount of spending is not fixed, but rather determined by macroeconomic conditions, such as food stamps, would lose a great deal of flexibility if spending increases had to be met by corresponding tax increases or spending cuts.

Review Questions

20. Give some examples of changes in federal spending and taxes by the government that would be discretionary fiscal policy and some that would not.

Solution: A new infrastructure project or an increase in the income tax rate would be examples of fiscal policy, but increased spending due to changes in the interest rate on federal bonds or increased tax revenues due to rising national income would not be examples of fiscal policy.

21. Have the spending and taxes of the U.S. federal government generally had an upward or a downward trend in the last few decades?

Solution: They have remained mostly flat, while increasing in the last couple of years.

22. What are the main categories of U.S. federal government spending?

Solution: The main categories are national defense, Social Security and Medicare payments, and interest on the debt.

23. What is the difference between a budget deficit, a balanced budget, and a budget surplus?

Solution: A budget surplus occurs when a government takes in more tax revenue than it spends, a budget deficit is when it spends more than it takes in and a balanced budget is when the two amounts are equal.

24. Have spending and taxes by state and local governments in the United States had a generally upward or downward trend in the last few decades?

Solution: They have had a generally upward trend.

25. What are the main categories of U.S. federal government taxes?

Solution: Individual income tax, payroll tax, corporate income tax and capital gains tax.

26. What is the difference between a progressive tax, a proportional tax, and a regressive tax?

Solution: A progressive tax has an increasing rate for higher income individuals, a regressive tax has a decreasing rate and a proportional tax charges the same rate regardless of income.

27. What has been the general pattern of U.S. budget deficits in recent decades?

Solution: Budget deficits have generally expanded in recent decades.

28. What is the difference between a budget deficit and the national debt?

Solution: The budget deficit is the difference between tax revenue and spending in a given year. The nation debt is the accumulation of all past deficits.

29. What is the difference between expansionary fiscal policy and contractionary fiscal policy?

Solution: Expansionary fiscal policy increases spending to boost aggregate demand, while contractionary fiscal policy reduces spending to keep prices down.

30. Under what general macroeconomic circumstances might a government use expansionary fiscal policy? When might it use contractionary fiscal policy?

Solution: Governments tend to use expansionary fiscal policy during recessions and contractionary fiscal policy during economic booms.

31. What's the difference between discretionary fiscal policy and automatic stabilizers?

Solution: Discretionary fiscal policy must be enacted through Congress, while automatic stabilizers take place without any legislative action being necessary.

32. Why do automatic stabilizers function "automatically?"

Solution: Automatic stabilizers are structured in such a way that spending increases when the economy suffers, such as when more people apply for unemployment benefits.

33. What is the standardized employment budget?

Solution: The standardized employment budget describes what the unemployment rate would be if the economy were producing at potential GDP.

34. What are some practical weaknesses of discretionary fiscal policy?

Solution: Discretionary fiscal policy allows lobbyists to convince Congress to spend on their behalf, at the expense of others, and encourages Congressmen to engage in pork-barrel projects for their own districts to curry favor with voters.

35. What are some of the arguments for and against a requirement that the federal government budget be balanced every year?

Solution: Arguments for a balanced budget are that the national debt is damaging over the long term due to the rising costs of interest payments, and forcing a balance every year disciplines Congress not to spend too much. Arguments against a balanced budget are that the Congress needs to have flexibility in spending to respond to recessions with fiscal policy.

Critical Thinking Questions

36. Why is government spending typically measured as a percentage of GDP rather than in nominal dollars?

Solution: It is more meaningful to look at spending in terms of the entire output of the economy, because nominal dollars offer no information about the context of the spending.

37. Why are expenditures such as crime prevention and education typically done at the state and local level rather than at the federal level?

Solution: States and cities are in a better position to judge their needs in these areas, and it is also deemed fairer to only tax residents of the affected area in order to pay for these programs.

38. Why is spending by the U.S. government on scientific research at NASA fiscal policy while spending by the University of Illinois is not fiscal policy? Why is a cut in the payroll tax fiscal policy whereas a cut in a state income tax is not fiscal policy?

Solution: Fiscal policy is conducted at the national level in order to affect the entire country. State and local expenditures have localized effects and are not considered fiscal policy.

39. Excise taxes on tobacco and alcohol and state sales taxes are often criticized for being regressive. Although everyone pays the same rate regardless of income, why might this be so?

Solution: These products tend to be more heavily purchased by low-income individuals, so the tax they pay constitutes a higher share of their income than it would for a high-income buyer.

40. What is the benefit of having state and local taxes on income instead of collecting all such taxes at the federal level?

Solution: State and local governments can use that revenue to benefit the local community more effectively, whereas the federal government is more likely to spend the money elsewhere.

41. In a booming economy, is the federal government more likely to run surpluses or deficits? What are the various factors at play?

Solution: It is more likely to run surpluses, because the greater amount of income will produce more tax revenue, and government spending should be relatively low to hold down the rate of inflation.

42. Economist Arthur Laffer famously pointed out that, in some cases, income tax revenue can actually go up when tax rates go down. Why might this be the case?

Solution: Lower tax rates can stimulate demand and create more jobs and income for the nation as a whole. The greater amount of income, taxed at a lower rate, can sometimes produce higher tax revenues than a smaller amount of income taxed at a higher rate.

43. Is it possible for a nation to run budget deficits and still have its debt/GDP ratio fall? Explain your answer. Is it possible for a nation to run budget surpluses and still have its debt/GDP ratio rise? Explain your answer.

Solution: Yes to both of these. A budget deficit is an increase in a nation's debt. If GDP is expanding faster than the growth of debt, the debt to GDP ratio will fall. Conversely, if a nation's GDP is rising more slowly than its debt, the debt to GD ratio will rise.

44. How will cuts in state budget spending affect federal expansionary policy?

Solution: Cuts in state budget spending will partially offset increases in federal spending as part of an expansionary fiscal policy.

45. Is expansionary fiscal policy more attractive to politicians who believe in larger government or to politicians who believe in smaller government? Explain your answer.

Solution: Expansionary fiscal policy is more attractive to politicians who believe in larger government, since it involves increasing government spending.

46. Is Medicaid (federal government aid to low-income families and individuals) an automatic stabilizer?

Solution: Yes. In a recession, as more families become classified as low-income, Medicaid spending will increase, causing aggregate demand to rise.

47. What is a potential problem with a temporary tax decrease designed to increase aggregate demand if people know that it is temporary?

Solution: If people know that the tax decrease is temporary, they will not be as likely to spend their money, but instead will save it, and the expected rise in aggregate demand will not occur.

48. If the government gives a $300 tax cut to everyone in the country, explain the mechanism by which this will cause interest rates to rise.

Solution: The tax cut stimulates aggregate demand, which causes prices to rise. Higher prices will cause lenders to demand a higher interest rate on loans in order to ensure the same real return on investment.

49. Do you agree or disagree with this statement: "It is in the best interest of our economy for Congress and the President to run a balanced budget each year." Explain your answer.

Solution: A matter of opinion for the student to provide.

50. During the Great Recession of 2008–2009, what actions would have been required of Congress and the President had a balanced budget amendment to the Constitution been ratified? What impact would that have had on the unemployment rate?

Solution: Congress would not have been able to increase government spending to stimulate the economy without either increasing taxes or reducing spending in other areas. Economists have debated the effects of the stimulus package, but there may have been larger amounts of unemployment as a result.

Problems

51. A government starts off with a total debt of $3.5 billion. In year one, the government runs a deficit of $400 million. In year two, the government runs a deficit of $1 billion. In year three, the government runs a surplus of $200 million. What is the total debt of the government at the end of year three?

Solution: The total debt is $3.5 billion + $400 million + $1 billion - $200 million = $4.7 billion.

52. If a government runs a budget deficit of $10 billion dollars each year for ten years, then a surplus of $1 billion for five years, and then a balanced budget for another ten years, what is the government debt?

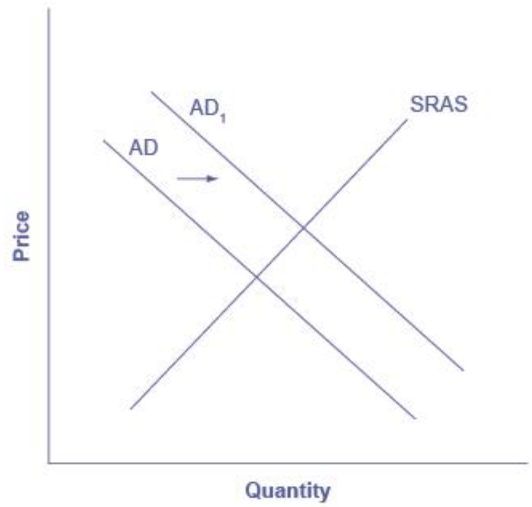
Solution: ($10 billion x 5) - ($1 billion x 10) + (0 x 10) = $40 billion.

53. Specify whether expansionary or contractionary fiscal policy would seem to be most appropriate in response to each of the situations below and sketch a diagram using aggregate demand and aggregate supply curves to illustrate your answer:

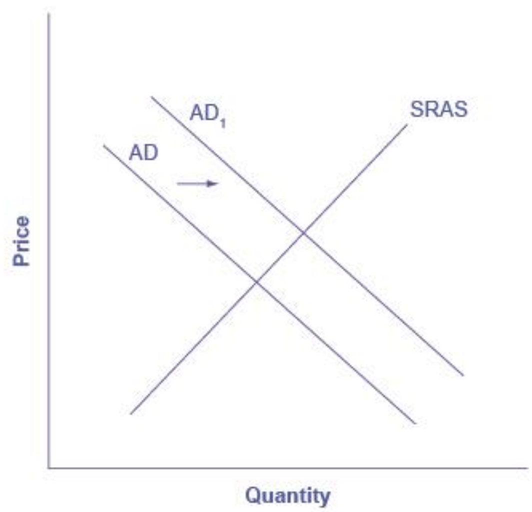
a. **A recession.**
b. **A stock market collapse that hurts consumer and business confidence.**
c. **Extremely rapid growth of exports.**
d. **Rising inflation.**
e. **A rise in the natural rate of unemployment.**
f. **A rise in oil prices.**

Solution:

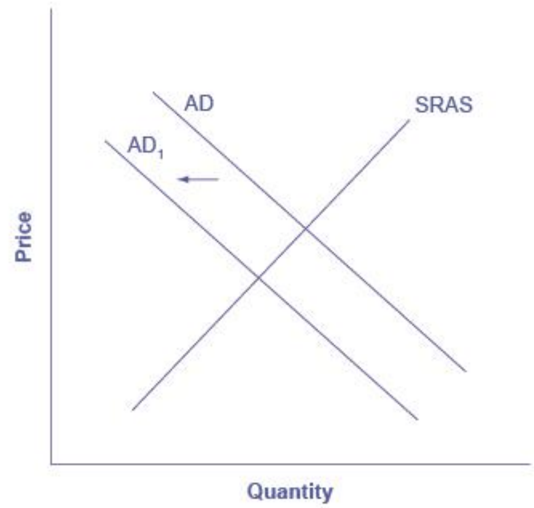
a. Expansionary, to stimulate demand.



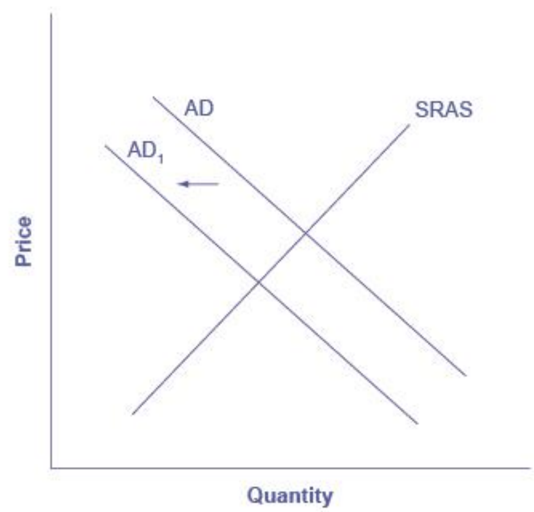
b. Expansionary, to stimulate demand.



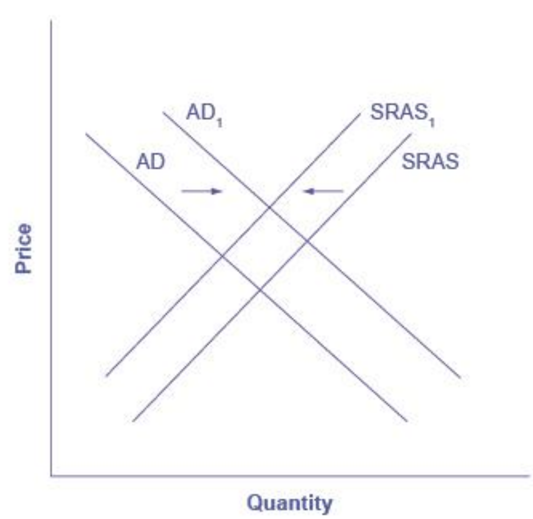
c. Contractionary, to fight inflation.



d. Contractionary, to fight inflation



e. While an expansionary fiscal policy could be used to stimulate AD and employment, this would have no long run effect on the natural rate of unemployment, simply a higher price level.
f. Expansionary, to stimulate demand.



CHAPTER 18: THE IMPACTS OF GOVERNMENT BORROWING

Self-Check Questions

1. **In a country, private savings equals 600, the government budget surplus equals 200, and the trade surplus equals 100. What is the level of private investment in this economy?**

Solution: We use the national savings and investment identity to solve this question. In this case, the government has a budget surplus, so the government surplus appears as part of the supply of financial capital. Then:
Quantity supplied of financial capital = Quantity demanded of financial capital

$$S + (T - G) = I + (X - M)$$
$$600 + 200 = I + 100$$
$$I = 700$$

2. **Assume an economy has a budget surplus of 1,000, private savings of 4,000, and investment of 5,000.**
   a. **Write out a national saving and investment identity for this economy.**
   b. **What will be the balance of trade in this economy?**
   c. **If the budget surplus changes to a budget deficit of 1000, with private saving and investment unchanged, what is the new balance of trade in this economy?**

Solution: Since the government has a budget surplus, the government budget term appears with the supply of capital. The following shows the national savings and investment identity for this economy.
Quantity supplied of financial capital = Quantity demanded of financial capital

$$S + (T - G) = I + (X - M)$$

Plugging the given values into the identity shown in part (a), we find that $(X - M) = 0$.
Since the government has a budget deficit, the government budget term appears with the demand for capital. You do not know in advance whether the economy has a trade deficit or a trade surplus. But when you see that the quantity demanded of financial capital exceeds the quantity supplied, you know that there must be an additional quantity of financial capital supplied by foreign investors, which means a trade deficit of 2000. This example shows that in this case there is a higher budget deficit, and a higher trade deficit.

3. **Why have many education experts recently placed an emphasis on altering the incentives faced by U.S. schools rather than on increasing their budgets? Without endorsing any of these proposals as especially good or bad, list some of the ways in which incentives for schools might be altered.**

Solution: In the last few decades, spending per student has climbed substantially. However, test scores have fallen over this time. This experience has led a number of experts to argue that the problem is not resources—or is not just resources by itself—but is also a problem of how schools are organized and managed and what incentives they have for success. There are a number of proposals to alter the incentives that schools face, but relatively little hard evidence on what proposals work well. Without trying to evaluate whether these proposals are good or bad ideas, you can just list some of them: testing students regularly; rewarding teachers or schools that perform well on such tests; requiring additional teacher training; allowing students to choose between public schools; allowing teachers and parents to start new schools; giving student "vouchers" that they can use to pay tuition at either public or private schools.

4. What are some steps the government can take to encourage research and development?

Solution: The government can direct government spending to R&D. It can also create tax incentives for business to invest in R&D.

5. Imagine an economy in which Ricardian equivalence holds. This economy has a budget deficit of 50, a trade deficit of 20, private savings of 130, and investment of 100. If the budget deficit rises to 70, how are the other terms in the national saving and investment identity affected?

Solution: Ricardian equivalence means that private saving changes to offset exactly any changes in the government budget. Thus, if the deficit increases by 20, private saving increases by 20 as well, and the trade deficit and the budget deficit will not change from their original levels. The original national saving and investment identity is written below. Notice that if any change in the (G – T) term is offset by a change in the S term, then the other terms do not change. So if (G – T) rises by 20, then S must also increase by 20.

Quantity supplied of financial capital = Quantity demanded of financial capital

$$S + (M - X) = I + (G - T)$$

$$130 + 20 = 100 + 50$$

6. In the late 1990s, the U.S. government moved from a budget deficit to a budget surplus and the trade deficit in the U.S. economy grew substantially. Using the national saving and investment identity, what can you say about the direction in which saving and/or investment must have changed in this economy?

Solution: In this case, the national saving and investment identity is written in this way:

Quantity supplied of financial capital = Quantity demanded of financial capital

$$(T - G) + (M - X) + S = I$$

The increase in the government budget surplus and the increase in the trade deficit both increased the supply of financial capital. If investment in physical capital remained unchanged, then private savings must go down, and if savings remained unchanged, then investment must go up. In fact, both effects happened; that is, in the late 1990s, in the U.S. economy, savings declined and investment rose.

Review Questions

7. Based on the national saving and investment identity, what are the three ways the macroeconomy might react to greater government budget deficits?

Solution: Reduced investment, a wider trade deficit and increased savings.

8. How would you expect larger budget deficits to affect private sector investment in physical capital? Why?

Solution: Larger budget deficits increase the demand for capital which drives up interest rates and makes private sector investment more expensive.

9. What are some of the ways fiscal policy might encourage economic growth?

Solution: Fiscal policy can increase government spending on goods and services, which boosts aggregate demand and leads to increased economic output.

10. What are some fiscal policies for improving a society's human capital?

Solution: Spending on education and on scientific research improve human capital in the form of worker productivity.

11. What are some fiscal policies for improving the technologies that the economy will have to draw upon in the future?

Solution: Grants to universities, funding for NASA and other types of scientific research can improve technologies over time.

12. Explain how cuts in funding for programs such as Head Start might affect the development of human capital in the United States.

Solution: The merits of Head Start itself have been disputed, but cuts to education programs in general might have a negative impact on human capital as the workforce is less educated.

13. What is the theory of Ricardian equivalence?

Solution: The theory of Ricardian equivalence holds that private savings change to offset changes in the government budget.

14. What does the concept of rationality have to do with Ricardian equivalence?

Solution: Ricardian equivalence assumes that economic agents are perfectly rational in the sense that they will realize that any increase in deficit-financed government spending will ultimately require higher taxes to repay the debt. In anticipation of the future tax increases, economic agents will cut back on their consumption today, saving for the future tax increase. As a consequence, Ricardian equivalence concludes that deficit-financed government spending will have no effect on total expenditure or GDP.

15. Under what conditions will a larger budget deficit cause a trade deficit?

Solution: A larger budget deficit will cause an increase in the trade deficit when private savings do not offset the spending and private investment is not fully crowded out.

Critical Thinking Questions

16. Assume there is no discretionary increase in government spending. Explain how an improving economy will affect the budget balance and, in turn, investment and the trade balance.

Solution: An improving economy will bring increased tax revenue and reduce the budget deficit, lower interest rates, increase domestic investment and improve the trade balance.

17. Explain how decreased domestic investments that occur due to a budget deficit will affect future economic growth.

Solution: Decreased investment in capital will reduce future economic growth, since large quantities of new, well-maintained capital will be unavailable for growing industries.

18. The U.S. government has shut down a number of times in recent history. Explain how a government shutdown will affect the variables in the national investment and savings identity. Could the shutdown affect the government budget deficit?

Solution: A government shutdown reduces government spending, which reduces the budget deficit, increases investment, reduces savings and reduces the trade deficit.

19. Explain why the government might prefer to provide incentives to private firms to do investment or research and development, rather than simply doing the spending itself?

Solution: Private firms already have the experience and the profit motive to do good work in this field, while government lacks the specialization to do as good of a job.

20. Under what condition would increased government spending not inhibit long-run economic growth? Under what condition would government spending impede long-run economic growth?

Solution: Increased government spending would not inhibit long run growth if it were making up for a shortage of private investment during a recession, because the lack of investment demand would prevent the occurrence of crowding out. If the increased government spending persists past the point of potential output, or occurs when private investment demand is strong, crowding out would impede long run growth.

21. What must take place for the government to run deficits without any crowding out?

Solution: There must be a lack of private investment such that the funds used by the government are not being competed for by private investors.

22. Explain whether or not you agree with the premise of the Ricardian equivalence theory that rational people might reason: "Well, a higher budget deficit (surplus) means that I'm just going to owe more (less) taxes in the future to pay off all that government borrowing, so I'll start saving (spending) now." Why or why not?

Solution: The student should provide his or her own opinion.

23. Explain how a shift from a government budget deficit to a budget surplus might affect the exchange rate.

Solution: As the government relies less on foreign investment, the trade deficit will decrease and the exchange rate will depreciate.

24. Describe how a plan for reducing the government deficit might affect a college student, a young professional, and a middle-income family.

Solution: The middle income family may expect a future tax cut and reduce saving, while a young professional may see the prospect of lower interest rates as a disincentive to save. The college student will not likely be affected very much, as college students tend to have little savings.

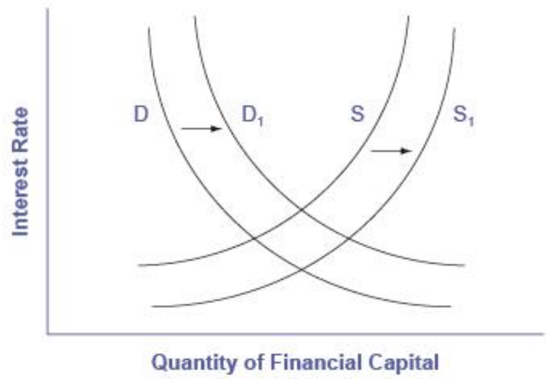
Problems

25. During the most recent recession, some economists argued that the change in the interest rates that comes about due to deficit spending implied in the demand and supply of financial capital graph would not occur. A simple reason was that the government was stepping in to invest when private firms were not. Explain how the deficit demand is offset by the use by government in investment using a graph.

Solution: A reduction in private investment, reflected in a leftward shift of the demand for capital could be compensated for by an increase in government spending, shifting the curve back right.

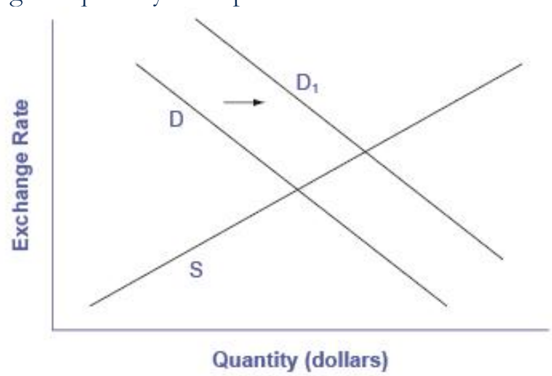
26. Illustrate the concept of Ricardian equivalence using the demand and supply of financial capital graph.

Solution: The graph will show how increased demand for capital from government borrowing is met by an equivalent increase in private savings, or the supply of capital.



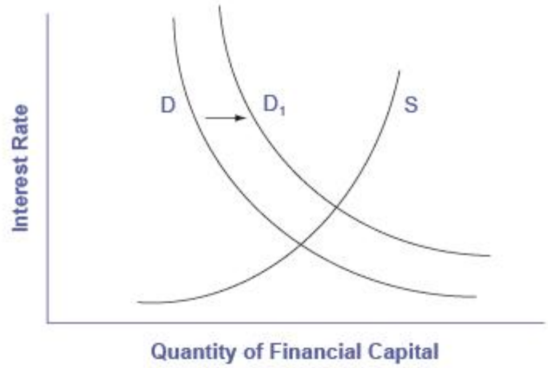
27. Sketch a diagram of how a budget deficit causes a trade deficit. (Hint: Begin with what will happen to the exchange rate when foreigners demand more U.S. government debt.)

Solution: When foreigners buy U.S. debt, their demand drives up the price of the dollar. This makes domestic goods relatively more expensive compared to those of other countries and reduces the quantity of exports while increasing the quantity of imports.



28. Sketch a diagram of how sustained budget deficits cause low economic growth.

Solution: Sustained budget deficits crowd out private investment by raising interest rates, so there is less capital to expand the economy. Interest payments also eat up an increasing portion of government spending that cannot be used for more productive purposes.



29. Assume that you are employed by the government of Tanzania in 1964, a new nation recently independent from Britain. The Tanzanian parliament has decided that it will spend 10 million shillings on schools, roads, and healthcare for the year. You estimate that the net taxes for the year are eight million shillings. The difference will be financed by selling 10-year government bonds at 12% interest per year. The interest on outstanding bonds must be added to government expenditure each year. Assume that additional taxes are added to finance this increase in government expenditure so the gap between government spending is always two million. If the school, road, and healthcare budget is unchanged, compute the value of the accumulated debt in 10 years.

Solution: Since the budget deficit is always 2 million shillings, the accumulated debt after 10 years will be 20 million shillings.

CHAPTER 19: MACROECONOMIC POLICY AROUND THE WORLD

Self-Check Questions

1. Using the data provided in the table below, rank the seven regions of the world according to GDP and then according to GDP per capita.

	Population (in millions)	GDP Per Capita	GDP = Population × Per Capita GDP (in millions)
East Asia	1,992	$5,246	$10,450,032
South Asia	1,649	$1,388	$2,288,812
Sub-Saharan Africa	910	$1,415	$1,287,650
Latin America	581	$9,190	$5,339,390
Middle East and North Africa*	340	$4,535	$1,541,900
Europe and Central Asia	272	$6,847	$1,862,384

Solution: See the tables below for the answer.

Country	GDP (in millions)
East Asia	$10,450,032
Latin America	$5,339,390
South Asia	$2,288,812
Europe and Central Asia	$1,862,384
Middle East and North Africa*	$1,541,900
Sub-Saharan Africa	$1,287,650

Country	GDP Per Capita (in millions)
Europe and Central Asia	$9,190
Sub-Saharan Africa	$6,847
East Asia	$5,246
Middle East and North Africa*	$4,535
South Asia	$1,415
Latin America	$1,388

East Asia appears to be the largest economy on GDP basis, but on a per capita basis it drops to third, after Europe and Central Asia and Sub-Saharan Africa.

2. What are the drawbacks to analyzing the global economy on a regional basis?

Solution: A region can have some of high-income countries and some of the low-income countries. Aggregating per capita real GDP will vary widely across countries within a region, so aggregating data for a region has little meaning. For example, if one were to compare per capital real GDP for the United States, Canada, Haiti, and Honduras, it looks much different than if you looked at the same data for North America as a whole. Thus, regional comparisons are broad-based and may not adequately capture an individual country's economic attributes.

3. Create a table that identifies the macroeconomic policies for a high-income country, a middle-income country, and a low-income country.

Solution: The table below provides a summary of possible answers.

High-Income Countries	Middle-Income Countries	Low-Income Countries
• More educated workforce • Create, invest in, and apply new technologies • Adopt fiscal policies focused on investment, including investment in human capital, in technology, and in physical plant and equipment. • Create stable and market-oriented economic climate • Monetary policy to keep inflation low and stable • Minimize the risk of exchange rate fluctuations, while also encouraging domestic and international competition	• Invest in technology, human capital, and physical capital • The incentives of a market-oriented economic context • Work to reduce government economic controls on market activities • Deregulate the banking and financial sector • Reduce protectionist policies	• The eradication of poverty and extreme hunger • Achieving universal primary education • Promoting gender equality • Reducing child mortality rates • Improving maternal health • Combating HIV/AIDS, malaria, and other diseases • Ensuring environmental sustainability • Developing global partnerships for development

4. Use the data in the text to contrast the policy prescriptions of the high-income, middle-income, and low-income countries.

Solution: Fundamental policies that must be nurtured are adopting of government policies that are market-oriented and educating the work force and population. After this is done, low-income countries focus on eradication of other social ills that inhibit their growth. The economically challenged are stuck in poverty traps. They need to focus more on health and education and create a stable macroeconomic and political environment. This will attract foreign aid and foreign investment. Middle-income countries strive for increases in physical capital and innovation, while higher-income countries must work to maintain their economies through innovation and technology.

5. What are the different policy tools for dealing with cyclical unemployment?

Solution: If there is a recession and unemployment increases, we can call on an expansionary fiscal (lower taxes or increased government spending) policy or an expansionary monetary policy (increase money supply and lower interest rates). Both policies stimulate output and decrease unemployment.

6. Explain how the natural rate of unemployment may be higher in low-income countries.

Solution: Aside from a high natural rate of unemployment due to government regulations, subsistence households may be counted as not working.

7. How does indexing wage contracts to inflation help workers?

Solution: Indexing wage contracts means wages rise when prices rise. This means what you can buy with your wages, your standard of living, remains the same. When wages are not indexed, or rise with inflation, your standard of living falls.

8. Use the AD/AS model to show how increases in government spending can lead to more inflation.

Solution: An increase in government spending shifts the AD curve to the right, raising both income and price levels.

9. Show, using the AD/AS model, how monetary policy can be used to decrease the price level.

Solution: RA reduction in the money supply will decrease aggregate demand and cause prices to drop.

10. What do international flows of capital have to do with trade imbalances?

Solution: Given the high level of activity in international financial markets, it is typically believed that financial flows across borders are the real reason for trade imbalances. For example, the United States had an enormous trade deficit in the late 1990s and early 2000s because it was attracting vast inflows of foreign capital. Smaller countries that have attracted such inflows of international capital worry that if the inflows suddenly turn to outflows, the resulting decline in their currency could collapse their banking system and bring on a deep recession.

11. Use the demand-and-supply of foreign currency graph to determine what would happen to a small, open economy that experienced capital outflows.

Solution: The demand for the country's currency would decrease, lowering the exchange rate.

Review Questions

12. What is the primary way in which economists measure standards of living?

Solution: GDP per capita is the most common measure of the standard of living.

13. What are some of the other ways of comparing the standard of living in countries around the world?

Solution: Some economists try to use happiness metric, while others look at health care statistics such as life expectancy and infant mortality.

14. What are the four other factors that determine the economic standard of living around the world?

Solution: Geography, demography, industrial structure and institutions.

15. What other factors, aside from labor productivity, capital investment, and technology, impact the economic growth of a country? How?

Solution: One major factor is strong social and legal institutions, such as the protection of private property and a functioning court system. These protect the fruits of labor and provide incentives to innovate and create wealth.

16. What strategies were employed by the East Asian Tigers to stimulate economic growth?

Solution: High savings rates, investment in human capital, seeking out appropriate technologies and letting free markets work uninhibited.

17. What are the two types of unemployment problems?

Solution: Unemployment during a recession and the natural rate of unemployment.

18. In low-income countries, does it make sense to argue that most of the people without long-term jobs are unemployed?

Solution: They are not unemployed in the same sense that we use the term in Western countries because the structure of their economy is different.

19. Is inflation likely to be a severe problem for at least some high-income economies in the near future?

Solution: Most high-income countries have learned not to let high inflation occur, so this is unlikely to be a serious problem.

20. Is inflation likely to be a problem for at least some low- and middle-income economies in the near future?

Solution: Yes, low-income countries without disciplined macroeconomic policies are at risk for high inflation.

21. What are the major issues with regard to trade imbalances for the U.S. economy?

Solution: Attempts to reduce the trade imbalance could lead to rapid depreciation of the dollar, inflation and recession.

22. What are the major issues with regard to trade imbalances for low- and middle-income countries?

Solution: A sudden influx of capital to correct the trade imbalances in these countries can lead to irresponsible lending and widespread loan defaults, resulting in financial crisis.

Critical Thinking Questions

23. Demography can have important economic effects. The United States has an aging population. Explain one economic benefit and one economic cost of an aging population as well as of a population that is very young.

Solution: The benefit of having an aging population is a greater share of experienced, high-skilled workers, but the drawback is that as they leave the labor force, more resources have to be devoted to senior care by a smaller generation of young people.

24. Explain why is it difficult to set aside funds for investment when you are in poverty.

Solution: When you are in poverty, all of your income tends to go towards immediate needs such as food and shelter, with none left over for investment.

25. Why do you think it is difficult for high-income countries to achieve high growth rates?

Solution: High-income countries have already implemented the reforms that result in the highest growth rates, and there are diminishing marginal returns from future reforms.

26. Is it possible to protect workers from being fired without distorting the labor market?

Solution: No. Protecting workers from being fired provides a strong disincentive for employers to hire, since they will not be able to get rid of employees who turn out to be poor performers, so the labor market will be distorted.

27. Explain what will happen in a nation that tries to solve a structural unemployment problem using expansionary monetary and fiscal policy. Draw one AD/AS diagram, based on the Keynesian model, for what the nation hopes will happen. Then draw a second AD/AS diagram, based on the neoclassical model, for what is more likely to happen.

Solution: Expansionary fiscal or monetary policy could be used to address a cyclical unemployment problem, but they are unlikely to solve a structural unemployment problem since the latter is caused by is a mismatch of skills in the economy that cannot be correct by a simple expansion of demand. The result is likely only inflation with no reduction in structural unemployment. A Keynesian AS curve would be a horizontal line at the current price level, and a Neoclassical curve would be a vertical line at potential GDP. Together, they make a backwards "L-shape" with the kink at the current price level and potential GDP.

28. Why are inflationary dangers less in the high-income economies than in low-income and middle-income economies around the world?

Solution: Since there is a greater amount of money in a high-income economy, it requires a much greater increase in the money supply to cause significant inflation.

29. Explain why converging economies may present a strong argument for limiting flows of capital but not for limiting trade.

Solution: Limiting capital flows guards against the risk that sudden capital flight will result in recession. Trade itself carries no such risk and increases the standard of living for the countries involved.

Problems

30. Retrieve the following data from The World Bank database (http:/databank.worldbank.org/data/home.aspx) for India, Spain, and South Africa for the most recent year available:

- **GDP in constant international dollars or PPP**
- **Population**
- **GDP per person in constant international dollars**
- **Mortality rate, infant (per 1,000 live births)**
- **Health expenditure per capita (current U.S. dollars)**
- **Life expectancy at birth, total (years)**

Solution:

India: GDP = $4.8 trillion Population = 1.2 billion GDP per capita = $3,910 Mortality rate = 56.3 Health expenditures per capita = 141.1 Life expectancy = 66.0
Spain: GDP = $1.5 trillion Population = 46 million GDP per capita = $31,670 Mortality rate = 4.5 Health expenditures per capita = $3,040.8 Life expectancy = 82.3
South Africa: GDP = $563 billion Population = 51 billion GDP per capita = $11,010 Mortality rate = 44.6 Health expenditures per capita = $942.5 Life expectancy = 55.3

31. Prepare a chart that compares India, Spain, and South Africa based on the data you find. Describe the key differences between the countries. Since you have ranked these countries in the Work It Out feature as high-, medium-, and low-income countries, explain what is surprising or expected about this data.

Solution: Exercise left to the student.

32. Use the Rule of 72 to estimate how long it will take for India, Spain, and South Africa to double their standards of living.

Solution: The rule of 72 an economy growing at 1% a year will double in approximately 72 years. Using the data you obtained, divide 72 by the growth rate for each country to determine the length of time it will take for their economies to double.

33. Using the research skills you have acquired, retrieve the following data from The World Bank database (http://databank.worldbank.org/data/home.aspx) for India, Spain, and South Africa for 2008–2012, if available:

- **Telephone lines**
- **Mobile cellular subscriptions**
- **Secure Internet servers (per one million people)**
- **Electricity production (kWh)**

Prepare a chart that compares these three countries. Describe the key differences between the countries.

Solution: Exercise left to the student.

34. Retrieve the unemployment data from The World Bank database (http://databank.worldbank.org/data/home.aspx) for India, Spain, and South Africa for 2008–2012.Prepare a chart that compares India, Spain, and South Africa based on the data you found in Exercise 19.30. Describe the key differences between the countries. Since you have ranked these countries in the Work It Out feature as high-, medium-, and low-income countries, explain what is surprising or expected about this data. How were these countries impacted by the Great Recession?

Solution: Exercise left to the student.

35. Retrieve inflation data from The World Bank data base (http://databank.worldbank.org/data/home.aspx) for India, Spain, and South Africa for 2008–2012.Prepare a chart that compares India, Spain, and South Africa based on the data you found in Exercise 19.30. Describe the key differences between the countries. Since you have ranked these countries in the Work It Out feature as high-, medium-, and low-income countries, explain what is surprising or expected about this data.

Solution: Exercise left to the student.

CHAPTER 20: INTERNATIONAL TRADE

Self-Check Questions

1. True or False: The source of comparative advantage must be natural elements like climate and mineral deposits. Explain.

Solution: False. Anything that leads to different levels of productivity between two economies can be a source of comparative advantage. For example, the education of workers, the knowledge base of engineers and scientists in a country, the part of a split-up value chain where they have their specialized learning, economies of scale, and other factors can all determine comparative advantage.

2. Brazil can produce 100 pounds of beef or 10 autos; in contrast the United States can produce 40 pounds of beef or 30 autos. Which country has the absolute advantage in beef? Which country has the absolute advantage in producing autos? What is the opportunity cost of producing one pound of beef in Brazil? What is the opportunity cost of producing one pound of beef in the United States?

Solution: Brazil has the absolute advantage in producing beef and the United States has the absolute advantage in autos. The opportunity cost of producing one pound of beef is 1/10 of an auto; in the United States it is 3/4 of an auto.

3. In France it takes one worker to produce one sweater, and one worker to produce one bottle of wine. In Tunisia it takes two workers to produce one sweater, and three workers to produce one bottle of wine. Who has the absolute advantage in production of sweaters? Who has the absolute advantage in the production of wine? How can you tell?

Solution: In answering questions like these, it is often helpful to begin by organizing the information in a table, such as in Table 20_07 Notice that, in this case, the productivity of the countries is expressed in terms of how many workers it takes to produce a unit of a product.

Country	One Sweater	One Bottle of wine
France	1 worker	1 worker
Tunisia	2 workers	3 workers

In this example, France has an absolute advantage in the production of both sweaters and wine. You can tell because it takes France less labor to produce a unit of the good.

4. In Germany it takes three workers to make one television and four workers to make one video camera. In Poland it takes six workers to make one television and 12 workers to make one video camera.

a. Who has the absolute advantage in the production of televisions? Who has the absolute advantage in the production of video cameras? How can you tell?

b. Calculate the opportunity cost of producing one additional television set in Germany and in Poland. (Your calculation may involve fractions, which is fine.) Which country has a comparative advantage in the production of televisions?

c. Calculate the opportunity cost of producing one video camera in Germany and in Poland. Which country has a comparative advantage in the production of video cameras?

d. In this example, is absolute advantage the same as comparative advantage, or not?

e. **In what product should Germany specialize? In what product should Poland specialize?**

Solution

a. In Germany, it takes fewer workers to make either a television or a video camera. Thus Germany has an absolute advantage in the production of both goods.
b. Producing an additional television in Germany requires three workers. Shifting those three German workers will reduce video camera production by 3/4 of a camera. Producing an additional television set in Poland requires six workers, and shifting those workers from the other good reduces output of video cameras by 6/12 camera, or 1/2. Thus, the opportunity cost of producing televisions is lower in Poland, so Poland has the comparative advantage in the production of televisions. (Note: Do not let the fractions like 3/4 of a camera or 1/2 of a video camera bother you. If either country was to expand television production by a significant amount—that is, lots more than one unit—then we will be talking about whole cameras and not fractional ones.) You can also spot this conclusion by noticing that Poland's absolute disadvantage is relatively lower in televisions, because Poland needs twice as many workers to produce a television but three times as many to produce a video camera, so the product with the relatively lower absolute disadvantage is Poland's comparative advantage.
c. Producing a video camera in Germany requires four workers, and shifting those four workers away from television production has an opportunity cost of 4/3 television sets. Producing a video camera in Poland requires 12 workers, and shifting those 12 workers away from television production has an opportunity cost of two television sets. Thus, the opportunity cost of producing video cameras is lower in Germany, and video cameras will be Germany's comparative advantage.
d. In this example, absolute advantage differs from comparative advantage. Germany has the absolute advantage in the production of both goods, but Poland has a comparative advantage in the production of televisions.
e. Germany should specialize, at least to some extent, in the production of video cameras, export video cameras, and import televisions. Conversely, Poland should specialize, at least to some extent, in the production of televisions, export televisions, and import video cameras.

5. **How can there be any economic gains for a country from both importing and exporting the same good, like cars?**

Solution: There are a number of possible advantages of intra-industry trade. Both nations can take advantage of extreme specialization and learning in certain kinds of cars with certain traits, like gas-efficient cars, luxury cars, sport-utility vehicles, higher- and lower-quality cars, and so on. Moreover, nations can take advantage of economies of scale, so that large companies will compete against each other across international borders, providing the benefits of competition and variety to customers. This same argument applies to trade between U.S. states, where people often buy products made by people of other states, even though a similar product is made within the boundaries of their own state. All states—and all countries—can benefit from this kind of competition and trade.

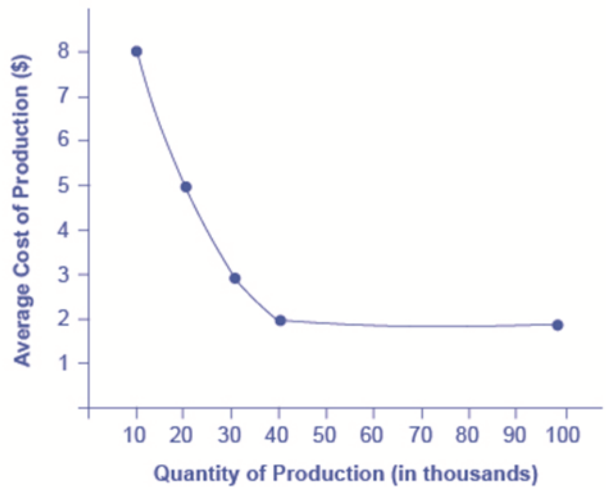
6. **The table below shows how the average costs of production for semiconductors (the "chips" in computer memories) change as the quantity of semiconductors built at that factory increases.**
   a. **Based on these data, sketch a curve with quantity produced on the horizontal axis and average cost of production on the vertical axis. How does the curve illustrate economies of scale?**
   b. **If the equilibrium quantity of semiconductors demanded is 90,000, can this economy take full advantage of economies of scale? What about if quantity demanded is 70,000 semiconductors? 50,000 semiconductors? 30,000 semiconductors?**

c. **Explain how international trade could make it possible for even a small economy to take full advantage of economies of scale, while also benefiting from competition and the variety offered by several producers.**

Quantity of Semiconductors	**Average Total Cost**
10,000	**$8 each**
20,000	**$5 each**
30,000	**$3 each**
40,000	**$2 each**
100,000	**$2 each**

Solution

a. Start by plotting the points on a sketch diagram and then drawing a line through them. The figure below illustrates the average costs of production of semiconductors.



b. The curve illustrates economies of scale by showing that as the scale increases—that is, as production at this particular factory goes up—the average cost of production declines. The economies of scale exist up to an output of 40,000 semiconductors; at higher outputs, the average cost of production does not seem to decline any further.

c. At any quantity demanded above 40,000, this economy can take full advantage of economies of scale; that is, it can produce at the lowest cost per unit. Indeed, if the quantity demanded was quite high, like 500,000, then there could be a number of different factories all taking full advantage of economies of scale and competing with each other. If the quantity demanded falls below 40,000, then the economy by itself, without foreign trade, cannot take full advantage of economies of scale.

d. The simplest answer to this question is that the small country could have a large enough factory to take full advantage of economies of scale, but then export most of the output. For semiconductors, countries like Taiwan and Korea have recently fit this description. Moreover, this country could also import semiconductors from other countries which also have large factories, thus getting the benefits of competition and variety. A slightly more complex answer is that the country can get these benefits of economies of scale without producing semiconductors, but simply by buying semiconductors made at low cost around the world. An economy, especially a smaller country, may well end up specializing and producing a few items on a large scale, but then trading those items for other items produced on a large scale, and thus gaining the benefits of economies of scale by trade, as well as by direct production.

7. If the removal of trade barriers is so beneficial to international economic growth, why would a nation continue to restrict trade on some imported or exported products?

Solution: A nation might restrict trade on imported products to protect an industry that is important for national security. For example, nation X and nation Y may be geopolitical rivals, each with ambitions of increased political and economic strength. Even if nation Y has comparative advantage in the production of missile defense systems, it is unlikely that nation Y would seek to export those goods to nation X. It is also the case that, for some nations, the production of a particular good is a key component of national identity. In Japan, the production of rice is culturally very important. It may be difficult for Japan to import rice from a nation like Vietnam, even if Vietnam has a comparative advantage in rice production.

Review Questions

8. What is absolute advantage? What is comparative advantage?

Solution: Absolute advantage is when one country is able to produce more of a good than another. Comparative advantage is when a country has a lower opportunity cost to produce the good than another.

9. Under what conditions does comparative advantage lead to gains from trade?

Solution: Comparative advantage leads to gains from trade when countries specialize and produce mainly what they do best.

10. What factors does Paul Krugman identify that supported the expansion of international trade in the 1800s?

Solution: The improvements in transportation that came with steamships and railroads and created international markets.

11. Is it possible to have a comparative advantage in the production of a good but not to have an absolute advantage? Explain.

Solution: Yes. Comparative advantage is defined by what you have to give up to produce a good. If the opportunity cost of production is low, a country will still have a comparative advantage even when at an absolute disadvantage.

12. How does comparative advantage lead to gains from trade?

Solution: By each country specializing in what it does best, the total amount of production increases and all parties can gain from trade.

13. What is intra-industry trade?

Solution: Trade that takes place within a specific industry.

14. What are the two main sources of economic gains from intra-industry trade?

Solution: The division of labor leads to improvements in skill, and economies of scale.

15. What is splitting up the value chain?

Solution: Splitting up the value chain involves different countries undertaking different stages of production for a good.

16. Are the gains from international trade more likely to be relatively more important to large or small countries?

Solution: They are more likely to be relatively more important to small countries, where absolute advantage is smaller and it would be difficult to produce everything the population wants or needs domestically.

Critical Thinking Questions

17. Are differences in geography behind the differences in absolute advantages?

Solution: To a certain extent, yes. Greater natural resources or access to the sea can lead to absolute advantage for certain goods.

18. Why does the United States not have an absolute advantage in coffee?

Solution: The climate in the United States is not ideal for growing coffee, so countries closer to the equator tend to have a greater absolute advantage.

19. Look at Exercise 20.2. Compute the opportunity costs of producing sweaters and wine in both France and Tunisia. Who has the lowest opportunity cost of producing sweaters and who has the lowest opportunity cost of producing wine? Explain what it means to have a lower opportunity cost.

Solution: Tunisia has the lower opportunity cost for producing sweaters, because it only has to give up 2/3 of a bottle of wine for each sweater, whereas France has to give up 1 bottle of wine for each sweater. France has the lower opportunity cost of producing wine, because it only has to give up one sweater per bottle of wine, whereas Tunisia has to give up 1 1/2 sweaters. The opportunity cost of a good is what you have to give up to get it.

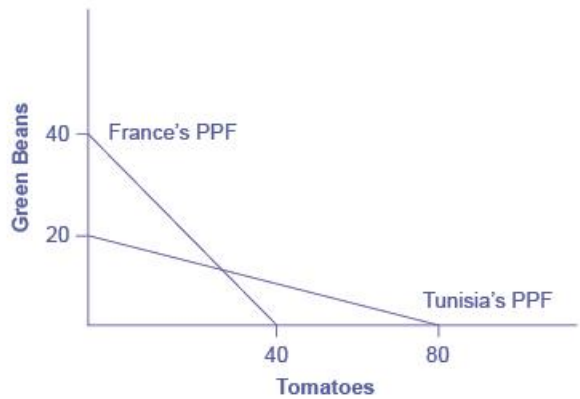
Problems

20. France and Tunisia both have Mediterranean climates that are excellent for producing/harvesting green beans and tomatoes. In France is takes two hours for each worker to harvest green beans and two hours to harvest a tomato. Tunisian workers only need one hour to harvest the tomatoes but four hours to harvest green beans. Assume there are only two workers and each worker works 40 hours a week.

a. **Draw a production possibilities frontier for each country. (Hint: Remember the production possibility frontier is the maximum that all workers can produce at a unit of time which, in this problem, is a week**
b. **Identify which country has the absolute advantage in green beans and which country has the absolute advantage in tomatoes.**
c. **Identify which country has the comparative advantage.**
d. **How much would France have to give up in terms of tomatoes to gain from trade? How much would it have to give up in terms of green beans?**

Solution:

a. The PPF for France will range from forty green beans to forty tomatoes. The PPF for Tunisia will range from twenty green beans to eighty tomatoes.



b. Tunisia has the absolute advantage in tomatoes and France has the absolute advantage in green beans.
c. France has a comparative advantage in green beans and Tunisia has a comparative advantage in tomatoes.
d. Even giving up one tomato would allow France to gain from trade, since it could exchange the additional green bean for four tomatoes with Tunisia. France should not give up any green beans, but instead produce them exclusively, since it can trade each green bean with Tunisia for four tomatoes.

21. In Japan, one worker can make 5 tons of rubber or 80 radios. In Malaysia, one worker can make 10 tons of rubber or 40 radios.

a. Who has the absolute advantage in the production of rubber or radios? How can you tell?
b. Calculate the opportunity cost of producing 80 additional radios in Japan and in Malaysia. (Your calculation may involve fractions, which is fine.) Which country has a comparative advantage in the production of radios?
c. Calculate the opportunity cost of producing 10 additional tons of rubber in Japan and in Malaysia. Which country has a comparative advantage in producing rubber?
d. In this example, does each country have an absolute advantage and a comparative advantage in the same good, or not?
e. In what product should Japan specialize? In what product should Malaysia specialize?

Solution:

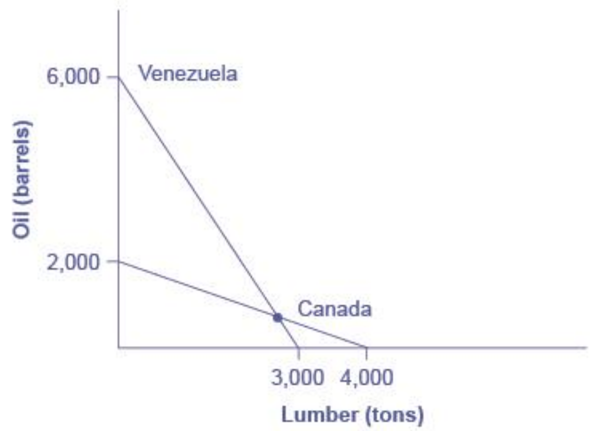
a. Malaysia has the absolute advantage in rubber, because the cost in terms of workers is less (1 ton rubber requires 1/10 worker in Malaysia, but 1/5 worker in Japan). Japan has the absolute advantage in radios, because the cost of a radio is 1/80 compared to 1/40 in Malaysia.
b. In Japan, the opportunity cost of producing 80 extra radios is 5 tons of rubber. In Malaysia, it is 20 tons of rubber. Japan has the comparative advantage in radios.
c. In Japan, the opportunity cost of producing 10 extra tons of rubber is 160 radios. In Malaysia, it is 40 radios. Malaysia has the comparative advantage in rubber.
d. Yes, absolute and comparative advantage are the same in this example.
e. Based on their comparative advantage, Japan should produce radios while Malaysia should produce rubber.

22. Review the numbers for Canada and Venezuela from Table 20_13. This describes how many barrels of oil and tons of lumber can be produced by workers. Use these numbers to answer the rest of this question.

a. **Draw a production possibilities frontier for each country. Assume there are 100 workers in each country. Canadians and Venezuelans desire both oil and lumber. Canadians want at least 2000 tons of lumber. Mark a point on their production possibilities where they can get at least 3000 tons.**
b. **Assume that the Canadians specialize completely because they figured out they have a comparative advantage in lumber. They are willing to give up 1000 tons of lumber. How much oil should they ask for in return for this lumber to be as well off as they were with no trade? How much should they ask for if they want to gain from trading with Venezuela? (Note: We can think of this "ask" as the relative price or trade price of lumber.)**
c. **Is the Canadian "ask" you identified in (b) also beneficial for Venezuelans? Use the production possibilities frontier graph for Venezuela to show that Venezuelans can gain from trade.**

Solution:

a.



b. Canada can produce between 2000 barrels of oil and 4000 tons of lumber. Venezuela can produce between 6000 barrels of oil and 3000 tons of lumber
c. They should get at least 500 barrels of oil for their 1000 tons of lumber. Asking for more than this will result in gains from trade. This price is also beneficial for Venezuela, for if they wanted to produce 1000 tons of lumber themselves, it would cost 2000 barrels of oil.

23. In Exercise 20.31, is there an "ask" where Venezuelans may say "no thank you" to trading with Canada?

Solution: If Canada asks for more than 2000 barrels of oil for their lumber, it would be cheaper for Venezuela to produce it themselves.

24. From earlier chapters you will recall that technological change shifts the average cost curves. Draw a graph showing how technological change could influence intra-industry trade.

Solution: The improvement in technology will shift average costs for firms down increase intra-industry trade.

25. Consider two countries: South Korea and Taiwan. Taiwan can produce one million mobile phones per day at the cost of $10 per phone and South Korea can produce 50 million mobile phones at $5 per phone. Assume these phones are the same type and quality and there is only one price. What is the minimum price at which both countries will engage in trade?

Solution: Taiwan will not be able to compete in the market with South Korea, whose economies of scale allow the production of more phones at a lower price. South Korea has no reason to pay a higher price for Taiwanese phones, and Taiwan cannot sell at South Korea's prices without taking a loss.

26. If trade increases world GDP by 1% per year, what is the global impact of this increase over 10 years? How does this increase compare to the annual GDP of a country like Sri Lanka? Discuss. (Hint: To answer this question, here are steps you may want to consider. Go to the World Development Indicators (online) published by the World Bank. Find the current level of World GDP in constant international dollars. Also, find the GDP of Sri Lanka in constant international dollars. Once you have these two numbers, compute the amount the additional increase in global incomes due to trade and compare that number to Sri Lanka's GDP.)

Solution: Global GDP will increase be 1.01^10 x 100 = 110.5% of the current level after 10 years, an increase of 10.5%, which comes to about $90 trillion. The GDP of Sri Lanka, by comparison, is only about $3 trillion.

CHAPTER 21: GLOBALIZATION AND PROTECTIONISM

Self-Check Questions

1. **Explain how a tariff reduction causes an increase in the equilibrium quantity of imports and a decrease in the equilibrium price.**

Solution: This is the opposite case of the Work It Out feature in this module. A reduced tariff is like a decrease in the cost of production, which is shown by a downward (or rightward) shift in the supply curve.

2. **Explain how a subsidy on agricultural goods like sugar adversely affects the income of foreign producers of imported sugar.**

Solution: A subsidy is like a reduction in cost. This shifts the supply curve down (or to the right), driving the price of sugar down. If the subsidy is large enough, the price of sugar can fall below the cost of production faced by foreign producers, which means they will lose money on any sugar they produce and sell.

3. **Explain how trade barriers save jobs in protected industries, but only by costing jobs in other industries.**

Solution: Trade barriers raise the price of goods in protected industries. If those products are inputs in other industries, it raises their production costs and then prices, so sales fall in those other industries. Lower sales lead to lower employment. Additionally, if the protected industries are consumer goods, their customers pay higher prices which reduce demand for other consumer products and thus employment in those industries.

4. **Explain how trade barriers raise wages in protected industries by reducing average wages economy-wide.**

Solution: Trade based on comparative advantage raises the average wage rate economy-wide, though it can reduce the incomes of import-substituting industries. By moving away from a country's comparative advantage, trade barriers do the opposite: they give workers in protected industries an advantage, while reducing the average wage economy-wide.

5. **How does international trade affect working conditions of low-income countries?**

Solution: By raising incomes, trade tends to raise working conditions also, even though those conditions may not (yet) be equivalent to those in high-income countries.

6. **Do the jobs for workers in low-income countries that involve making products for export to high-income countries typically pay these workers more or less than their next-best alternative?**

Solution: They typically pay more than the next-best alternative. If a Nike firm did not pay workers at least as much as they would earn, for example, in a subsistence rural lifestyle, they many never come to work for Nike.

7. How do trade barriers affect the average income level in an economy?

Solution: Since trade barriers raise prices, real incomes fall. The average worker would also earn less.

8. How does the cost of "saving" jobs in protected industries compare to the workers' wages and salaries?

Solution: Workers working in other sectors and the protected sector see a decrease in their real wage.

9. Explain how predatory pricing could be a motivation for dumping.

Solution: If imports can be sold at extremely low prices, domestic firms would have to match those prices to be competitive. By definition, matching prices would imply selling under cost and, therefore, losing money. Firms cannot sustain losses forever. When they leave the industry, importers can "take over," raising prices to monopoly levels to cover their short-term losses and earn long-term profits.

10. Why do low-income countries like Brazil, Egypt, or Vietnam have lower environmental standards than high-income countries like the Germany, Japan, or the United States?

Solution: Because low-income countries need to provide necessities—food, clothing, and shelter—to their people. In other words, they consider environmental quality a luxury.

11. Explain the logic behind the "race to the bottom" argument and the likely reason it has not occurred.

Solution: Low-income countries can compete for jobs by reducing their environmental standards to attract business to their countries. This could lead to a competitive reduction in regulations, which would lead to greater environmental damage. While pollution management is a cost for businesses, it is tiny relative to other costs, like labor and adequate infrastructure. It is also costly for firms to locate far away from their customers, which many low-income countries are.

12. What are the conditions under which a country may use the unsafe products argument to block imports?

Solution: The decision should not be arbitrary or unnecessarily discriminatory. It should treat foreign companies the same way as domestic companies. It should be based on science.

13. Why is the national security argument not convincing?

Solution: Restricting imports today does not solve the problem. If anything, it makes it worse since it implies using up domestic sources of the products faster than if they are imported. Also, the national security argument can be used to support protection of nearly any product, not just things critical to our national security, for example, products like mohair that were protected decades ago while we have plentiful substitutes for them today.

14. Assume a perfectly competitive market and the exporting country is small. Using a demand and supply diagram, show the impact of increasing standards on a low-income exporter of toys. Show the impact of a tariff. Is the effect on the price of toys the same or different? Why is a standards policy preferred to tariffs?

Solution: The effect of increasing standards may increase costs to the small exporting country. The supply curve of toys will shift to the left. Exports will decrease and toy prices will rise. Tariffs also raise prices. So the effect on the price of toys is the same. A tariff is a "second best" policy and also affects other sectors. However, a common standard across countries is a "first best" policy that attacks the problem at its root.

15. What is the difference between a free trade association, a common market, and an economic union?

Solution: A free trade association offers free trade between its members, but each country can determine its own trade policy outside the association. A common market requires a common external trade policy in addition to free trade within the group. An economic union is a common market with coordinated fiscal and monetary policy.

16. Why would countries promote protectionist laws, while also negotiate for freer trade internationally?

Solution: International agreements can serve as a political counterweight to domestic special interests, thereby preventing stronger protectionist measures.

17. What might account for the dramatic increase in international trade over the past 50 years?

Solution: Reductions in tariffs, quotas, and other trade barriers, improved transportation, and communication media have made people more aware of what is available in the rest of the world.

18. How does competition, whether domestic or foreign, harm businesses?

Solution: Competition from firms with better or cheaper products can reduce a business's profits, and may drive it out of business. Workers would similarly lose income or even their jobs.

19. What are the gains from competition?

Solution: Consumers get better or less expensive products. Businesses with the better or cheaper products increase their profits. Employees of those businesses earn more income. On balance, the gains outweigh the losses to a nation.

Review Questions

20. Who does protectionism protect? What does it protect them from?

Solution: Protectionism protects domestic industries from foreign competition.

21. Name and define three policy tools for enacting protectionism.

Solution: Tariffs, or taxes on imported goods, import quotas, which limit the number of goods that can be imported, and nontariff barriers, which cover all rules, regulations and contracts involving imports.

22. How does protectionism affect the price of the protected good in the domestic market?

Solution: Protectionism increases the price of the protected good by keeping out foreign competition.

23. Does international trade, taken as a whole, increase the total number of jobs, decrease the total number of jobs, or leave the total number of jobs about the same?

Solution: It increases the number of jobs, because the gains from trade create wealth and spur on further production.

24. Is international trade likely to have roughly the same effect on the number of jobs in each individual industry?

Solution: No, different industries will be impacted differently depending on relative prices and industrial structures.

25. How is international trade, taken as a whole, likely to affect the average level of wages?

Solution: Trade tends to increase the average wage as workers are able to be more productive.

26. Is international trade likely to have about the same effect on everyone's wages?

Solution: No, some people will see wage increases while others will see wages decline.

27. What are main reasons for protecting "infant industries"? Why is it difficult to stop protecting them?

Solution: Protecting infant industries is done to give them time to develop, become efficient and be profitable. The fear is that a new industry may be crushed by competition before it has a chance to develop a valuable new product or technology. However, once these protections are in place, they will not relinquish them without a fight, and repeal is difficult.

28. What is dumping? Why does prohibiting it often work better in theory than in practice?

Solution: Dumping is the selling of goods below their cost of production. Anti-dumping laws are problematic because of the difficulties in determining what the right price should be and the tendency for political motives to corrupt the process.

29. What is the "race to the bottom" scenario?

Solution: This happens when countries compete to attract business by weakening environmental standards until all such standards have been eliminated in the bidding war.

30. Do the rules of international trade require that all nations impose the same consumer safety standards?

Solution: The WTO allows countries to set their own standards of consumer safety.

31. What is the national interest argument for protectionism with regard to certain products?

Solution: If there is a war or other international conflict, countries may be unable to acquire goods through trade, so it is important that they have the capacity to produce them domestically.

32. Name several of the international treaties where countries negotiate with each other over trade policy.

Solution: The North American Free Trade Agreement, the European Union and the Asia Pacific Economic Cooperation are among the major treaties.

33. What is the general trend of trade barriers over recent decades: higher, lower, or about the same?

Solution: Trade barriers have generally been reduced in recent decades.

34. If opening up to free trade would benefit a nation, then why do nations not just eliminate their trade barriers, and not bother with international trade negotiations?

Solution: Trade agreements ensure that all participants follow the same trade rules, which would not be the case if one country removed its trade barriers unilaterally. This also allows for the exclusion of other countries to punish them for policies of which the trading countries disapprove.

35. Who gains and who loses from trade?

Solution: Consumers gain from trade, but domestic producers can lose out.

36. Why is trade a good thing if some people lose?

Solution: Trade benefits overall wealth and long term economic growth, so even if some people lose in the short term it is better for everyone in the long term.

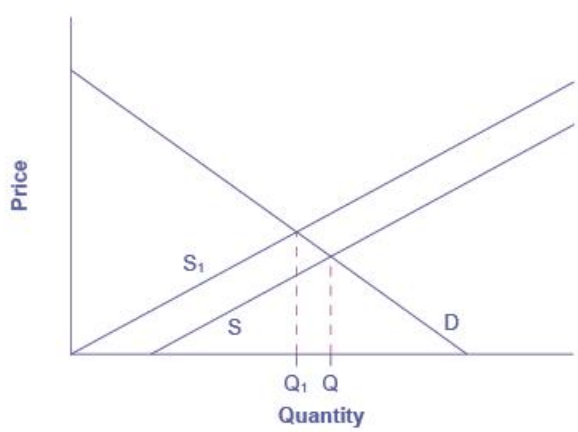
37. What are some ways that governments can help people who lose from trade?

Solution: Sometimes governments subsidize domestic industries that lose from trade, or help workers retrain for more competitive professions.

Critical Thinking Questions

38. Show graphically that for any tariff, there is an equivalent quota that would give the same result. What would be the difference, then, between the two types of trade barriers? Hint: It is not something you can see from the graph.

Solution: The tariff can raise revenue for a government, while an import quota cannot. In either case, the price for consumers is higher and the producer receives a lower price for his good.



39. From the Work It Out feature titled "Effects of Trade Barriers," you can see that a tariff raises the price of imports. What is interesting is that the price rises by less than the amount of the tariff. Who pays the rest of the tariff amount? Can you show this graphically?

Solution: The rest of the tariff is paid by the importer, i the same way that a tax is split between consumer and producer.

40. If trade barriers hurt the average worker in an economy (due to lower wages), why does government create trade barriers?

Solution: The government creates trade barriers to protect domestic industries, which might be driven to bankruptcy by foreign competition.

41. Why do you think labor standards and working conditions are lower in the low-income countries of the world than in countries like the United States?

Solution: Labor standards and working conditions reflect the income in a country. Strong labor standards are a luxury that low-income nations can't afford. If they were to mandate higher labor standards, wages would have to be reduced or prices of products raised. Given their low incomes, workers prefer wages to labor standards. Additionally, in order to remain competitive and export their goods, low-income countries don't have the luxury of enacting stricter standards.

42. How would direct subsidies to key industries be preferable to tariffs or quotas?

Solution: Direct subsidies do not inhibit international trade or restrict the products that consumers have access to.

43. How can governments identify good candidates for infant industry protection? Can you suggest some key characteristics of good candidates? Why are industries like computers not good candidates for infant industry protection?

Solution: It is difficult for governments to identify good candidates for infant industry protection, especially since all industries have incentives to lobby for such protection. The best examples are those which require a limited period of time to develop and become internationally competitive, after which the protection will be removed. Computers are not a good candidate because the technology changes so quickly that governments will end up protecting old technologies while the industry has moved on to something better.

44. Microeconomic theory argues that it economically rationale (and profitable) to sell additional output as long as the price covers the variable costs of production. How is this relevant to the determination of whether dumping has occurred?

Solution: Dumping occurs when price is below the average variable cost. If we know the variable cost faced by a company, we can tell whether they are engaging in dumping by comparing it to the price.

45. How do you think Americans would feel if other countries began to urge the United States to increase environmental standards?

Solution: Americans would be likely to resent the interference of other countries in our domestic economy.

46. Is it legitimate to impose higher safety standards on imported goods than exist in the foreign country where the goods were produced?

Solution: It is reasonable for a country to impose the same safety standards on all items consumed domestically, even if these are higher standards than exist in the country from which the imports come.

47. Why might the unsafe consumer products argument be a more effective strategy (from the perspective of the importing country) than using tariffs or quotas to restrict imports?

Solution: If products are really unsafe, putting tariffs on them will not eliminate consumption entirely, whereas the unsafe consumer products argument might be successful.

48. Why might a tax on domestic consumption of resources critical for national security be a more efficient approach than barriers to imports?

Solution: Such a tax would conserve these resources' availability for national security purposes in case the imported supply is cut off, while still allowing the gains from trade to occur.

49. Why do you think that the GATT rounds and, more recently, WTO negotiations have become longer and more difficult to resolve?

Solution: Like everything else, there are diminishing marginal returns in negotiation. If all of the best, most obvious policies have already been implemented, it will be more difficult to resolve the remaining issues.

50. An economic union requires giving up some political autonomy to succeed. What are some examples of political power countries must give up to be members of an economic union?

Solution: There are limits to the country's ability to protect its own industries from competition. In the case of the European Union, participating nations gave up the ability to conduct independent monetary policy.

51. What are some examples of innovative products that have disrupted their industries for the better?

Solution: The advent of cellular phones damaged many of the old companies providing landline service or those that sold pagers and answering machines, but the cell phone was a decided improvement over the previous technology, to give one example.

52. In principle, the benefits of international trade to a country exceed the costs, no matter whether the country is importing or exporting. In practice, it is not always possible to compensate the losers in a country, for example, workers who lose their jobs due to foreign imports. In your opinion, does that mean that trade should be inhibited to prevent the losses?

Solution: The student should give his or her own opinion.

53. Economists sometimes say that protectionism is the "second-best" choice for dealing with any particular problem. What they mean is that there is often a policy choice that is more direct or effective for dealing with the problem—a choice that would still allow the benefits of trade to occur. Explain why protectionism is a "second-best" choice for:

a. helping workers as a group
b. helping industries stay strong
c. protecting the environment
d. advancing national defense

Solution

a. Trade will ultimately increase wages for workers as a group, even if some workers lose out in the short run.
b. Competitive pressure helps industries stay strong. Blocking competition by hindering trade will ultimately weaken industries, not strengthen them.
c. Since trade is more efficient, the same output can be achieved at a lower cost to the environment.
d. Strong trading partners are less likely to enter into wars with each other, since it would be to both countries' economic disadvantage. Similarly, a trading partner is more likely to assist in a war with a third party in order to preserve the gains from trade.

54. Trade has income distribution effects. For example, suppose that because of a government-negotiated reduction in trade barriers, trade between Germany and the Czech Republic increases. Germany sells house paint to the Czech Republic. The Czech Republic sells alarm clocks to Germany. Would you expect this pattern of trade to increase or decrease jobs and wages in the paint industry in Germany? The alarm clock industry in Germany? The paint industry in Czech Republic? The alarm clock industry in Czech Republic? Sketch a demand and supply diagram for each of these four labor markets to illustrate your answer. What has to happen for there to be no increase in total unemployment in both countries?

Solution: It should increase jobs in the house paint industry in Germany due to increased international demand, but decrease jobs in the paint industry in the Czech Republic since Germany is supplying the product at a cheaper price The reverse is true for alarm clocks.

Problems

55. Assume two countries, Thailand (T) and Japan (J), have one good: cameras. The demand (d) and supply (s) for cameras in Thailand and Japan is described by the following functions:

$$\mathrm{Qd}^{T} = 60 - \mathrm{P}$$

$$\mathrm{Qs}^{T} = -5 + \frac{1}{4}\mathrm{P}$$

$$\mathrm{Qd}^{J} = 80 - \mathrm{P}$$

$$\mathrm{Qs}^{J} = -10 + \frac{1}{2}\mathrm{P}$$

P is the price measured in a common currency used in both countries, such as the Thai Baht.

a. Compute the equilibrium price (P) and quantities (Q) in each country without trade.
b. Now assume that free trade occurs. The free-trade price goes to 56.36 Baht. Who exports and imports cameras and in what quantities?

Solution

a. To compute equilibriums, we set quantity demanded equal to quantity supplied and solve. For Thailand: 60 - P = -5 + 1/4 P; P = 52. Q = 8. For Japan: 80 - P = -10 + 1/2P; P = 60. Q = 20.
b. At the new price, Thailand will produce -5 + 1/4(56.36) = 9.09 cameras and demand 60 - 56.36 = 3.64 cameras. Japan will produce -10 + 1/2(56.36) = 18.18 cameras and demand 80 - 56.36 = 23.64 cameras. So Japan will import at least 6 cameras (23.64 – 18.18) from Thailand (since frictions of cameras cannot be consumed.) Thailand will export those cameras.

56. You have just been put in charge of trade policy for Malawi. Coffee is a recent crop that is growing well and the Malawian export market is developing. As such, Malawi coffee is an infant industry. Malawi coffee producers come to you and ask for tariff protection from cheap Tanzanian coffee. What sorts of policies will you enact? Explain.

Solution: It would probably be better to directly subsidize Malawian coffee than to put tariffs on foreign coffee, as this would protect the infant industry while still allowing more consumer choice and the gains from trade, as well as forcing Malawian coffee to face world market prices.

57. The country of Pepperland exports steel to the Land of Submarines. Information for the quantity demanded (Qd) and quantity supplied (Qs) in each country, in a world without trade, are given in the tables below.

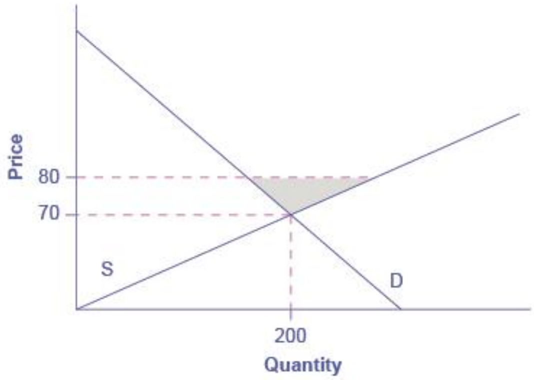
Pepperland		
Price	**Qd**	**Qs**
60	230	180
70	200	200
80	170	220
90	150	240
100	140	250

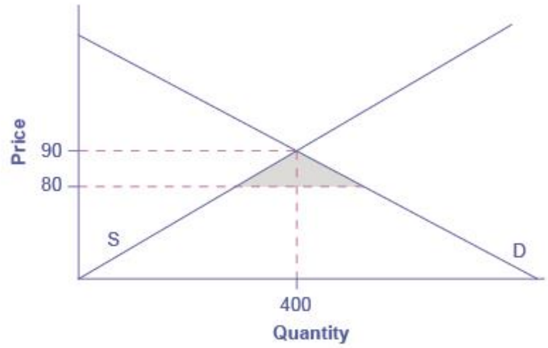
Land of Submarines		
Price	**Qd**	**Qs**
60	430	310
70	420	330
80	410	360
90	400	400
100	390	440

a. **What would be the equilibrium price and quantity in each country in a world without trade? How can you tell?**
b. **What would be the equilibrium price and quantity in each country if trade is allowed to occur? How can you tell?**
c. **Sketch two supply and demand diagrams, one for each country, in the situation before trade.**
d. **On those diagrams, show the equilibrium price and the levels of exports and imports in the world after trade.**
e. **If the Land of Submarines imposes an anti-dumping import quota of 30, explain in general terms whether it will benefit or injure consumers and producers in each country.**
f. **Does your general answer change if the Land of Submarines imposes an import quota of 70?**

Solution

a. The equilibrium price in Pepperland is 70, where quantity demanded equals quantity supplied. In the Land of Submarines, it is 90.
b. The equilibrium price would be 80, where the total quantity demanded across both countries equals the total quantity supplied.
c.





d. Pepperland exports 50 units of steel to the Land of Submarines.
e. The quota will injure consumers in the Land of Submarines by driving the price up, but benefit producers. The reverse is true for Pepperland.
f. The equilibrium level of imports is 50, so a quota of 70 would be non-binding and have no effect.

APPENDIX A

The Use of Mathematics in Principles of Economics

Review Questions

1. Name three kinds of graphs and briefly state when is most appropriate to use each type of graph.

Solution : A line graph is used to show the relationship between two variables; a pie graph is used to show different variables as a proportion of a whole; and a bar graph is used to compare a number of different variables side by side.

2. What is slope on a line graph?

Solution : The slope of a line indicates the magnitude and direction of a relationship between two variables.

3. What do the slices of a pie chart represent?

Solution : Slices in a pie chart represent different portions of the whole, such as different allocations of a budget towards various expenditures.

4. Why is a bar chart the best way to illustrate comparisons?

Solution : A bar chart can show many variables side by side, so it is easy to see the relative values of each in comparison with the others.

5. How does the appearance of positive slope differ from negative slope and from zero slope?

Solution: A line with a positive slope will slant upward from left to right; a line with a negative slope will slant downward; a line with zero slope will be horizontal.

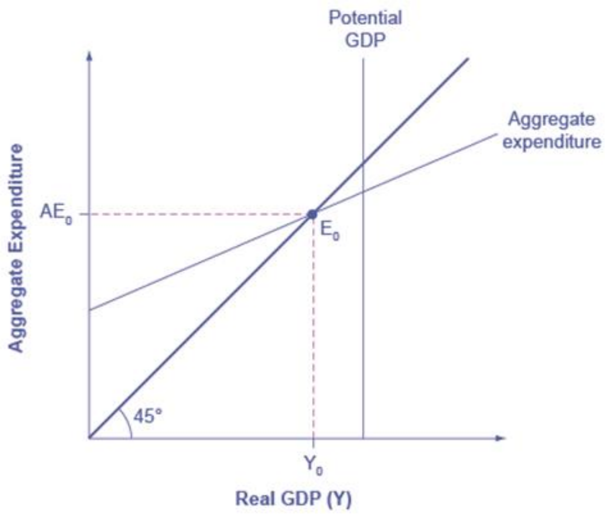
APPENDIX B

The Expenditure-Output Model

Self-Check Questions

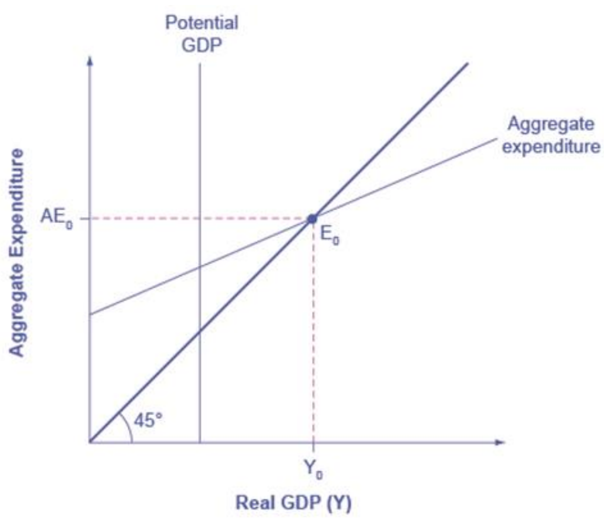
1. Sketch the aggregate expenditure–output diagram with the recessionary gap

Solution:



2. Sketch the aggregate expenditure output diagram with an inflationary gap.

Solution:



3. An economy has the following characteristics:
Y = National income
Taxes = T = 0.25Y
C = Consumption = 400 + 0.85(Y – T)
I = 300
G = 200

X = 500
M = 0.1(Y – T)
Find the equilibrium for this economy. If potential GDP is 3,500, then what change in government spending is needed to achieve this level? Do this problem two ways. First, plug 3,500 into the equations and solve for G. Second, calculate the multiplier and figure it out that way.

Solution: First, set up the calculation.

$$AE = 400 + 0.85(Y - T) + 300 + 200 + 500 - 0.1(Y - T)$$
$$AE = Y$$

Then insert Y for AE and 0.25Y for T.

$$Y = 400 + 0.85(Y - 0.25Y) + 300 + 200 + 500 - 0.1(Y - 0.25Y)$$
$$Y = 1400 + 0.6375Y - 0.075Y$$
$$0.4375Y = 1400$$
$$Y = 3200$$

If full employment is 3,500, then one approach is to plug in 3,500 for Y throughout the equation, but to leave G as a separate variable.

$$Y = 400 + 0.85(Y - 0.25Y) + 300 + G + 500 + 0.1(Y - 0.25Y)$$
$$3500 = 400 + 0.85(3500 - 0.25(3500)) + 300 + G + 500 - 0.1(3500 - 0.25(3500))$$
$$G = 3500 - 400 - 2231.25 - 1300 - 500 + 262.5$$
$$G = 331.25$$

A G value of 331.25 is an increase of 131.25 from its original level of 200.
Alternatively, the multiplier is that, out of every dollar spent, 0.25 goes to taxes, leaving 0.75, and out of after-tax income, 0.15 goes to savings and 0.1 to imports. Because (0.75)(0.15) = 0.1125 and (0.75)(0.1) = 0.075, this means that out of every dollar spent: 1 –0.25 –0.1125 –0.075 = 0.5625. Thus, using the formula, the multiplier is:

$$\frac{1}{1 - 0.5625} = 2.2837$$

To increase equilibrium GDP by 300, it will take a boost of 300/2.2837, which again works out to 131.25.

4. **The chart below represents the data behind a Keynesian cross diagram. Assume that the tax rate is 0.4 of national income; the MPC out of the after-tax income is 0.8; investment is \$2,000; government spending is \$1,000; exports are \$2,000 and imports are 0.05 of after-tax income. What is the equilibrium level of output for this economy?**

National Income	After-tax Income	Consumption	I+G+X	Minus Imports	Aggregate Expenditures
\$8,000		**\$4,340**			
\$9,000					
\$10,000					
\$11,000					
\$12,000					
\$13,000					

Solution: The following table illustrates the completed table. The equilibrium is level is italicized.

National Income	After-tax Income	Consumption	I+G+X	Minus Imports	Aggregate Expenditures
$8,000	$4,800	$4,340	$5,000	$240	$9,100
$9,000	$5,400	$4,820	$5,000	$270	$9,550
$10,000	$6,000	$5,300	$5,000	$300	$10,000
$11,000	*$6,600*	*$5,780*	*$5,000*	*$330*	*$10,450*
$12,000	$7,200	$6,260	$5,000	$360	$10,900
$13,000	$7,800	46,740	$5,000	4390	$11,350

We can solve for Y, where Y = National Income using:
Y=AE= C + I + G + X – M
Y = $500 +0.8(Y-T) + $2,000 + $1,000 + $2,000 – 0.05 (Y – T)
Solving for Y, we see that the equilibrium level of output is Y = $10,000.

5. Explain how the multiplier works. Use an MPC of 80% in an example.

Solution: The multiplier refers to how many times a dollar will turnover in the economy. It is based on the Marginal Propensity to Consume (MPC) which tells how much of every dollar received will be spent. If the MPC is 80% then this means that out of every one dollar received by a consumer, $0.80 will be spent. This $0.80 is received by another person. In turn, 80% of the $0.80 received, or $0.64, will be spent, and so on. The impact of the multiplier is diluted when the effect of taxes and expenditure on imports is considered. To derive the multiplier, take the 1/1 – F; where F is equal to percent of savings, taxes, and expenditures on imports.

Review Questions

6. What is on the axes of an expenditure-output diagram?

Solution: The vertical axis shows the level of aggregate expenditure, while the horizontal axis shows the level of aggregate output.

7. What does the 45-degree line show?

Solution: It shows the set of all points where aggregate expenditure is equal to aggregate output.

8. What determines the slope of a consumption function?

Solution: The marginal propensity to consume.

9. What is the marginal propensity to consume, and how is it related to the marginal propensity to import?

Solution: The marginal propensity to consume is the percentage of each dollar that is spent on consumption. The marginal propensity to import varies inversely with the marginal propensity to consume, since imported goods are not part of domestic consumption.

10. Why are the investment function, the government spending function, and the export function all drawn as flat lines?

Solution: Because these are determined outside of the model, and not by aggregate expenditures.

11. Why does the import function slope down? What is the marginal propensity to import?

Solution: The marginal propensity to import is the share of each dollar that goes towards imported goods. The import function slopes downward because imports are subtracted from aggregate output.

12. What are the components on which the aggregate expenditure function is based?

Solution: Consumption, investment, government spending and net exports.

13. Is the equilibrium in a Keynesian cross diagram usually expected to be at or near potential GDP?

Solution: The equilibrium can occur either above or below potential GDP.

14. What is an inflationary gap? A recessionary gap?

Solution: An inflationary gap is when the equilibrium level of output is greater than potential GDP, causing prices to rise. A recessionary gap is where the equilibrium level of output is less than potential GDP, causing unemployment.

15. What is the multiplier effect?

Solution: The multiplier effect occurs as a portion of each dollar received as income is spent, thus becoming someone else's income, passing from person to person based on the marginal propensity to consume.

16. Why are savings, taxes, and imports referred to as "leakages" in calculating the multiplier effect?

Solution: Every portion of a dollar that is saved, taxed or spent on imports no longer passes on to become part of the domestic product, so these factors weaken the multiplier effect.

17. Will an economy with a high multiplier be more stable or less stable than an economy with a low multiplier in response to changes in the economy or in government policy?

Solution: Economies with high multipliers will be less stable, because small changes in spending can have large effects o the economy as a whole.

18. How do economists use the multiplier?

Solution: The multiplier can be used to estimate how much government expenditure or taxation needs to change in order to achieve an optimal equilibrium at potential GDP and can also be used by economics to estimate the impact of major investments such as a sports stadium.

Critical Thinking Questions

19. What does it mean when the aggregate expenditure line crosses the 45-degree line? In other words, how would you explain the intersection in words?

Solution: The equilibrium point is the point where the total amount being spent is equal to the total amount being produced. Any movement away from equilibrium would be unstable and cause either sellers or buyers to adjust their behavior until equilibrium is once again retained.

20. Which model, the AD/AS or the AE model better explains the relationship between rising price levels and GDP? Why?

Solution: The AD/AS model better explains this relationship because the vertical axis measures the price level directly, so we can see the effects of rising prices on GDP. By contrast, the price level is only implicit in the AE model.

21. What are some reasons that the economy might be in a recession, and what is the appropriate government action to alleviate the recession?

Solution: The economy could be in a recession because of decreases in consumption or increases in saving, decreases in investment, government spending or exports. Rising imports may also lead to a recession as production shifts offshore. The appropriate measure for government is to increase spending and decrease taxes to stimulate expenditures and shift the expenditure upward.

22. What should the government do to relieve inflationary pressures if the aggregate expenditure is greater than potential GDP?

Solution: Decrease government spending and increase taxes.

23. Two countries are in a recession. Country A has an MPC of 0.8 and Country B has an MPC of 0.6. In which country will government spending have the greatest impact?

Solution: The country with the MPC of 0.8 because its citizens are more likely to spend at a faster rate and move the aggregate expenditure upward and toward full employment.

24. Compare two policies: a tax cut on income or an increase in government spending on roads and bridges. What are both the short-term and long-term impacts of such policies on the economy?

Solution: The tax cut will likely have the greater short term impact, because it will more rapidly put money in consumers' pockets, but the spending on roads and bridges will have a greater long term impact because of the gains from improved infrastructure.

25. What role does government play in stabilizing the economy and what are the tradeoffs that must be considered?

Solution: Many people believe that the government should use fiscal and monetary policy to stabilize the economy, while others are more skeptical that such tools can be effective. Tradeoffs include the possibility that government intervention will actually make the economy less stable, and the opportunity cost of using taxpayer money for stabilization policy when it could be used for something else.

26. If there is a recessionary gap of $100 billion, should the government increase spending by $100 billion to close the gap? Why? Why not?

Solution: No. Because of the multiplier effect, spending should be increased by less than $100 billion. Otherwise, an inflationary gap will occur.

27. What other changes in the economy can be evaluated by using the multiplier?

Solution: The other common use of the multiplier occurs when measuring the money supply, as changes in the money supply have a multiplier effect in the same way that spending does.