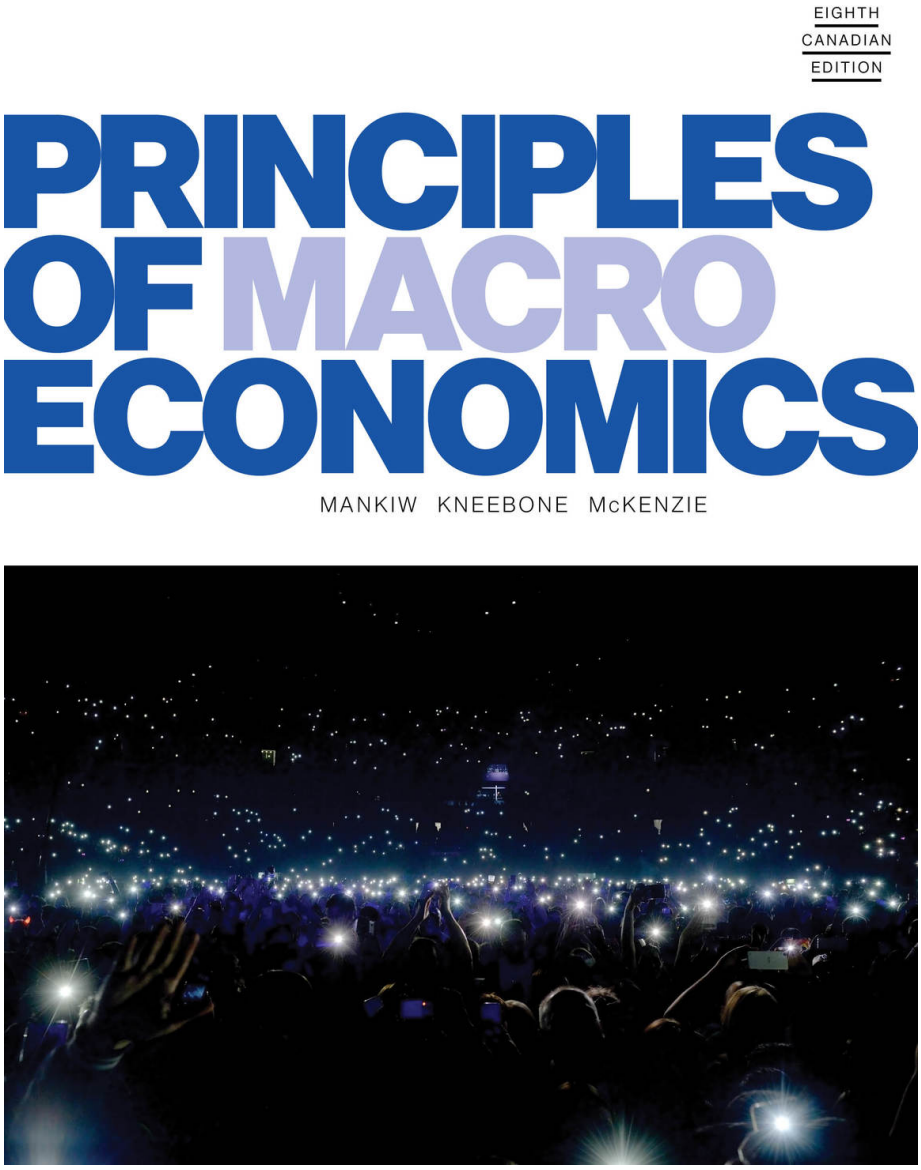
Principles of Macroeconomics (Canadian) 8th edition Mankiw Solutions Manual

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INSTRUCTOR'S SOLUTIONS MANUAL

to accompany



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University of Calgary

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Principles of Macroeconomics (Canadian) 8th edition Mankiw Solutions Manual

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Principles of Macroeconomics, Eighth Canadian Edition
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Chapter 1
Ten Principles of Economics

SOLUTIONS TO TEXTBOOK PROBLEMS

Quick Quizzes

1. *Describe an important tradeoff you recently faced. • Give an example of some action that has both a monetary and nonmonetary opportunity cost. • Describe an incentive your parents and/or guardians offered to you in an effort to influence your behaviour.*

   Usually students are able to come up with standard examples of tradeoffs: buy a textbook instead of a ticket to a favourite performance, go to a group study session instead of a birthday party, etc. Instructors may wish to point out less straightforward instances of how the principles work. For instance, when discussing incentives instructors may point out perverse effects of incentives. Other examples include the invention of the seat belt, or crosswalk countdown signals, discussed in the text. Examples of actions that have both monetary and nonmonetary opportunity costs are watching a movie (time + money) and driving a car (money + pollution + traffic congestion). Parents and/or guardians may offer their children gifts conditional on good results in school.

2. *Why is a country better off not isolating itself from all other countries? • Why do we have markets and, according to economists, what roles should government play in them?*

   A country is better off not isolating itself from other countries for the simple reason that doing so would prevent it from engaging in mutually beneficial trade, which gives consumers access to more diverse and cheaper products.

   Markets are usually a good way of organizing economic activity because they allocate resources to their most efficient use, maximizing the size of the economic pie. This is because market prices convey information about the scarcity of various resources, which provides important signals to consumers and producers when making their decisions.

   A fundamental role of government is to define and enforce property rights for scarce resources, to allow markets to work in an efficient manner. In some cases, however, markets may nonetheless fail to allocate resources in an efficient manner, and governments can intervene to improve market outcomes. This is the case when market failures exist, such as externalities and market power.

   Another role for government can be to address concerns about the equitable distribution of the economic pie. While in the absence of market failures markets will lead to an efficient outcome (maximizing the size of the economic pie), there is no guarantee that the outcome will be equitable (result in a fair distribution of the pie). Governments can therefore play a role in pursuing equity objectives. However, this often requires interventions that may impinge upon efficiency, shrinking the overall size of the economic pie; thus the notion of the efficiency-equity tradeoff.

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3. *List and briefly explain the three principles that describe how the economy as a whole works.*

The three principles that describe how the economy as a whole works are: (1) a country's standard of living depends on its ability to produce goods and services; (2) prices rise when the government prints too much money; and (3) society faces a short-run tradeoff between inflation and unemployment. A country's standard of living depends on its ability to produce goods and services, which in turn depends on its productivity, which is a function of the education of workers and the access workers have to the necessary tools and technology. Prices rise when the government prints too much money because more money in circulation reduces the value of money, causing inflation. Society faces a short-run tradeoff between inflation and unemployment that is only temporary, and policymakers have some ability to exploit this relationship using various policy instruments.

Questions for Review

1. *What is a tradeoff? Give two examples of tradeoffs that you face in your life.*

A tradeoff is what you give up in order to get something else. Examples of tradeoffs include time tradeoffs (such as studying one subject over another, or studying at all compared to engaging in social activities), and spending tradeoffs (such as whether to use your last $15 to purchase a pizza or to buy an online study guide for that tough economics course).

2. *What is the opportunity cost of seeing a movie?*

The opportunity cost of seeing a movie includes the monetary cost of admission plus the time cost of going to the theatre and attending the show. The time cost depends on what else you might do with that time; if it's staying home and watching TV, the time cost may be small, but if it's working an extra three hours at your job, the time cost is the money you could have earned.

3. *Water is necessary for life. Is the marginal benefit of a glass of water large or small?*

The marginal benefit of a glass of water depends on your circumstances. If you've just run a marathon, or you've been walking in the desert sun for three hours, the marginal benefit is very high. But if you've been drinking a lot of liquids recently, the marginal benefit is quite low. The point is that even the necessities of life, like water, don't always have large marginal benefits.

4. *Why should policymakers think about incentives?*

Policymakers need to think about incentives so they can understand how people will respond to the policies they put in place. The text's examples of seat belts and crosswalk countdown signals show that policy actions can have quite unintended consequences. If incentives matter a lot, they may lead to a very different type of policy; for example, some economists have suggested putting knives in steering columns so that people will drive much more carefully! While this suggestion is silly, it highlights the importance of incentives.

5. *Why isn't trade among countries like a game, with some winners and some losers?*

Trade among countries isn't a game with some losers and some winners because trade can make everyone better off. By allowing specialization, trade between people and trade between countries can improve everyone's welfare.

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6. *What does the "invisible hand" of the marketplace do?*

The "invisible hand" of the marketplace represents the idea that even though individuals and firms are all acting in their own self-interest, prices and the marketplace guide them to do what is good for society as a whole.

7. *Explain the two main causes of market failure and give an example of each.*

The two main causes of market failure are externalities and market power. An externality is the impact of one person's actions on the well-being of a bystander, such as from pollution or the creation of knowledge. Market power refers to the ability of a single person (or small group of people) to unduly influence market prices, such as in a town with only one well or only one cable television company.

8. *Why is productivity important?*

Productivity is important because a country's standard of living depends on its ability to produce goods and services. The greater a country's productivity (the amount of goods and services produced from each hour of a worker's time), the greater will be its standard of living.

9. *What is inflation, and what causes it?*

Inflation is an increase in the overall level of prices in the economy. Inflation is caused by increases in the quantity of a nation's money.

10. *How are inflation and unemployment related in the short run?*

Inflation and unemployment are negatively related in the short run. Reducing inflation entails costs to society in the form of higher unemployment in the short run.

Quick Check Multiple Choice

1. *Economics is best defined as the study of which of the following?*
   a. *how society manages its scarce resources*
   b. *how to run a business most profitably*
   c. *how to predict inflation, unemployment, and stock prices*
   d. *how the government can stop the harm from unchecked self-interest*

2. *What is your opportunity cost of going to a movie?*
   a. *the price of the ticket*
   b. *the price of the ticket plus the cost of any soda and popcorn you buy at the theatre*
   c. *the total cash expenditure needed to go to the movie plus the value of your time*
   d. *zero, as long as you enjoy the movie and consider it a worthwhile use of time and money*

3. *Which of the following describes a marginal change?*
   a. *one that is NOT important for public policy*
   b. *one that incrementally alters an existing plan*
   c. *one that makes an outcome inefficient*
   d. *one that does NOT influence incentives*

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4. *What is Adam Smith's "invisible hand"?*
   a. *the subtle and often hidden methods that businesses use to profit at consumers' expense*
   b. *the ability of free markets to reach desirable outcomes despite the self-interest of market participants*
   c. *the ability of government regulation to benefit consumers even if the consumers are unaware of the regulations*
   d. *the way in which producers or consumers in unregulated markets impose costs on innocent bystanders*

5. *When policymakers make policies that change the costs and benefits that people face, what is the result for society?*
   a. *people's behaviours are altered*
   b. *people ignore incentives*
   c. *inflation occurs*
   d. *government revenue is reduced*

6. *If a nation has high and persistent inflation, what is the most likely explanation?*
   a. *the central bank is creating excessive amounts of money*
   b. *unions bargaining for excessively high wages*
   c. *the government is imposing excessive levels of taxation*
   d. *firms are using their monopoly power to enforce excessive price hikes*

1. a
2. c
3. b
4. b
5. a
6. a

Problems and Applications

1. *Describe some of the tradeoffs faced by each of the following.*
   a. a family deciding whether to buy a new car
   b. a member of Parliament deciding how much to spend on national parks
   c. a company president deciding whether to open a new factory
   d. a professor deciding how much to prepare for class

   a. A family deciding whether to buy a new car faces a tradeoff between the cost of the car and other things they might want to buy. For example, buying the car might mean they must give up going on vacation for the next two years. So the real cost of the car is the family's opportunity cost in terms of what they must give up.

   b. For a member of Parliament deciding whether to increase spending on national parks, the tradeoff is between parks and other spending items or tax cuts. If more money goes into the park system, that may mean less spending on national defence or on the police force. Or, instead of spending more money on the park system, taxes could be reduced.

   c. When a company president decides whether to open a new factory, the decision is based on whether the new factory will increase the firm's profits compared to other alternatives. For example, the company could upgrade existing equipment or expand existing factories. The bottom line is: Which method of expanding production will increase profit the most?

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d. In deciding how much to prepare for class, a professor faces a tradeoff between the value of improving the quality of the lecture compared to other things she could do with her time, such as working on additional research.

2. *You are trying to decide whether to take a vacation. Most of the costs of the vacation (airfare, hotel, forgone wages) are measured in dollars, but the benefits of the vacation are psychological. How can you compare the benefits to the costs?*

When the benefits of something are psychological, such as going on a vacation, it isn't easy to compare benefits to costs to determine if it's worth doing. But there are two ways to think about the benefits. One is to compare the vacation with what you would do in its place. If you didn't go on vacation, would you buy something like a new set of golf clubs? Then you can decide if you'd rather have the new clubs or the vacation. A second way is to think about how much work you had to do to earn the money to pay for the vacation; then you can decide if the psychological benefits of the vacation are worth the psychological costs incurred to earn the money to pay for the vacation.

3. *You were planning to spend Saturday working at your part-time job, but a friend asks you to go skiing. What is the true cost of going skiing? Now suppose that you had been planning to spend the day studying at the library. What is the cost of going skiing in this case? Explain.*

If you are thinking of going skiing instead of working at your part-time job, the cost of skiing includes its monetary and time costs, including the opportunity cost of the wages you are giving up by not working. If the choice is between skiing and going to the library to study, then the cost of skiing is its monetary and time costs, including the cost to you of getting a lower grade in your course.

4. *You win $100 in a hockey pool. You have a choice between spending the money now or putting it away for a year in a bank account that pays 5 percent interest. What is the opportunity cost of spending the $100 now?*

If you spend $100 now instead of saving it for a year and earning 5 percent interest, you are giving up the opportunity to spend $105 a year from now. The idea that money has a time value is the basis for the field of finance, the subfield of economics that has to do with prices of financial instruments like stocks and bonds.

5. *The company that you manage has invested $5 million in developing a new product, but the development is not quite finished. At a recent meeting, your salespeople report that the introduction of competing products has reduced the expected sales of your new product to $3 million. If it would cost $1 million to finish development and make the product, should you go ahead and do so? What is the most that you should pay to complete development?*

The fact that you've already sunk $5 million isn't relevant to your decision anymore, since that money is gone. What matters now is the chance to earn profits at the margin. If you spend another $1 million and can generate sales of $3 million, you'll earn $2 million in marginal profit, so you should do so. You're right to think that the project has lost a total of $3 million ($6 million in costs and only $3 million in revenue), and you shouldn't have started it. That's true, but if you don't spend the additional $1 million, you won't have any sales and your losses will be $5 million. So what matters is not the total profit, but the profit you can earn at the margin. In fact, you'd pay up to $3 million to complete development; any more than that and you won't be increasing profit at the margin.

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6. *The welfare system provides income for people who are very poor, with low incomes and few assets. If a recipient of welfare payments decides to work and earn some money, the amount he or she receives in welfare payments is reduced.*
   a. How does this affect the incentive to work?
   b. How does this feature of the welfare system represent the tradeoff between equality and efficiency?

   a. The provision of welfare payments lowers an individual's incentive to work by imposing an implicit tax on labour earnings. For example, if an individual who receives $100 in welfare payments loses 50 percent of those payments for each dollar in extra income earned, this is like a tax on labour earnings, which will discourage work.

   b. By targeting welfare payments at low-income people and reducing payments as their earned income increases, the system is addressing equity concerns. However, this comes at the cost of efficiency due to the decrease in work effort discussed in part a.

7. *Your roommate is a better and faster cook than you are, but you can clean more quickly than your roommate can. If your roommate did all of the cooking and you did all of the cleaning, would your chores take you more or less time than if you divided each task evenly? Give a similar example of how specialization and trade can make two countries both better off.*

   By specializing in each task, you and your roommate can finish the chores more quickly. If you divided each task equally, it would take you more time to cook than it would take your roommate, and it would take him more time to clean than it would take you. By specializing, you reduce the total time spent on chores.

   Similarly, countries can specialize and trade, making both better off. For example, suppose it takes Spanish workers less time to make clothes than French workers, and French workers can make wine more efficiently than Spanish workers. Then Spain and France can both benefit if Spanish workers produce all the clothes and French workers produce all the wine, and they exchange some wine for some clothes.

8. *Nations with corrupt police and court systems typically have lower standards of living than nations with less corruption. Why might that be the case?*

   These activities tend to lessen the efficiency of an economic system, hence reducing the economic productivity of a nation. Lower productivity means lower standards of living.

9. *Explain whether each of the following government activities is motivated by a concern about equity or a concern about efficiency. In the case of efficiency, discuss the type of market failure involved.*
   a. regulating cable TV prices
   b. providing some poor people with free prescription drugs
   c. prohibiting smoking in public places
   d. preventing mergers between major banks
   e. imposing higher personal income tax rates on people with higher incomes
   f. instituting laws against driving while intoxicated

   a. Efficiency: The market failure comes from the market power of a small number of cable TV firms.
   b. Equity

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c. Efficiency: An externality arises because secondhand smoke harms nonsmokers in public places.

d. Efficiency: The market failure comes from the market power that might occur from potential mergers.

e. Equity

f. Efficiency: An externality exists because of accidents caused by drunk drivers.

10. *Discuss each of the following statements from the standpoints of equity and efficiency.*

a. "Everyone in society should be guaranteed the best health care possible."

b. "When workers are laid off, they should be able to collect unemployment benefits until they find a new job."

a. If everyone were guaranteed the best health care possible, much more of our nation's output would be devoted to health care than is now the case. Would that be efficient? If you believe that doctors have market power and restrict health care to keep their incomes high, you might think efficiency would increase by providing more health care. But more likely, if the government mandated increased spending on health care, the economy would be less efficient because it would give people more health care than they would choose to pay for. From the point of view of equality, if poor people are less likely to have adequate health care, providing more health care would represent an improvement. Each person would have a more equal slice of the economic pie, though the pie would consist of more health care and fewer other goods.

b. When workers are laid off, equality considerations argue for the unemployment benefits system to provide them with some income until they can find new jobs. After all, no one plans to be laid off, so unemployment benefits are a form of insurance. But there is an efficiency problem—why work if you can get income for doing nothing? The economy is not operating efficiently if people remain unemployed for a long time, and unemployment benefits encourage unemployment. Thus, there is a tradeoff between equality and efficiency. The more generous unemployment benefits are, the less income is lost by an unemployed person, but the more that person is encouraged to remain unemployed. So greater equality reduces efficiency.

11. *In what ways is your standard of living different from that of your parents or grandparents when they were your age? Why have these changes occurred?*

Since average income in Canada has roughly doubled every 35 years, we are likely to have a better standard of living than our parents, and a much better standard of living than our grandparents. This is mainly the result of increased productivity, so that an hour of work produces more goods and services than it used to. Thus, incomes have continuously risen over time, as has the standard of living.

12. *Suppose Canadians decide to save more of their incomes. If banks lend this extra saving to businesses, which use the funds to build new factories, how might this lead to faster growth in productivity? Who do you suppose benefits from the higher productivity? Is society getting a free lunch?*

If Canadians save more and it leads to more spending on factories, there will usually be an increase in production and productivity, since the same number of workers will have more equipment to work with. The benefits from higher productivity will go to both the workers, who will get paid more since they're producing more, and the factory owners, who will get a return on their investments. There is no such thing as a free lunch, however, because when people save more, they are giving up spending. They get higher incomes in the future at the cost of buying fewer goods today.

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Chapter 2
Thinking Like an Economist

SOLUTIONS TO TEXTBOOK PROBLEMS

Quick Quizzes

1. *In what sense is economics like a science? • Draw a production possibilities frontier for a society that produces food and clothing. Show an efficient point, an inefficient point, and an infeasible point. Show the effects of a drought. • Define* microeconomics *and* macroeconomics*.*

   Economics is like a science because economists devise theories, collect data, and analyze the data in an attempt to verify or refute their theories. In other words, economics is based on the scientific method.

   Figure 1 shows the production possibilities frontier for a society that produces food and clothing. Point A is an efficient point (on the frontier), point B is an inefficient point (inside the frontier), and point C is an infeasible point (outside the frontier).

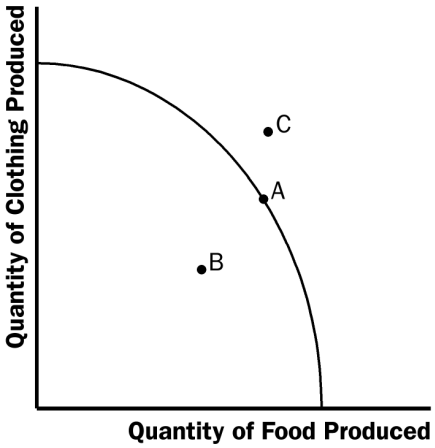


Figure 1

   The effects of a drought are shown in Figure 2. The drought reduces the amount of food that can be produced, shifting the production possibilities frontier inward.

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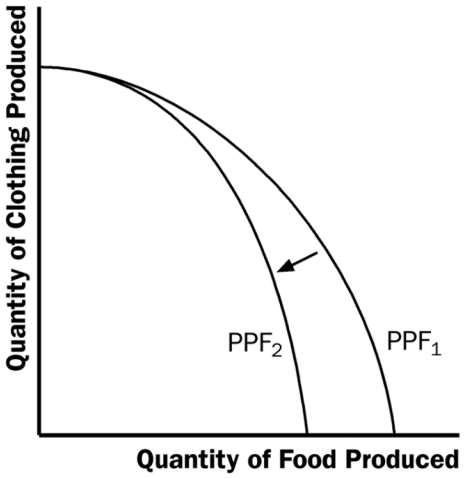


Figure 2

Microeconomics is the study of how households and firms make decisions and how they interact in markets. Macroeconomics is the study of economy-wide phenomena, including inflation, unemployment, and economic growth.

2. *Give an example of a positive statement and an example of a normative statement. • Name three parts of government that regularly rely on advice from economists.*

   An example of a positive statement is "higher taxes discourage work effort" (many other answers are possible). That is a positive statement because it describes the effects of higher taxes, describing the world as it is. An example of a normative statement is "the government should reduce tax rates." That is a normative statement because it is a claim about how the world should be.

   Parts of the government that regularly rely on advice from economists are Finance Canada in designing tax policy, Industry Canada in designing and enforcing Canada's antimonopoly laws, and International Trade Canada in helping to negotiate trade agreements with other countries.

3. *Why might economic advisers to the Prime Minister disagree about a question of policy?*

   Economic advisers to the Prime Minister might disagree about a question of policy because of differing scientific judgments or differences in values.

Questions for Review

1. *In what ways is economics like a science?*

   Economics is like a science because economists use the scientific method. They devise theories, collect data, and then analyze these data in an attempt to verify or refute their theories about how the world works. Economists use theory and observation like other scientists, but they are limited in their ability to run controlled experiments. Instead, they must rely on natural experiments.

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2. *Why do economists make assumptions?*

   Economists make assumptions to simplify problems without substantially affecting the answer. Assumptions can make the world easier to understand.

3. *Should an economic model describe reality exactly?*

   An economic model cannot describe reality exactly because it would be too complicated to understand. A model is a simplification that allows the economist to see what is truly important.

4. *Name a way that your family interacts in the factor market and a way that it interacts in the product market.*

   There are many possible answers.

5. *Name one economic interaction that isn't covered by the simplified circular-flow diagram.*

   There are many possible answers.

6. *Draw and explain a production possibilities frontier for an economy that produces milk and cookies. What happens to this frontier if disease kills half of the economy's cows?*

   Figure 3 shows a production possibilities frontier between milk and cookies (PPF_1). If a disease kills half of the economy's cow population, less milk production is possible, so the PPF shifts inward (PPF_2). Note that if the economy produces all cookies so that it doesn't need any cows, then production is unaffected. But if the economy produces any milk at all, then there will be less production possible after the disease hits.

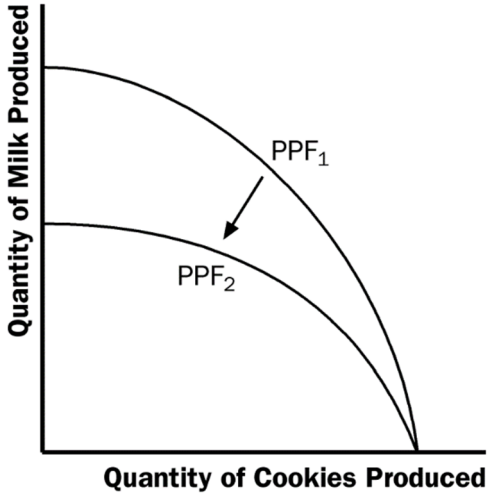


Figure 3

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7. *Use a production possibilities frontier to describe the idea of "efficiency."*

The idea of efficiency is that an outcome is efficient if the economy is getting all it can from the scarce resources it has available. In terms of the production possibilities frontier, an efficient point is a point on the frontier, such as point A in Figure 4. A point inside the frontier, such as point B, is inefficient since more of one good could be produced without reducing the production of another good.

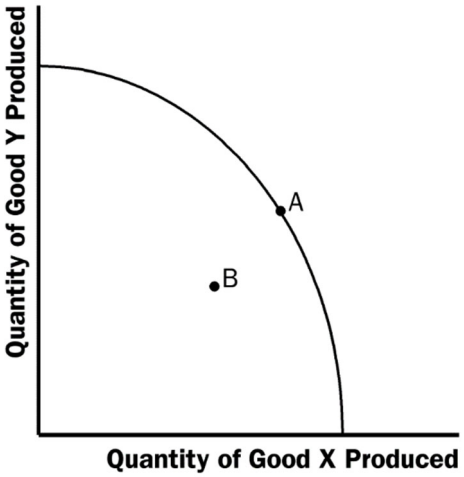


Figure 4

8. *What are the two subfields into which economics is divided? Explain what each subfield studies.*

The two subfields in economics are microeconomics and macroeconomics. Microeconomics is the study of how households and firms make decisions and how they interact in specific markets. Macroeconomics is the study of economy-wide phenomena.

9. *What is the difference between a positive and a normative statement? Give an example of each.*

Positive statements are descriptive and make a claim about how the world is, while normative statements are prescriptive and make a claim about how the world ought to be. Here is an example. Positive: A rapid growth rate of money is the cause of inflation. Normative: The government should keep the growth rate of money low.

10. *Why do economists sometimes offer conflicting advice to policymakers?*

One reason that economists may disagree is that they have different views regarding the validity of alternative positive theories about how the world works or the magnitude of incentive effects. For example, some economists may interpret the evidence regarding the incentive effects of taxes on work effort differently. Another reason that economists may disagree is they have different normative views about what a policy should try to accomplish, most particularly concerning the equity-efficiency tradeoff.

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Quick Check Multiple Choice

1. *What is an economic model?*
   a. *a mechanical machine that replicates the functioning of the economy*
   b. *a fully detailed, realistic description of the economy*
   c. *a simplified representation of some aspect of the economy*
   d. *a computer program that predicts the future of the economy*

2. *What does the circular-flow diagram illustrate in terms of markets for the factors of production?*
   a. *Households are sellers and firms are buyers.*
   b. *Households are buyers and firms are sellers.*
   c. *Households and firms are both buyers.*
   d. *Households and firms are both sellers.*

3. *Is a point inside the production possibilities frontier efficient and feasible?*
   a. *efficient but not feasible*
   b. *feasible but not efficient*
   c. *both efficient and feasible*
   d. *neither efficient nor feasible*

4. *An economy produces hot dogs and hamburgers. If a discovery of the remarkable health benefits of hot dogs were to change consumers' preferences, what would happen?*
   a. *expand the production possibilities frontier*
   b. *contract the production possibilities frontier*
   c. *move the economy along the production possibilities frontier*
   d. *move the economy inside the production possibilities frontier*

5. *Which of the following topics does NOT fall within the study of microeconomics?*
   a. *the impact of cigarette taxes on the smoking behaviour of teenagers*
   b. *the role of Microsoft's market power in the pricing of software*
   c. *the effectiveness of antipoverty programs in reducing homelessness*
   d. *the influence of the government budget deficit on economic growth*

6. *Which of the following is a positive, rather than a normative, statement?*
   a. *Law X will reduce national income.*
   b. *Law X is a good piece of legislation.*
   c. *Parliament ought to pass law X.*
   d. *Law X will change the distribution of income unfairly.*

1. c
2. a
3. b
4. c
5. d
6. a

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Problems and Applications

1. *Draw a circular-flow diagram. Identify the parts of the model that correspond to the flow of goods and services and the flow of dollars for each of the following activities.*
   - *a. Selena pays a storekeeper $2 for a litre of milk.*
   - *b. Stuart earns $15 per hour working at a fast-food restaurant.*
   - *c. Shanna spends $30 to get a haircut.*
   - *d. Salma earns $10 000 from her 10 percent ownership of Acme Industrial.*

   See Figure 5, where the four transactions are shown.

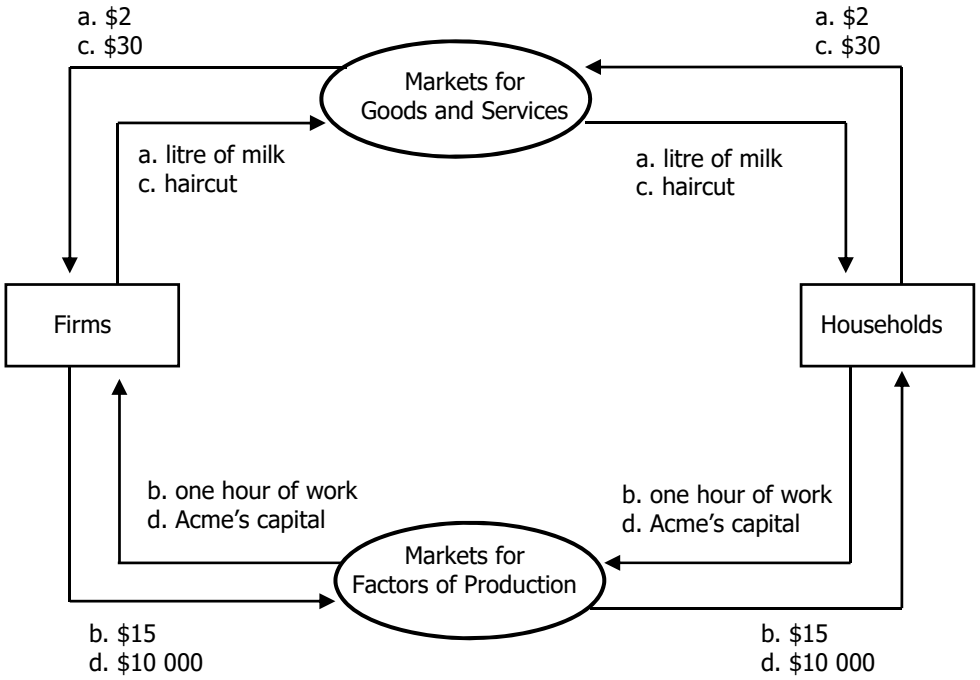


Figure 5

2. *Imagine a society that produces military goods and consumer goods, which we'll call "guns" and "butter."*
   - *a. Draw a production possibilities frontier for guns and butter. Explain why it most likely has a bowed-out shape.*
   - *b. Show a point that is impossible for the economy to achieve. Show a point that is feasible but inefficient.*
   - *c. Imagine that the society has two political parties, called the Hawks (who want a strong military) and the Doves (who want a smaller military). Show a point on your production possibilities frontier that the Hawks might choose and a point the Doves might choose.*
   - *d. Imagine that an aggressive neighbouring country reduces the size of its military. As a result, both the Hawks and the Doves reduce their desired production of guns by the same amount. Which party would get the bigger "peace dividend," measured by the increase in butter production? Explain.*

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a. Figure 6 shows a production possibilities frontier between guns and butter. It is bowed out because when most of the economy's resources are being used to produce butter, the frontier is steep, and when most of the economy's resources are being used to produce guns, the frontier is very flat. When the economy is producing a lot of guns, workers and machines best suited to making butter are being used to make guns, so each unit of guns given up yields a large increase in the production of butter. Thus, the production possibilities frontier is flat. When the economy is producing a lot of butter, workers and machines best suited to making guns are being used to make butter, so each unit of guns given up yields a small increase in the production of butter. Thus, the production possibilities frontier is steep.

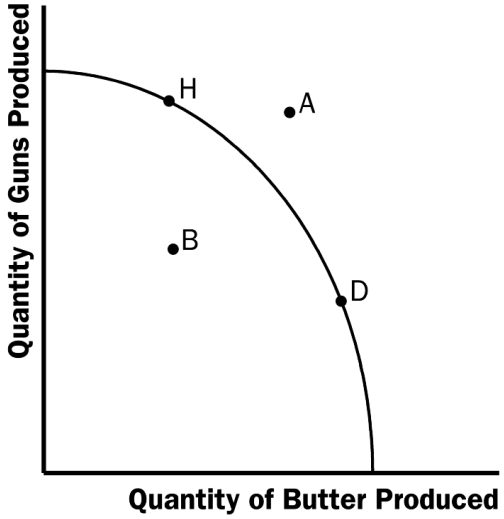


Figure 6

b. Point A is impossible for the economy to achieve; it is outside the production possibilities frontier. Point B is feasible but inefficient because it's inside the production possibilities frontier.

c. The Hawks might choose a point like H, with many guns and not much butter. The Doves might choose a point like D, with a lot of butter and few guns.

d. If both Hawks and Doves reduced their desired quantity of guns by the same amount, the Hawks would get a bigger peace dividend because the production possibilities frontier is much flatter at point H than at point D. As a result, the reduction of a given number of guns, starting at point H, leads to a much larger increase in the quantity of butter produced than when starting at point D.

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3. *The first principle of economics discussed in Chapter 1 is that people face tradeoffs. Use a production possibilities frontier to illustrate society's tradeoff between a clean environment and the quantity of industrial output. What do you suppose determines the shape and position of the frontier? Show what happens to the frontier if engineers develop an automobile engine with almost no emissions.*

See Figure 7. The shape and position of the frontier depend on how costly it is to maintain a clean environment—the productivity of the environmental industry. Gains in environmental productivity, such as the development of a no-emission auto engine, lead to shifts of the production possibilities frontier, like the shift from PPF_1 to PPF_2 shown in the figure.

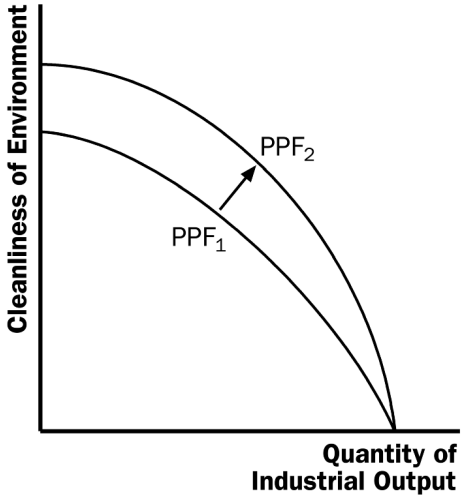


Figure 7

4. *Classify the following topics as relating to microeconomics or macroeconomics.*
   a. a family's decision about how much income to save
   b. the effect of government regulations on auto emissions
   c. the impact of higher national saving on economic growth
   d. a firm's decision about how many workers to hire
   e. the relationship between the inflation rate and changes in the quantity of money

   a. A family's decision about how much income to save is microeconomics.

   b. The effect of government regulations on auto emissions is microeconomics.

   c. The impact of higher national saving on economic growth is macroeconomics.

   d. A firm's decision about how many workers to hire is microeconomics.

   e. The relationship between the inflation rate and changes in the quantity of money is macroeconomics.

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5. *Classify each of the following statements as positive or normative. Explain.*
   a. Society faces a short-run tradeoff between inflation and unemployment.
   b. A reduction in the rate of growth of money will reduce the rate of inflation.
   c. The Bank of Canada should reduce the rate of growth of money.
   d. Society ought to require welfare recipients to look for jobs.
   e. Lower tax rates encourage more work and more saving.

   a. The statement that society faces a short-run tradeoff between inflation and unemployment is a positive statement. It deals with how the economy is, not how it should be. Since economists have examined data and found that there is a short-run negative relationship between inflation and unemployment, the statement is a fact; thus it is a positive statement.

   b. The statement that a reduction in the rate of growth of money will reduce the rate of inflation is a positive statement. Economists have found that money growth and inflation are very closely related. The statement thus tells how the world is, and so it is a positive statement.

   c. The statement that the Bank of Canada should reduce the rate of growth of money is a normative statement. It states an opinion about something that should be done, not how the world is.

   d. The statement that society ought to require welfare recipients to look for jobs is a normative statement. It doesn't state a fact about how the world is. Instead, it is a statement of how the world should be and is thus a normative statement.

   e. The statement that lower tax rates encourage more work and more saving is a positive statement. Economists have studied the relationship between tax rates and work, as well as the relationship between tax rates and saving. They have found a negative relationship in both cases. The statement reflects how the world is, and is thus a positive statement.

6. *If you were Prime Minister, would you be more interested in your economic advisers' positive views or their normative views? Why?*

   As the Prime Minister, you'd be interested in both the positive and normative views of economists, but you'd probably be *most* interested in their positive views. Economists are on your staff to provide their expertise about how the economy works. They know many facts about the economy and the interaction of different sectors. So you would be most likely to call on them about questions of fact—positive analysis. Since you are the Prime Minister, you are the one who has to make the normative statements as to what should be done, with an eye to the political consequences. The normative statements made by economists represent their own views, not necessarily your views or the electorate's views.

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7. *An economy consists of three workers: Larry, Moe, and Curly. Each works for ten hours per day and can produce two services: mowing lawns and washing cars. In an hour, Larry can either mow one lawn or wash one car, Moe can either mow one lawn or wash two cars, and Curly can either mow two lawns or wash one car.*

   a. Calculate how much of each service is produced under the following circumstances, which we label A, B, C, and D:
      - *All three spend all their time mowing lawns. (A)*
      - *All three spend all their time washing cars. (B)*
      - *All three spend half their time on each activity. (C)*
      - *Larry spends half his time on each activity, while Moe only washes cars and Curly only mows lawns. (D)*

   b. Graph the production possibilities frontier for this economy. Using your answers to part (a), identify points A, B, C, and D on your graph.

   c. Explain why the production possibilities frontier has the shape it does.

   d. Are any of the allocations calculated in part (a) inefficient? Explain.

a. The following table gives the outcomes in the four cases. For example, when each uses half their time in each sector, Larry washes 5 cars and mows 5 lawns in 10 hours, etc.

	A	**B**	**C**	**D**
Lawn mowing	40	0	20	25
Car washing	0	40	20	25

b. The following graph shows the production possibilities frontier based on the numbers in the table.

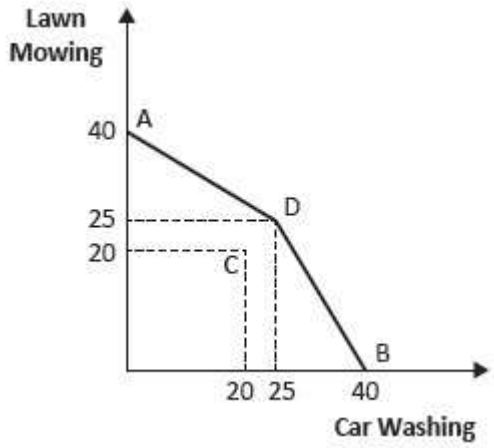


Figure 8

c. The upper part is flatter because the opportunity cost of increasing the number of cars from 0 to 25 is less than 1 lawn per car; moving from 0 cars takes advantage of Moe's better ability to wash cars than to mow lawns. However, when the number of cars exceeds 25, we start losing Curly's better skill in mowing lawns; therefore, the opportunity cost of an extra car increases above 1 forgone mowed lawn per extra washed car.

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d. Allocation C is inefficient. Although all workers use all their time, they do not use their specific skills wisely.

Appendix Problems and Applications

A1. *Consider the linear demand curve:*

$$Q^D = 56 - 4P$$

a. Determine the x- *and* y*-intercepts of this demand curve.*
b. Determine the slope of this demand curve.

a. To determine the *x*-intercept, set $P = 0$ and solve for Q^D, giving $Q^D = 56$; so the *x*-intercept is 56. To determine the *y*-intercept, set $Q^D = 0$ and solve for P, giving $0 = 56 - 4P$, $P = 56/4$, $P = 14$.

b. The slope is the rise over the run, where "rise" is the *y*-intercept and "run" is the *x*-intercept. Thus, slope = –14/56 = –1/4.

A2. *Using the general functional form for a linear demand curve,* $Q^D = a - bP$*, and the data in Table 2A.1,*
a. Determine the values for a *and* b *for Emma when her income is $30 000.*
b. Determine the x- *and* y*-intercepts of this demand curve.*
c. Determine the slope of this demand curve.
d. Draw it on a diagram along with the demand curves when her income is $40 000 and $50 000, identifying the x- *and* y*-intercepts in each case.*

a. At $P = 10$, $Q = 2$ and at $P = 9$, $Q = 6$. Therefore,
$2 = a - 10b$
$6 = a - 9b$
Solve simultaneously for a and b: the first equation gives $a = 2 + 10b$; substitute into the second equation to get $6 = 2 + 10b - 9b$, and solve for $b = 4$; therefore $a = 2 + (10)(4) = 42$. Thus, $Q^D = 42 - 4P$.

b. *x*-intercept = 42, *y*-intercept = 10.5

c. slope = –10.5/42 = –1/4

d.

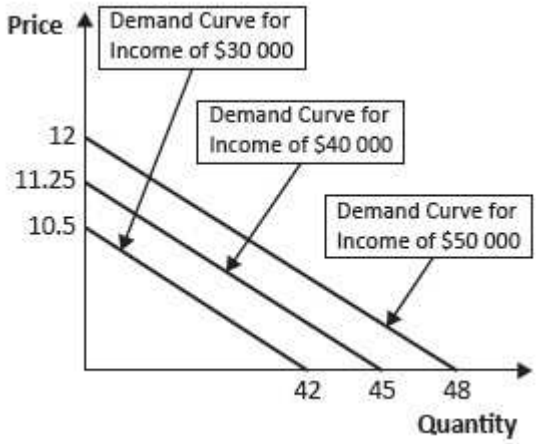


Figure 9

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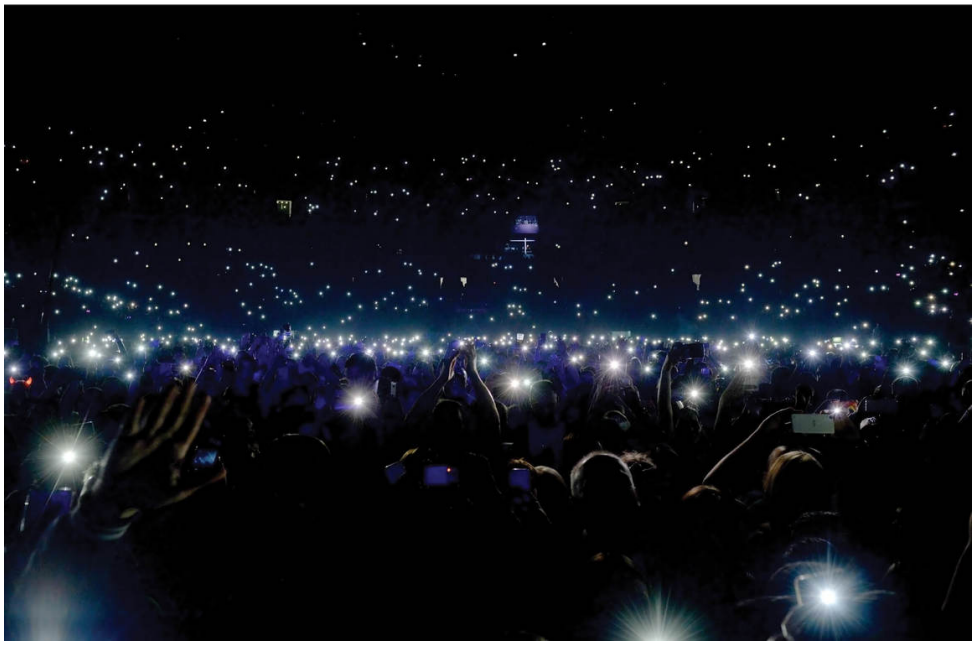
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Enriched

INSTRUCTOR'S MANUAL

to accompany





Prepared by Michel Mayer and Philippe Ghayad
Dawson College

NELSON

Principles of Macroeconomics (Canadian) 8th edition Mankiw Solutions Manual

NELSON

Principles of Macroeconomics, Eighth Canadian Edition
by N. Gregory Mankiw, Ronald D. Kneebone, and Kenneth J. McKenzie

Enriched Instructor's Manual by Michel Mayer and Philippe Ghayad
Copyeditor: Linda Szostak

Tanya Noel, Tamara Kelly, and Julie Clark of York University developed the pedagogical model for Nelson Education's Enriched Instructor's Manual.

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PREFACE to the Enriched Instructor's Manual to accompany *Principles of Macroeconomics*, Eighth Canadian Edition

About NETA

The Nelson Education Teaching Advantage (NETA) program delivers research-based instructor's resources that promote student engagement and higher-order thinking to enable the success of Canadian students and educators.

Instructors today face many challenges. Resources are limited, time is scarce, and a new kind of student has emerged: one who is juggling school with work, has gaps in his or her basic knowledge, and is immersed in technology in a way that has led to a completely new style of learning. In response, Nelson Education has gathered a group of dedicated instructors to advise us on the creation of richer and more flexible ancillaries and online learning platforms that respond to the needs of today's teaching environments. Whether your course is offered in class, online, or both, Nelson is pleased to provide pedagogically driven, research-based resources to support you.

In consultation with our editorial advisory board, Nelson Education has completely rethought the structure, approaches, and formats of our key textbook ancillaries and online learning platforms. We've also increased our investment in editorial support for our ancillary and digital authors. The result is the Nelson Education Teaching Advantage and its key components: *NETA Engagement, NETA Assessment, NETA Presentation,* and *NETA Digital.* Each component includes one or more ancillaries prepared according to our best practices and may also be accompanied by documentation explaining the theory behind the practices.

The **Enriched Instructor's Manual** for *Principles of Macroeconomics* was prepared under the ***NETA Engagement*** program. *NETA Engagement* presents materials that help instructors deliver engaging content and activities to their classes. Instead of instructor's manuals that regurgitate chapter outlines and key terms from the text, NETA *Enriched Instructor's Manuals* (EIMs) provide genuine assistance to teachers. The EIMs address important topics, such as *Why is this chapter important to students?* and *If nothing else, my students should learn….* EIMs not only identify the topics that cause students the most difficulty, but also describe techniques and resources to help students master these concepts. Dr. Roger Fisher's *Instructor's Guide to Classroom Engagement* (IGCE) accompanies every *Enriched Instructor's Manual*.

The Enriched Instructor's Manual for *Principles of Macroeconomics*

Prepared by Michel Mayer and Philippe Ghayad, Dawson College, this is NOT a typical instructor's manual. This Manual may be used as a toolbox for instructors to use to select tactics and strategies that are most appropriate for their teaching style. Each chapter provides instructors with a list of new and updated items in the new edition text, key goals, learning objectives, troublesome concepts, and suggested teaching methods for different approaches, and suggested activities. The structure of each Enriched Instructor's Manual chapter includes:

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What's New in the Eighth Edition? This section highlights changes and updates in the new Canadian Edition text.

Learning Objectives In many cases, instructors may not wish to include all topics within a particular chapter, and thus would only be interested in a subset of the provided learning objectives. We have attempted to be comprehensive, and include learning objectives that reflect chapter content.

Why Is This Chapter Important to Students? A brief synopsis of the chapter with relevance to students in mind.

If Nothing Else, My Students Should Learn… In some cases, instructors will have limited time to devote to a chapter, and may need to prioritize based on the most important concepts.

What Can I Do in Class? Strategies for effective teaching/learning environments, suggested approaches to teaching, suggested engagement activities, and tips for discussions are provided within the chapter outline.

The Instructor's Guide to Classroom Engagement accompanies this *Enriched Instructor's Manual.* This guide provides instructors with an overview of the theory and models of active learning. The *Instructor's Guide to Classroom Engagement* is downloadable from the text's instructor resource site.

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1 TEN PRINCIPLES OF ECONOMICS

WHAT'S NEW IN THE EIGHTH EDITION?

Two new *Case Study* features have been added to Chapter 1. The first, "Ready, Set, Go …," looks at how people respond to incentives, using the example of auto safety. The second, "Adam Smith Would Have Loved Uber," looks at how markets organize economic activity, using Uber as an example.

LEARNING OBJECTIVES

By the end of this chapter, students should understand:

- that economics is about the allocation of scarce resources.
- that individuals face tradeoffs.
- the meaning of *opportunity cost.*
- how to use marginal reasoning when making decisions.
- how incentives affect people's behaviour.
- why trade among people or nations can be good for everyone.
- why markets are a good, but not perfect, way to allocate resources.
- what determines some trends in the overall economy.

WHY IS THIS CHAPTER IMPORTANT TO STUDENTS?

Chapter 1 is the first chapter in a three-chapter section that serves as the introduction to the text. Chapter 1 introduces ten fundamental principles on which the study of economics is based. In a broad sense, the rest of the text is an elaboration on these ten principles. Chapter 2 explains how economists approach problems while Chapter 3 shows how individuals and countries gain from trade.

The purpose of Chapter 1 is to lay out ten economic principles that will serve as building blocks for the rest of the text. The ten principles can be grouped into three categories: how people make decisions, how people interact, and how the economy as a whole works. These ten principles are referred to often throughout the text.

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IF NOTHING ELSE, MY STUDENTS SHOULD LEARN…

1. The fundamental lessons about individual decision making are that people face tradeoffs among alternative goals, that the cost of any action is measured in terms of forgone opportunities, that rational people make decisions by comparing marginal costs and marginal benefits, and that people change their behaviour in response to the incentives they face.

2. The fundamental lessons about interactions among people are that trade can be mutually beneficial, that markets are usually a good way of coordinating trades among people, and that the government can potentially improve market outcomes if there is some sort of market failure or if the market outcome is inequitable.

3. The fundamental lessons about the economy as a whole are that productivity is the ultimate source of living standards, that money growth is the ultimate source of inflation, and that society faces a short-run tradeoff between inflation and unemployment.

WHAT CAN I DO IN CLASS?

I. Introduction



Begin by pointing out that economics is a subject that students must confront in their everyday lives. Point out that they already spend a great deal of their time thinking about economic issues: prices, buying decisions, use of their time, etc.

A. The word "economy" comes from the Greek word meaning "one who manages a household."

B. This makes some sense since in the economy we are faced with many decisions (just as a household is).

C. Fundamental economic problem: resources are scarce.



You will want to start the semester by explaining to students that part of learning economics is to understand new vocabulary. Economists generally use very precise (and sometimes different) definitions for words that are commonly used outside of the economics discipline. Therefore, it will be helpful to students if you follow the definitions provided in the text as much as possible.

D. Definition of **scarcity: the limited nature of society's resources.**

E. Definition of **economics: the study of how society manages its scarce resources.**



Because most first-year students have limited experiences with viewing the world from a cause-and-effect perspective, do not underestimate how challenging these principles will be for the student.

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As you discuss the ten principles, make sure that students realize it is okay if they do not grasp each of the concepts completely or find each of the arguments fully convincing. These ideas will be explored more completely throughout the text.

II. How People Make Decisions

A. Principle #1: People Face Tradeoffs

1. "There is no such thing as a free lunch." Making decisions requires trading off one goal against another.

2. Examples include how a student spends her time, how a family decides to spend its income, how the Canadian government spends tax dollars, how regulations may protect the environment at a cost to firm owners.

3. A special example of a tradeoff is the tradeoff between efficiency and equity.

   a. Definition of **efficiency: the property of society getting the most it can from its scarce resources.**

   b. Definition of **equity: the property of distributing economic prosperity fairly among the members of society.**

   c. For example, tax dollars paid by wealthy Canadians and then distributed to those less fortunate may improve equity but lower the return to hard work and therefore reduce the level of output produced by our resources.

   d. This implies that the cost of this increased equity is a reduction in the efficient use of our resources.

4. Recognizing that tradeoffs exist does not indicate what decisions should be made.

   a. People are likely to make good decisions only if they understand the options that they have available.

B. Principle #2: The Cost of Something Is What You Give Up to Get It

1. Making decisions requires individuals to consider the benefits and costs of some action. However, the cost of an action is not always as obvious as it might appear.

2. What are the costs of going to college or university?

   a. We cannot count room and board (at least all of the cost) because the person would have to pay for food and shelter even if he or she were not in school.

   b. We would want to count the value of the student's time since he could be working for pay instead of attending classes and studying.

3. Definition of **opportunity cost: whatever must be given up to obtain some item**.

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4. Example: Looking at the opportunity cost of taking a day off to watch *Game of Thrones* in terms of lost wages
   a. Assuming an average hourly wage of $28 and a 6-hour workday, the opportunity cost of taking the day off to watch *Game of Thrones* is $168 in lost wages.

   b. Instead of looking at it in terms of wages, you could use any good lost as a point of reference. For instance, if a cup of coffee costs $1.75, then the opportunity cost of watching *Game of Thrones* could be seen as 96 cups of coffee (the amount of cups of coffee that could have been bought with the $168).

C. Principle #3: Rational People Think at the Margin



One of the hardest ideas for students to grasp is that "free" things are not truly free. Thus, you will need to provide students with numerous examples of such "free" things with hidden costs, especially the value of time.

1. Many decisions in life involve incremental decisions: Should I remain in school this semester? Should I take another course this semester? Should I study an additional hour for tomorrow's exam? Rational people often make decisions by comparing marginal benefits and marginal costs.

2. Definition of **rational people: those who systematically and purposefully do the best they can to achieve their objectives.**

3. Definition of **marginal changes: small incremental adjustments to a plan of action.**

4. Example: Suppose that flying a 200-seat plane across the country costs the airline $100 000, which means that the average cost of each seat is $500. Suppose that the plane is minutes from departure and a passenger is willing to pay $300 for a seat. Should the airline sell the seat for $300? In this case, the marginal cost of an additional passenger is very small (the cost of the bag of peanuts and can of soda the extra passenger will consume). Therefore, as long as the passenger pays more than the marginal cost, selling him a ticket is profitable.

5. Marginal decision making can help explain puzzling economic phenomena.

   a. Why is water so cheap while diamonds are so expensive?

   b. The reason is that a person's willingness to pay for any good is based on the marginal benefit that an extra unit of the good would yield. The marginal benefit, in turn, depends on how many units a person already has.

6. A rational decision maker takes an action if and only if the marginal benefit of the action exceeds the marginal cost.

D. Principle #4: People Respond to Incentives

1. Definition of **incentive: something that induces a person to act.**

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2. Because rational people make decisions by weighing costs and benefits, they respond to incentives. Incentives are crucial in analyzing how markets work.

    a. When the price of a good rises, consumers will buy less of it because its cost has risen.

    b. When the price of a good rises, producers will allocate more resources to the production of the good because the benefit from producing the good has risen.

3. Sometimes policymakers fail to understand how policies may alter incentives and behaviour.

4. Example: Seat belt laws increase use of seat belts and lower the incentives of individuals to drive safely. This leads to an increase in the number of car accidents. This also leads to an increased risk for pedestrians.

5. In the News: "Even Criminals Respond to Incentives"

    a. Crime rates have been falling all around the industrialized world, but why?

    b. Thieves are simply responding to market signals where the payoffs from theft are much lower than they use to be. For example, fewer people carry cash in their wallets today.

    c. However, cybercrimes and identity theft are on the rise.



If you include any incentive-based criteria on your syllabus, discuss it now. If you reward class attendance (or penalize students who do not attend class), explain to students how this change in the marginal benefit of attending class can be expected to alter their behaviour.

III. How People Interact

A. Principle #5: Trade Can Make Everyone Better Off

1. Trade is not like a sports contest, where one side gains and the other side loses.

2. Consider trade that affects your family. Certainly the family is involved in trade with other families on a daily basis. Each family in an economy competes with all other families. Most families do not build their own homes, make their own clothes, or grow their own food.

3. Just like families benefit from trading with one another, so do countries.

4. This occurs because it allows for specialization in areas that countries (or families) can do best.

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Activity 1—Getting Dressed in the Global Economy

Type:	In-class assignment
Topics:	Specialization, interdependence, self-interest, consumer choice, international trade
Materials needed:	None
Time:	20 minutes
Class limitations:	Works in any class size

Purpose

The advantages of specialization and division of labour are very clear in this example. The worldwide links of the modern economy are also illustrated. We depend on thousands of people we don't know, won't see, and don't think of in order to get dressed each morning. Self-interest follows naturally from interdependence. Wages, profits, and rents give people the incentive to perform these varied tasks. We depend on them to clothe us and they depend on our purchases for their incomes.

Instructions

Ask the class to answer the following questions. Give them time to write an answer to each question, then discuss their answers before moving on to the next question. The first question can be answered with a brief phrase. The second question is the core of the assignment and takes several minutes. Ask them to list as many categories of workers as possible. The third question introduces demand concepts; most of the determinants of demand can be introduced during this discussion. For the fourth question, ask the class to look at the country-of-origin tags sewn in their garments.

1. Where did your clothes come from?
2. Who worked to produce your clothes?
3. What things do you consider when buying a garment?
4. Where were your clothes produced (what countries)?

Common Answers and Points for Discussion

1. Where did your clothes come from?

There are many possible ways to answer, but many students will say "the mall" or another retail outlet. Some may say "a factory," "a sweatshop," or "a foreign country."

Mention the importance of markets here (this can be emphasized by asking "Is anyone wearing something made by themselves, a friend, or a relative?") and discuss distribution versus production.

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2. Who worked to produce your clothes?

There is no end to the possible answers; garment and textile workers are obvious but most students will also list workers dealing with raw materials, transportation, management, design, or machinery. Some may think more broadly to investors, road crews, bankers, engineers, or accountants.

3. What things do you consider when buying a garment?

Most answers focus on preferences (fit, style, quality, colour). Price is cited less frequently. Ask about the importance of price until someone volunteers that income is important. Prices of substitute goods should also be discussed. Expectations of price changes may also be mentioned. Few students mention complementary goods and most students reject the idea of choosing a sweater to match a particular outfit.

4. Where were your clothes produced (what countries)?

A large number of countries will be represented, even in small classes. Students are usually surprised to find how many garments are domestically produced. Asia is always well represented. Latin American and European goods appear in smaller numbers. African products are conspicuously absent.

This pattern shows the limits of simple explanations such as "cheap labour." Briefly discuss the importance of comparative advantage and specialization.

B. Principle #6: Markets Are Usually a Good Way to Organize Economic Activity

1. Most countries that once had centrally planned economies have abandoned this system and are trying to develop market economies.

2. Definition of **market economy: an economy that allocates resources through the decentralized decisions of many firms and households as they interact in markets for goods and services.**

3. Prices and self-interest guide the decision-making process in the marketplace. Market prices reflect both the value of a product to consumers and the cost of the resources used to produce it. Therefore, decisions to buy or produce goods and services are made based on the cost to society of providing them.



Explain to students that when households and firms do what is best for themselves, they often end up doing what is best for society, as if guided by market forces—or an invisible hand. Spend some time and emphasize the magic of the market. Use numerous examples to show students that the market most often allocates resources to their highest valued use.

4. When a government interferes in a market and restricts prices from adjusting naturally, such as with the use of taxes, decisions that households and firms make are not based on the proper information. Thus, these decisions may be inefficient.

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5. Centrally planned economies failed because they did not allow the market to work. Prices were dictated by central planners as opposed to being determined in the marketplace.

6. Case Study: Adam Smith Would Have Loved Uber

   a. In most major cities, the taxi industry is highly regulated, resembling a centrally planned economy more than a market economy.

   b. Recently, the introduction of Uber has changed the market, as Uber works primarily as a market economy with little intervention from the government and where prices can respond to changes in demand.

   c. The increased competition and market environment brought in by Uber have led to an increase in consumer well-being.

C. Principle #7: Governments Can Sometimes Improve Market Outcomes

1. Markets work only if property rights are enforced.

   a. Definition of **property rights: the ability of an individual to own and exercise control over scarce resources.**

2. Two broad reasons push governments to intervene: to promote efficiency and to promote equity. Government policy can be most useful when there is market failure.

   a. Definition of **market failure: a situation in which a market left on its own fails to allocate resources efficiently.**

3. Examples of market failure.

   a. Definition of **externality: the impact of one person's actions on the well-being of a bystander.** (A classic example being pollution.)

   b. Definition of **market power: the ability of a single economic actor (or small group of actors) to have a substantial influence on market prices.**

   c. Because a market economy rewards people for their ability to produce things that other people are willing to pay for, there will be an unequal distribution of economic prosperity.

4. Note that the principle states that the government can improve market outcomes. This is not saying that the government always does improve market outcomes.

IV. How the Economy as a Whole Works

A. Principle #8: A Country's Standard of Living Depends on Its Ability to Produce Goods and Services

1. Differences in living standards from one country to another are staggering.

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2. Changes in living standards over time are also large.

3. The explanation for differences in living standards lies in differences in productivity.

4. Definition of **productivity: the quantity of goods and services produced from each hour of a worker's time.**

5. High productivity implies a high standard of living and low productivity leads to a lower standard of living.

6. The growth rate of a nation's productivity determines the growth rate of its average income.

7. Thus, policymakers must understand the impact of any policy on our ability to produce goods and services and must therefore strive to ensure workers are well educated, have the proper tools and the best available technology.

B. Principle #9: Prices Rise When the Government Prints Too Much Money

1. Definition of **inflation: an increase in the overall level of prices in the economy.**

2. Because high inflation imposes various costs on society, keeping inflation at a low level is a goal of economic policymakers around the world.

3. When the government creates a large amount of money, the value of money falls.

4. Examples: Germany after World War I (in the early 1920s), and Canada in the 1970s.

C. Principle #10: Society Faces a Short-Run Tradeoff between Inflation and Unemployment

1. The short-run effects of monetary injection:

   a. Increasing the amount of money in the economy stimulates the overall level of spending and thus the demand for goods and services.

   b. Higher demand may over time cause firms to raise their prices, but it also encourages them to increase the quantity of goods and services they produce and to hire more workers to produce those goods and services.

   c. More hiring means lower unemployment.

2. Some economists still question these ideas, but most accept that society faces a short-run tradeoff between inflation and unemployment.

3. Over a short period of time, economic policies push inflation and unemployment in opposite directions.

4. The policymakers face this tradeoff regardless of whether inflation and unemployment both start out at high or low levels.

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5. The short-run tradeoff between inflation and unemployment is important for understanding the business cycle.

6. Definition of **business cycle: fluctuations in economic activity, such as employment and production.**

7. Policymakers can exploit this short-run tradeoff by using various policy instruments, but the extent and desirability of these interventions is of continuing debate.

8. This debate heated up in 2008 and 2009 when the Canadian economy, as well as many other economies around the world, experienced a deep economic downturn.

Activity 2—So Many Things to Do, So Little Time

Type:	In-class assignment
Topics:	Tradeoffs, opportunity cost, thinking at the margin, incentives
Materials needed:	None
Time:	10 minutes
Class limitations:	Works in any class size

Give students a list of activities with corresponding time requirements: sleep, 8 hours; sleep, 6 hours; eat breakfast, 30 minutes; ride a bike, 1 hour; go hiking, 2 hours; study, 3 hours; study, 2 hours; go to class, 4 hours; go to class, 6 hours; watch TV, 2 hours; watch TV, 6 hours; take a nap, 1 hour; work, 8 hours; work, 4 hours; etc.

Make sure that there are many choices and that there are many pleasurable experiences—too much for a 24-hour period.

Ask students which Principle of Economics this illustrates.

If they do not say 1, 2, 3, and 4, help them see that this exercise has tradeoffs in the choices they make, that each choice has an opportunity cost, that deciding whether or not to sleep 4 more hours may depend on whether you have already slept for 6, and that choices may be influenced by the incentives the student faces. For example, a student who is about to be placed on academic probation has an incentive to study harder.

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2 THINKING LIKE AN ECONOMIST

WHAT'S NEW IN THE EIGHTH EDITION?

In Chapter 2, an explanation of the *Ask the Experts* boxes included in this edition appears beside the first box, "Ticket Resale," which concerns the resale of entertainment tickets. One question has been added in the Question for Review section. A reference back to a case study in Chapter 1 explains the possible effects of omitted variables.

LEARNING OBJECTIVES

By the end of this chapter, students should understand:

- how economists apply the methods of science.
- how assumptions and models can shed light on the world.
- two simple models—the circular flow and the production possibilities frontier.
- the difference between microeconomics and macroeconomics.
- the difference between positive and normative statements.
- the role of economists in making policy.
- why economists sometimes disagree with one another.
- how to graph variables and interpret data (in Appendix).

WHY IS THIS CHAPTER IMPORTANT TO STUDENTS?

Chapter 2 is the second chapter in a three-chapter section that serves as the introduction of the text. Chapter 1 introduced ten principles of economics that will be revisited throughout the text. Chapter 2 develops how economists approach problems, while Chapter 3 will explain how individuals and countries gain from trade.

The purpose of Chapter 2 is to familiarize students with how economists approach economic problems. With practice, students will learn how to approach similar problems in this dispassionate systematic way. They will see how economists employ the scientific method, the role of assumptions in model building, and the application of two specific economic models. Students will also learn the important distinction between two roles economists can play: as scientists when we try to explain the

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economic world, and as policymakers when we try to improve it. In the Appendix, students will learn how to graph variables and functions, and properly interpret data.

IF NOTHING ELSE, MY STUDENTS SHOULD LEARN…

1. Economists try to address their subject with a scientist's objectivity. Like all scientists, they collect and analyze data, they make appropriate assumptions and build simplified models in order to understand the world around them. Two simple economic models are the circular-flow diagram and the production possibilities frontier.

2. The field of economics is divided into two subfields: microeconomics and macroeconomics. Microeconomists study decision making by households and firms and the interaction among households and firms in the marketplace. Macroeconomists study the forces and trends that affect the economy as a whole.

3. A positive statement is an assertion about how the world *is*. A normative statement is an assertion about how the world *ought to be*. When economists make normative statements, they are acting more as policy advisers than scientists.

4. Economists who advise policymakers offer conflicting advice either because of differences in scientific judgments or because of differences in values. At other times, economists are united in the advice they offer, but policymakers may choose to ignore it.

WHAT CAN I DO IN CLASS?

I. The Economist as Scientist

A. The Scientific Method: Observation, Theory, and More Observation

1. Observations help us to develop theory.

2. Data can be collected and analyzed to evaluate theories.

3. Unlike other sciences, conducting experiments in economics is often impractical.

4. Using data to evaluate theories is more difficult in economics than in physical science because economists are unable to generate their own data and must make do with whatever data are available.

5. Thus, economists pay close attention to the natural experiments offered by history.

B. The Role of Assumptions

1. Assumptions can simplify the complex world and make it easier to understand.

2. Example: to understand international trade, it may be helpful to start out assuming that there are only two countries in the world producing only two goods. Once we understand how trade would work in this simplified world, we are in a better position to understand trade in the more complex world in which we live.

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3. One important role of a scientist is to understand which assumptions one should make.

4. Economists use different assumptions to answer different questions.

C. Economic Models

1. Economists use economic models to explain the world around us.



To illustrate to the class how simple but unrealistic models can be useful, bring a road map to class. Point out how unrealistic it is. For example, it does not show where all of the stop signs, gas stations, or restaurants are located. It assumes that Earth is flat and two-dimensional. But, despite these simplifications, a map usually helps travellers get from one place to another. Thus, it is a good model.

2. Most economic models are composed of diagrams and equations and omit many details to allow us to see what is truly important.

3. The goal of a model is to simplify reality in order to increase our understanding of it. This is where the use of assumptions is helpful.

Activity 1—Realism and Models: An Analogy

Type: In-class demonstration
Topics: Models
Materials needed: Airplane kit, sheet of paper
Time: 5 minutes
Class limitations: Works in any class size

Ask the class if a realistic model is better than an unrealistic model.

Show them the airplane model kit. Describe some of the details included in the model (rivets, canopy, struts, etc.). Shake the box to rattle the large number of parts. This is a fairly realistic model, although obviously not a real airplane. Its complexity adds realism, but at a cost; assembling the model is very time consuming. Drop the box on the floor. Tell the class, "This model, even when completed, cannot fly."

Take a sheet of paper and fold it into a paper airplane. Show the class this new model. Its virtues include simplicity and ease of assembly, but it is less realistic than the airplane model kit. Throw the airplane and explain, "While less detailed, this model can glide through the air."

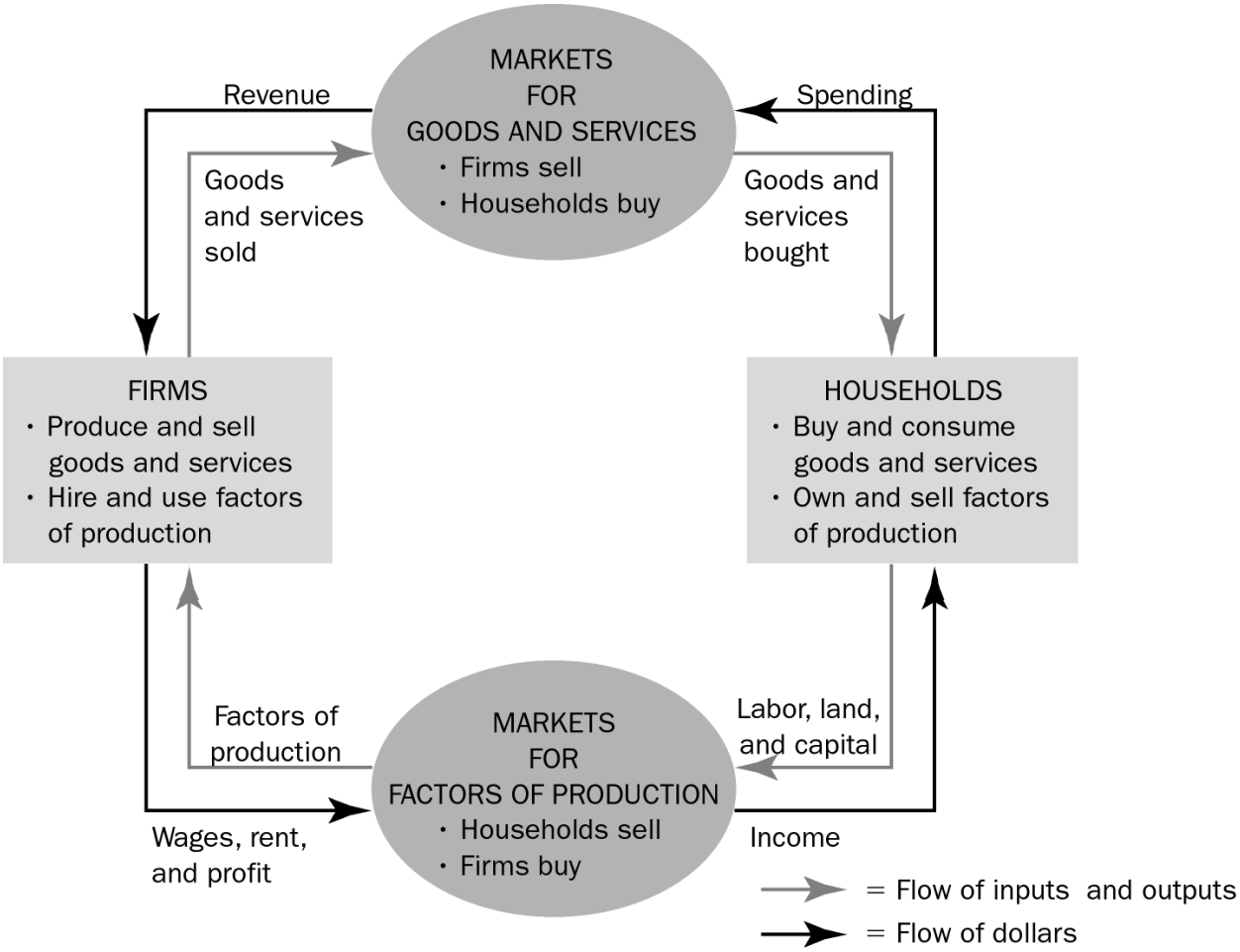
Economic models are like the airplane model. They are much less complex than the real world, but they can show how markets actually work.

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D. Our First Model: The Circular-Flow Diagram

Figure 2.1



1. Definition of **<u>circular-flow diagram</u>: a visual model of the economy that shows how dollars flow through markets among households and firms.**

2. This diagram is a very simple model of the economy. Note that it ignores the roles of government and international trade.

   a. There are two decision makers in the model: households and firms.

   b. There are two markets: goods market and factor market.

   c. Firms are sellers in the goods market and buyers in the factor market.

   d. Households are buyers in the goods market and sellers in the factor market.

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e. The inner loop represents the flows of inputs and outputs between households and firms.

f. The outer loop represents the flows of dollars between households and firms.

E. Our Second Model: The Production Possibilities Frontier

1.

a. Definition of **production possibilities frontier: a graph that shows the combinations of output that the economy can possibly produce given the available factors of production and the available production technology.**

b. Unlike the circular-flow model, most economic models are built using the tools of mathematics.



Spend more time with this model than you think is necessary. Be aware that the math skills of most of your students will be limited. It is important for the students to feel confident with this first graphical and mathematical model. Be deliberate with every point. If you lose them with this model, they may be gone for the rest of the course. Try to apply real-life examples to the model to help show its usefulness.

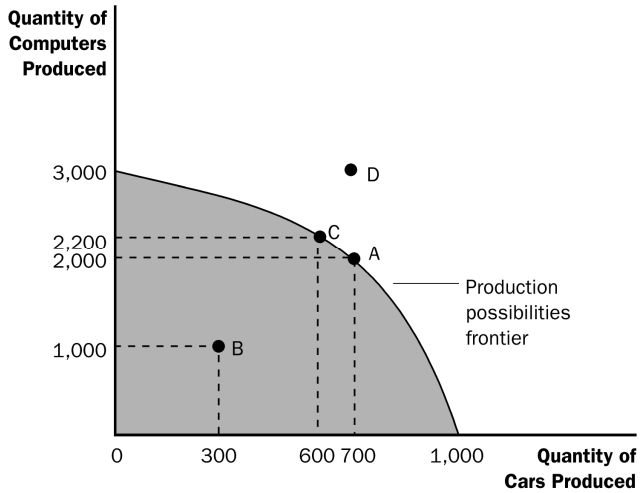
2. Example: a country that produces only two goods, cars and computers.

a. If all resources are devoted to producing cars, the economy can produce 1000 cars and zero computers.

b. If all resources are devoted to producing computers, the economy can produce 3000 computers and zero cars.

c. If resources are divided between the two industries, the feasible combinations of output are shown on the curve by points A and C.

Figure 2.2



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You may want to include time dimensions for variables to make it clear that the production data are measured in terms of annual flows. This will help students to realize that a new production possibilities frontier occurs for each year. Thus, the axes show the level of output per year.



It is useful to point out that the production possibilities curve depends on two things: the availability of resources and the level of technology.

ALTERNATIVE CLASSROOM EXAMPLE:
A small country produces two goods: corn (measured in bushels) and trucks. Points on a production possibilities frontier can be shown in a table or a graph:

	A	**B**	**C**	**D**	**E**
Trucks	0	10	20	30	40
Corn	70	60	45	25	0

The production possibilities frontier should be drawn from the numbers above.

Students should be asked to calculate the opportunity cost of increasing the number of trucks produced by ten:
- between 0 and 10
- between 10 and 20
- between 20 and 30
- between 30 and 40

3. Production is *efficient* at points on the curve. This implies that the economy is getting all it can from the scarce resources it has available.

4. Production at a point inside the curve is *inefficient* but possible. It means the economy is producing less than it could from the resources it has available.

5. Production at a point outside of the curve is not possible given the economy's current level of resources and technology.

6. The production possibilities frontier reveals Principle #1: People face tradeoffs.

   Suppose the economy is currently producing 600 cars and 2200 computers. To increase the production of cars to 700, the production of computers must fall to 2000.

7. Principle #2 is also shown on the production possibilities frontier: The cost of something is what you give up to get it (opportunity cost).

   The opportunity cost of increasing the production of cars from 600 to 700 is 200 computers.

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Be aware that students often have trouble understanding why opportunity costs rise as the production of a good increases. You may want to use several specific examples of resources that are more suited to producing cars than computers (e.g., an experienced mechanic) as well as examples of resources that are more suited to producing computers than cars (e.g., an experienced computer programmer).

8. The shape of the production possibilities frontier indicates that the opportunity cost of cars in terms of computers increases as the country produces more cars and fewer computers. This occurs because some resources are better suited to the production of cars than computers (and vice versa).

9. The production possibilities frontier can shift if resource availability or technology changes.

Activity 2—Screwdrivers and Bloody Marys

Type: In-class discussion
Topics: Graphing, opportunity cost, tradeoffs
Materials needed: None
Time: 10 minutes
Class limitations: Works in any class size

Instructions
Draw a graph with Bloody Marys on the horizontal axis and Screwdrivers on the vertical axis.

A Bloody Mary contains tomato juice and one shot of vodka. A screwdriver contains orange juice and one shot of vodka. Assume that we have plenty of orange juice and tomato juice, but only one small bottle of vodka containing 6 shots.

How many Bloody Marys can we make if we only make Bloody Marys?
How many Screwdrivers can we make if we only make Screwdrivers?
Could we make 6 of both drinks? Why not?

On your graph, show all of the possible combinations of Bloody Marys and Screwdrivers that can be made, given a small bottle of vodka.

Points for Discussion
The combinations will make a linear production possibilities curve that is continuous since we could make half drinks, quarter drinks, or any fraction of either drink.

Several basic graphing techniques can be demonstrated: inverse relation, negative slope, etc.

The economic points are more interesting: We can produce any combination on or inside the line. If we produce inside the line, we are not fully using our resources. This is inefficient.

If we do use all of our scarce resources, increasing the production of one drink requires sacrificing production of the other. This lost production is opportunity cost.

Show what would happen to the curve should we suddenly get another small bottle of vodka.

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You may also want to teach students about budget constraints at this time (call them "consumption possibilities frontiers"). This reinforces the idea of opportunity cost, and allows them to see how opportunity cost can be measured by the slope. Also, it will introduce students to the use of a straight-line production possibilities frontier (which is used in Chapter 3). However, be careful if you choose to do this as students find the difference between straight-line and concave production possibilities curves challenging.

ALTERNATIVE CLASSROOM EXAMPLE:
Ivan receives an allowance from his parents of $10 each week. He spends his entire allowance on two goods: ice cream cones (which cost $1 each) and tickets to the movies (which cost $5 each).

Students should be asked to calculate the opportunity cost of one movie and the opportunity cost of one ice cream cone.

Ivan's consumption possibilities frontier (budget constraint) can be drawn. It should be noted that the slope is equal to the opportunity cost and is constant because the opportunity cost is constant.

Ask students what would happen to the consumption possibilities frontier if Ivan's allowance changes or if the price of ice cream cones or movies changes.

F. Microeconomics and Macroeconomics

1. Economics is studied on various levels.

a. Definition of **microeconomics: the study of how households and firms make decisions and how they interact in markets.**

b. Definition of **macroeconomics: the study of economy-wide phenomena, including inflation, unemployment, and economic growth.**

2. Microeconomics and macroeconomics are closely intertwined because changes in the overall economy arise from the decisions of millions of individual households and firms.

3. Because microeconomics and macroeconomics address different questions, they sometimes take different approaches, have their own set of models, and are often taught in separate courses.

II. The Economist as Policy Adviser

A. Positive versus Normative Analysis

1. Example of a discussion of minimum-wage laws: Polly says, "Minimum-wage laws cause unemployment." Norm says, "The government should raise the minimum wage."

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2. Definition of **positive statements: claims that attempt to describe the world as it is.**

3. Definition of **normative statements: claims that attempt to prescribe how the world should be.**

4. Positive statements can be evaluated using data, while normative statements involve personal viewpoints.

5. Positive views about how the world works can affect the normative views about what policies are desirable.



Use several examples to illustrate the differences between positive and normative statements and stimulate classroom discussion. Possible examples include the minimum wage, budget deficits, tobacco taxes, legalization of marijuana, and seat-belt laws.



Have students bring in newspaper articles and, in groups, identify each statement in an editorial paragraph as being a positive or normative statement. Discuss the difference between straight news stories and editorials and the analogy to economists as scientists and as policy advisers.

B. Economists in Ottawa

1. Economists are aware that tradeoffs are involved in most policy decisions.

2. Several federal government departments rely on the advice of economists—Finance Canada, Global Affairs Canada, Competition Bureau, Employment and Social Development Canada, the Bank of Canada, and Statistics Canada.

3. The World Wide Web addresses, in Table 2.1, the organizations that hire economists and influence economic policy.

4. The research and writings of economists can also indirectly affect public policy.

C. Why Economists' Advice Is Not Always Followed

1. Figuring out the right policy is only part of the job for the government.

2. Politicians must consider and get advice from various bodies before implementing any new policy.

III. Why Economists Disagree

A. Differences in Scientific Judgments

1. Economists sometimes disagree about the validity of alternative theories or about the size of important parameters that measure how economic variables are related and the effects on the behaviour of households and firms.

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2. Example: some economists feel that a change in the tax system that would eliminate a tax on income and create a tax on consumption would increase saving in this country. However, other economists feel that the change in the tax system would have little effect on saving behaviour and therefore do not support the change.

B. Differences in Values

1. Economists give advice based on different values rather than being based on scientific grounds only.

C. Perception versus Reality

1. While it seems as if economists do not agree on much, this is in fact not true. Table 2.2 contains 17 propositions that are endorsed by a majority of economists.



Emphasize that more agreement exists among economists than most people think. The reason for this is probably that the things that are generally agreed upon are boring to most non-economists.

2. Almost all economists believe that rent control adversely affects the availability and quality of housing and is a costly way of helping the neediest members of society. Yet many provinces apply some form of rent control.

3. While most economists oppose barriers to trade, Parliament has chosen to restrict the importation of certain goods.

IV. Appendix—Graphing: A Brief Review

1. Graphs serve two purposes. First, when developing economic theories, they offer a way to visually express ideas. Second, when analyzing economic data, graphs provide a powerful way of finding and interpreting patterns.



Many instructors may be unaware of how much trouble beginning students have grasping the most basic graphs. It is important for instructors to make sure that students are comfortable with these techniques.

A. Graphs of a Single Variable

1. Pie Chart

2. Bar Graph

3. Time-Series Graph

B. Graphs of Two Variables: The Coordinate System

1. Economists are often concerned with relationships between two or more variables.

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2. Ordered pairs of numbers can be graphed on a two-dimensional grid.

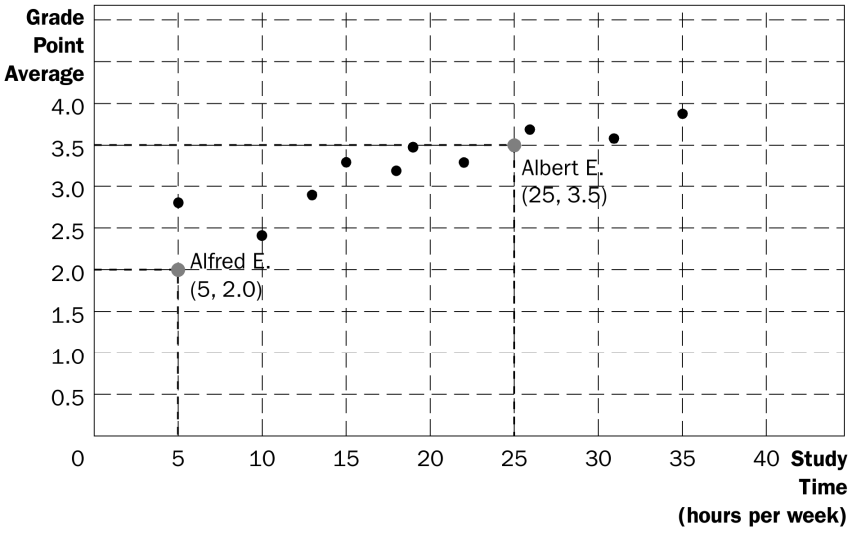
   a. The first number in the ordered pair is the *x*-coordinate and tells us the horizontal location of the point.

   b. The second number in the ordered pair is the *y*-coordinate and tells us the vertical location of the point.

3. The point with both an *x*-coordinate and a *y*-coordinate of zero is called the origin.

4. Two variables that increase or decrease together have a positive correlation.

5. Two variables that move in opposite directions (one increases when the other decreases) have a negative correlation.



C. Curves in the Coordinate System

1. Often, economists want to show how one variable affects another, holding all other variables constant.

   a. An example of this is a demand curve.

   b. The demand curve shows how the quantity of a good a consumer wants to purchase varies as its price varies, holding everything else (such as income) constant. It is downward sloping, indicating the negative relation between the two variables. See Figure 2A.3.

   c. If income does change, this will alter the amount of a good that the consumer wants to purchase at any given price. Thus, the relationship between price and quantity desired has changed and must be represented as a new demand curve. See Figure 2A.4.

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d. A simple way to tell if it is necessary to shift the curve is to look at the axes. When a variable that is not named on either axis changes, the curve shifts otherwise it will be a movement along the curve.

D. Slope

1. We may want to ask how strongly a consumer reacts if the price of a product changes.

   a. If the demand curve is very steep, quantity desired does not change much in response to a change in price.

   b. If the demand curve is very flat, quantity desired changes a great deal when the price changes.

2. The slope of a line is the ratio of the vertical distance covered to the horizontal distance covered as we move along the line ("rise over run").

$$\text{slope} = \frac{\Delta y}{\Delta x}$$

3. A small slope means that the demand curve is relatively flat; a large slope means that the demand curve is relatively steep.

4. A positive number indicates an upward-sloping line while a negative number indicates a downward-sloping line.

5. The slope of a straight line will be constant.

E. Graphing Functions

1. When looking at the relationship between variables, for example like a demand curve, we can express it like this: the demand is a *function* of the price, where "function of" means "depends on."

2. Mathematically, in general terms we could write: $Q^D = f(P)$.

3. The general functional form for a linear demand curve is: $Q^D = f(P) = a - bP$ where *a* and *b* are called the parameters of the function. The negative sign indicates the negative slope.

4. Once we know the values for *a* and *b*, we can plug any price into the function and determine the demand.

5. We can use the *x*- and *y*-intercepts to easily calculate the slope of a linear demand curve.

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F. Cause and Effect

1. Economists often make statements suggesting that a change in Variable A causes a change in Variable B. Therefore, graphs can be used to visualize this.

2. Ideally, we would like to see how changes in Variable A affect Variable B, holding all other variables constant.

3. This is not always possible and could lead to a problem caused by omitted variables.

    a. If Variables A and B both change at the same time, we may conclude that the change in Variable A caused the change in Variable B.

    b. But, if Variable C has also changed, it is entirely possible that Variable C is responsible for the change in Variable B.

4. Another problem is reverse causality.

    a. If Variable A and Variable B both change at the same time, we may believe that the change in Variable A led to the change in Variable B.

    b. However, it is entirely possible that the change in Variable B led to the change in Variable A.

    c. It is not always as simple as determining which variable changed first because individuals often change their behaviour in response to a change in their expectations about the future. This means that Variable A may change before Variable B but only because of the expected change in Variable B.

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