International Economics 16th edition Thomas Pugel Solutions Manual

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Chapter 2

The Basic Theory Using Demand and Supply

Overview

This chapter indicates why we study theories of international trade and presents the basic theory using supply and demand curves. Trade is important to individual consumers, to workers and other factor owners, to firms, and therefore to the whole economy. The box "Trade Is Important" provides useful data about the types of products traded and the increasing role of trade in national economies.

Trade is also contentious, with perpetual battles over government policies toward trade. To understand the controversy, we need to develop theories of why people trade as they do.

It is useful to organize the analysis of international trade by contrasting a world of no trade with a world of free trade, leaving analysis of intermediate cases (e.g., non-prohibitive tariffs) for Chapter 8-14. The analysis seeks to answer four key questions about international trade:

1. Why do countries trade? What determines the pattern of trade?
2. How does trade affect production and consumption in each country?
3. What are the gains (or losses) for a country as a whole from trading?
4. What are the effects of trade on different groups in a country? Are there groups that gain and other groups that lose?

Theories of international trade provide answers to these four questions.

Basic demand and supply analysis can be used to provide early answers to these four questions, as well as to introduce concepts that can be used in more elaborate theories. Using motorbikes as an example, the chapter first reviews the basic analysis of both demand (the demand curve and the role of the product's price, other influences on quantity demanded, movements along the demand curve and shifts in the demand curve, and the price elasticity of demand as a measure of responsiveness) and supply (the supply curve, the role of marginal cost, other influences on quantity supplied, movements along the supply curve and shifts in the supply curve, and the price elasticity of supply). It pays special attention to the meaning and measurement of consumer surplus and producer surplus. This section, which focuses on review and development of basic tools, ends with the picture of market equilibrium in a national market with no trade as the intersection of the domestic demand curve and the domestic supply curve.

The remainder of the chapter examines the use of supply and demand curves to analyze international trade. If there are two national markets for a product and no trade between them, it is likely that the product's price will differ between the two markets. Someone should notice the difference and try to profit by arbitrage between the two markets. If governments permit free trade, then the export supply from the initially low-priced market (the rest of the world in the textbook example) can satisfy the import demand in the initially high-priced market (the United States in the textbook example), and the world shifts to a free-trade equilibrium. We can show this free trade equilibrium by deriving the supply-of-exports curve for the rest of the world and

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the demand-for-imports curve for the United States. The international market for the product clears at the intersection of the export-supply and import-demand curves, indicating the equilibrium international or world price and the quantity traded. This equilibrium world price also becomes the domestic price in each country with free trade.

The same set of three graphs (the two national markets and the international-trade market) is used to show the effects of the shift from no-trade to free-trade on different groups in each country and to show the net gains from trade for each nation. In the importing country consumers of the product gain consumer surplus and producers of the product lose producer surplus. Using the one-dollar, one-vote metric, the country as a whole gains, because the gain in consumer surplus is larger than the loss of producer surplus. In the exporting country producers of the product gain producer surplus and consumers of the product lose consumer surplus. The analysis shows that the country as a whole gains because the gain in producer surplus is larger than the loss of consumer surplus. Furthermore, the country that gains more from the shift to free trade is the country whose price changes more—the country with the less elastic trade curve (import demand or export supply).

Tips

We believe that this chapter is an excellent way to introduce the analysis of trade. The four questions about trade focus student attention on key issues that are interesting to most of them. Students then get a quick payoff through the use of the familiar supply-demand framework. By the end of this short chapter we have preliminary answers to all four trade questions. We have also laid a solid foundation for the analysis of trade using supply and demand curves, the approach that will receive the most attention in Chapter 8-14 on trade policies.

In class presentations it may be useful to show the graphs in a sequence, perhaps using a series of slides. After presenting the review of demand and supply and the national market equilibrium with no trade, the following sequence works well.

1. Two national market graphs with no trade, one with a high no-trade price (the United States), and one with a low no-trade price (the rest of the world, or ROW). Question to the class: “If you were the first person to notice this situation, could you make a profit?” This is a good way to motivate international trade driven by arbitrage.
2. The U.S. national market graph and the international market graph. Question to the class: “Let’s say that the United States is willing to open up to free trade and integrate into the world market. If it does this, the world price will also be the price within the United States. How much will the United States want to import?” It depends on what the world price is. The instructor can pick one or two hypothetical world price(s) (below the no-trade U.S. price), and measure the gap between domestic quantity demanded and domestic quantity supplied. This is the U.S. demand for imports, and these import quantity-price combinations can be used to plot the U.S. demand-for-imports curve in the international market.
3. A graph of the international market and the ROW national market. A comparable discussion to item 2 above, to derive the supply-of-exports curve.
4. Superimpose the graphs from item 2 on the graphs from item 3. Question to the class: “What will happen with free trade? When there is ongoing free trade, what is the equilibrium world

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price?" This set of three graphs can be used to show the free-trade equilibrium: world price, quantity traded, and quantities produced and consumed in each country.
5. A single graph showing the U.S. national market, to contrast no trade with free trade. Questions to the class: "What group is made happier by the shift from no trade to free trade? What group is a loser? Can we somehow say that the country gains from free trade?"
6. A single graph showing the ROW national market, with the same questions in item 5.

The next Chapters 3-7 present additional theories of trade. The figure shown on the accompanying page provides a summary of the key features of these theories. It may be useful to copy and distribute this figure to your students. If it is distributed when the class begins to study the material, it can serve as a roadmap. If it is distributed when the class finishes the lectures on the material, it can serve as a summary and review.

For instructors who want to begin with the discussion of absolute and comparative advantage rather than with the supply-and-demand framework that focuses on a single product, this should be possible. After covering the introductory material (the first two pages of Chapter 2, and, possibly, the two boxes in the chapter), the course would skip to Chapter 3. The remaining material from Chapter 2 on the supply and demand analysis can be inserted right after Chapter 4's section referring to analysis using supply and demand curves, or this material can be presented as a separate topic elsewhere in the course.

Chapter 2 has the first of five boxes about the global financial and economic crisis that began in 2007 and became dramatically worse in 2008. The box "The Trade Mini-Collapse of 2009" documents and discusses the sharp decline in global trade that began in late 2008 (and the bounce back that occurred in 2010). With the series of boxes and the discussion of the global crisis in the final section of Chapter 21, an instructor can weave discussions of the global crisis and its aftermath throughout a course.

Suggested answer to case study discussion question

Trade Is Important: For most countries during the past several decades, trade has become more important in the economy. A country's total international trade (exports and imports) has risen as a percentage of national GDP for most countries. Whatever the effects of international trade, they have probably become larger or more pronounced. As discussed in this chapter (and subsequent chapters), some people in the country benefit from international trade, while other people in the country tend to be harmed by international trade. If trade often creates winners and losers, then trade has probably become more controversial as it has become more important in the economy.

Suggested answers to end of chapter questions and problems

1. Consumer surplus is the net gain to consumers from being able to buy a product through a market. It is the difference between the highest price someone is willing to pay for each unit of the product and the actual market price that is paid, summed over all units that are demanded and consumed. The highest price that someone is willing to pay for the unit indicates the value that the buyer attaches to that unit. To measure consumer surplus for a product using real-world data, three major pieces of information are needed: (1) the

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market price, (2) the quantity demanded, and (3) the slope (or shape) of the demand curve in terms of how quantity demanded would change if the market price increased. Consumer surplus could then be measured as the area below the demand curve and above the market-price line.

2. Producer surplus is the net gain to producers from being able to sell a product through a market. It is the difference between the lowest price at which some producer is willing to supply each unit of the product and the actual market price that is paid, summed over all units that are produced and sold. The lowest price at which someone is willing to supply the unit just covers the extra (marginal) cost of producing that unit. To measure producer surplus for a product using real world data, three major pieces of information are needed. First, the market price. Second, the quantity supplied. Third, some information about the slope (or shape) of the supply curve. How would quantity supplied change if the market price decreased? Or, what are the extra costs of producing each unit up to the actual quantity supplied? Producer surplus could then be measured as the area below the market price line and above the supply curve.

3. The country's supply of exports is the amount by which the country's domestic quantity supplied exceeds the country's domestic quantity demanded. The supply-of-exports curve is derived by finding the difference between domestic quantity supplied and domestic quantity demanded for each possible market price for which quantity supplied exceeds quantity demanded. The supply-of-exports curve shows the quantity that the country would want to export for each possible international market price.

4. The country's demand for imports is the amount by which the country's domestic quantity demanded exceeds the country's domestic quantity supplied. The demand-for-imports curve is derived by finding the difference between domestic quantity demanded and domestic quantity supplied, for each possible market price for which quantity demanded exceeds quantity supplied. The demand-for-imports curve shows the quantity that the country would want to import for each possible international market price.

5. There is no domestic market for winter coats in this tropical country, but there is a domestic supply curve. If the world price for coats is above the minimum price at which the country would supply any coats (the price at which the supply curve hits the price axis), then in free trade the country would produce and export coats. The country gains from trade because it creates producer surplus—the area above the supply curve and below the international price line, up to the intersection (which indicates the quantity that the country will produce and export).

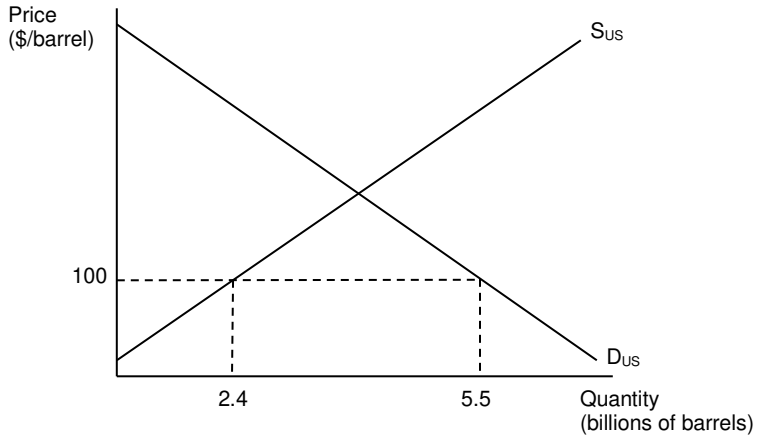
6. If there were no exports of scrap iron and steel, the domestic market would clear at the price at which domestic quantity demanded equals domestic quantity supplied. But the United States does export scrap iron and steel. The extra demand from foreign buyers increases the market price of scrap iron and steel. Domestic users of scrap iron and steel pay a higher price than they would if there were no exports. Thus, some support a prohibition on these exports, in order to lower the market price of the scrap that they buy.

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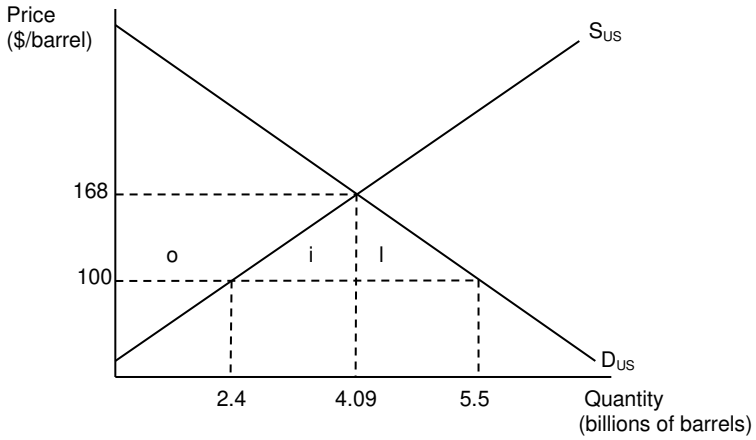
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7. It is true that opening trade bids prices into equality between countries. With a competitive market this also means that marginal costs are equal between countries. But ongoing trade is necessary to maintain this equilibrium. If trade were to stop, the world would return to the no-trade equilibrium. Then prices would differ, and there would be an incentive for arbitrage. The ongoing trade in the free-trade equilibrium is why prices are equalized—trade is not self-eliminating.

8. a. With free trade at \$100 per barrel:
Domestic production Q_S: $100 = 4 + 40Q_S$, or $Q_s = 2.4$ billion barrels.
Domestic consumption Q_D: $100 = 364 - 48Q_D$, or $Q_D = 5.5$ billion barrels.



b. With no imports, domestic quantity supplied must equal domestic quantity demanded (both equal to Q_N) at the domestic equilibrium price P_N:
$364 - 48Q_N = 4 + 40Q_N$, or $Q_N = 4.09$ billion barrels produced and consumed.
Using one of the equations, we can calculate that the domestic price would be almost \$168 per barrel.



c. Domestic producers of oil would gain, receiving an increase of producer surplus shown as area o in the graph. Domestic consumers of oil would lose, experiencing a loss of consumer surplus shown as area o + i + l in the graph.

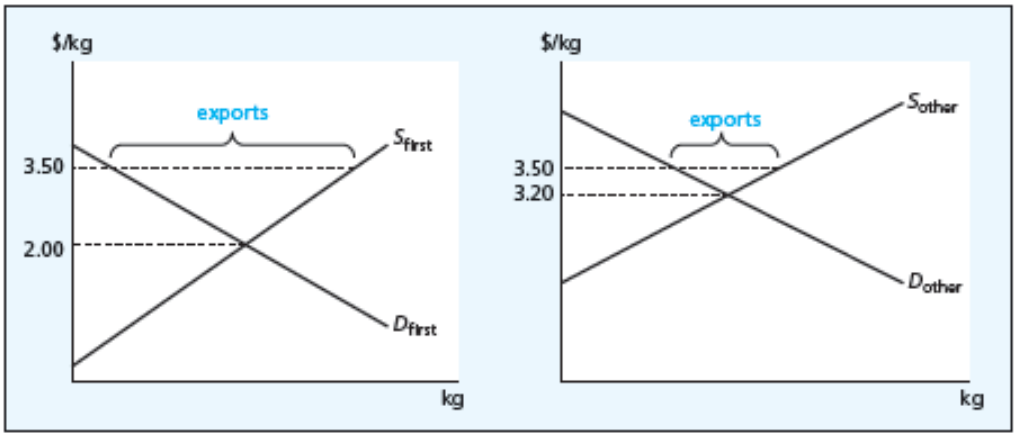
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9. The demand curve D_{US} shifts to the right. The U.S. demand-for-imports curve D_m shifts to the right. The equilibrium international price rises above 1,000. It is shown by the intersection of the new U.S. D_m curve and the original S_x curve.

10. The supply curve S_{US} shifts down (or to the right). The U.S. demand-for-imports curve D_m shifts to the left (or down). The equilibrium international price decreases below 1,000—it is shown by the intersection of the new U.S. D_m curve and the original S_x curve.

11. For the first country, for any world free-trade equilibrium price above $2.00 per kilogram, the country will want to export raisins. For the other country, for any world free-trade equilibrium price above $3.20 per kilogram, this other country will also want to export raisins. With only sellers (exporters) internationally and no buyers (importers) internationally, the international market cannot be in equilibrium. Instead, at this high price, there is an excess supply of raisins. As the graphs below show, at the price of $3.50 per kilogram, both countries want to export—at that price, domestic quantity supplied exceeds domestic quantity demanded for each country.



12. We can still use the basic analysis from this chapter, but changes in consumer surplus count for more than changes in producer surplus. We can examine this case as a deviation from the one-dollar, one-vote metric.

Does the importing country still gain from trade? For the one-dollar, one-vote metric, the importing country gains from trade because the increase in consumer surplus is larger than the loss in producer surplus. If we give more weight to the change in consumer surplus, then, yes, the importing country still gains from trade. Giving more weight to consumer well-being reinforces the net gain from trade.

Does the exporting country still gain from trade? For the one-dollar, one-vote metric, the exporting country gains from trade because the increase in producer surplus is larger than the loss in consumer surplus. If we give more weight to the change in consumer surplus, then we are no longer sure that the exporting country gains from trade. Giving more weight to consumer well-being increases the perceived size of the consumer surplus loss,

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relative to the size of the producer surplus gain. If consumer well-being is sufficiently more important, then we would conclude the exporting country has a net loss from trade.

13. a. With no international trade, equilibrium requires that domestic quantity demanded (Q_D) equals domestic quantity supplied (Q_S). Setting the two equations equal to each other, we can find the equilibrium price with no trade:

$$350 - (P/2) = -200 + 5P$$

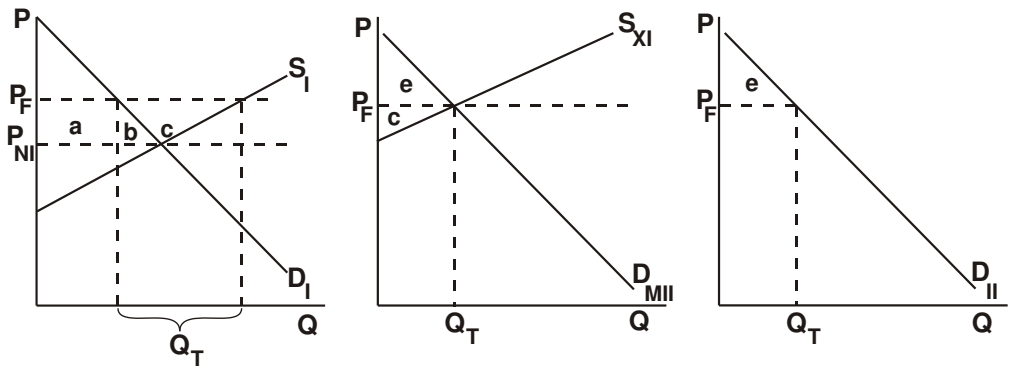
The equilibrium no-trade price is $P = 100$. Using one of the equations, we find that the no-trade quantity is 300.

b. At a price of 120, Belgium's quantity demanded is 290 and its quantity supplied is 400. With free trade Belgium exports 110 units.

c. Belgian consumer surplus declines. With no trade it is a larger triangle below the demand curve and above the 100 price line. With free trade it is a smaller triangle below the demand curve and above the 120 price line.

Belgian producer surplus increases. With no trade it is a smaller triangle above the supply curve and below the 100 price line. With free trade it is a larger triangle above the supply curve and below the 120 price line. The net national gain from trade is the difference between the gain of producer surplus and the loss of consumer surplus. This net national gain is a triangle whose base is the quantity traded (110) and whose height is the change in price (120 – 100 = 20), so the total gain is 1,100.

14. a. In the graphs below, the free trade equilibrium price is P_F, the price at which the quantity of exports supplied by Country I equals the quantity of imports demanded by Country II. (The quantity-of-imports demanded curve for country II is the same as the country's regular demand curve.) This world price is above the no-trade price in country I. The quantity traded with free trade is Q_T.



b. In Country I producer surplus increases by area a + b + c, and consumer surplus falls by area a + b. The net national gain from free trade is area c. In country II consumer surplus increases by area e and this is also the net national gain from trade. Because there is no domestic production in Country II with or without trade, there is no change in producer surplus.

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A guide to the trade theories of Chapter 2-7

Name of Theory	What Forces Determine Trade Flows?	Some Key Assumptions
A. The basic theory (Chapters 2-5)	Productivities Factor Supplies Product demands	Competition in all markets Constant or increasing costs Any number of production factors (types of labor, land, etc.)
B. Supply-oriented theories of trade (special cases of the basic theory, with the demand side neutral):		
1. Absolute advantage (in Chapter 3)	Absolute productivities	Competition in all markets Constant marginal costs Only one factor (labor)
2. Comparative advantage (in Chapter 3)	Relative productivities	Competition in all markets Constant marginal costs Only one factor (labor)
3. Factor proportions (Heckscher-Ohlin theory, in Chapters 4-5)	Relative factor endowments	Competition in all markets Increasing marginal costs Small number of factors Technology neutral
C. Additional theories of trade:		
1. Monopolistic competition (Krugman and others, in Chapter 6)	Product differentiation Moderate scale economies	Imperfect competition De-emphasize factor supplies
2. Global oligopoly (in Chapter 6)	Substantial internal scale economies History, luck, or government policy	Imperfect competition De-emphasize factor supplies
3. External economies (in Chapter 6)	Substantial external scale economies Large home market, history, luck, or government policy	Competition De-emphasize factor supplies
4. Technology differences, including product cycle (Vernon and others, in Chapter 7)	Technological innovation Technological "age" of the industry	Competition Importance of research and development

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