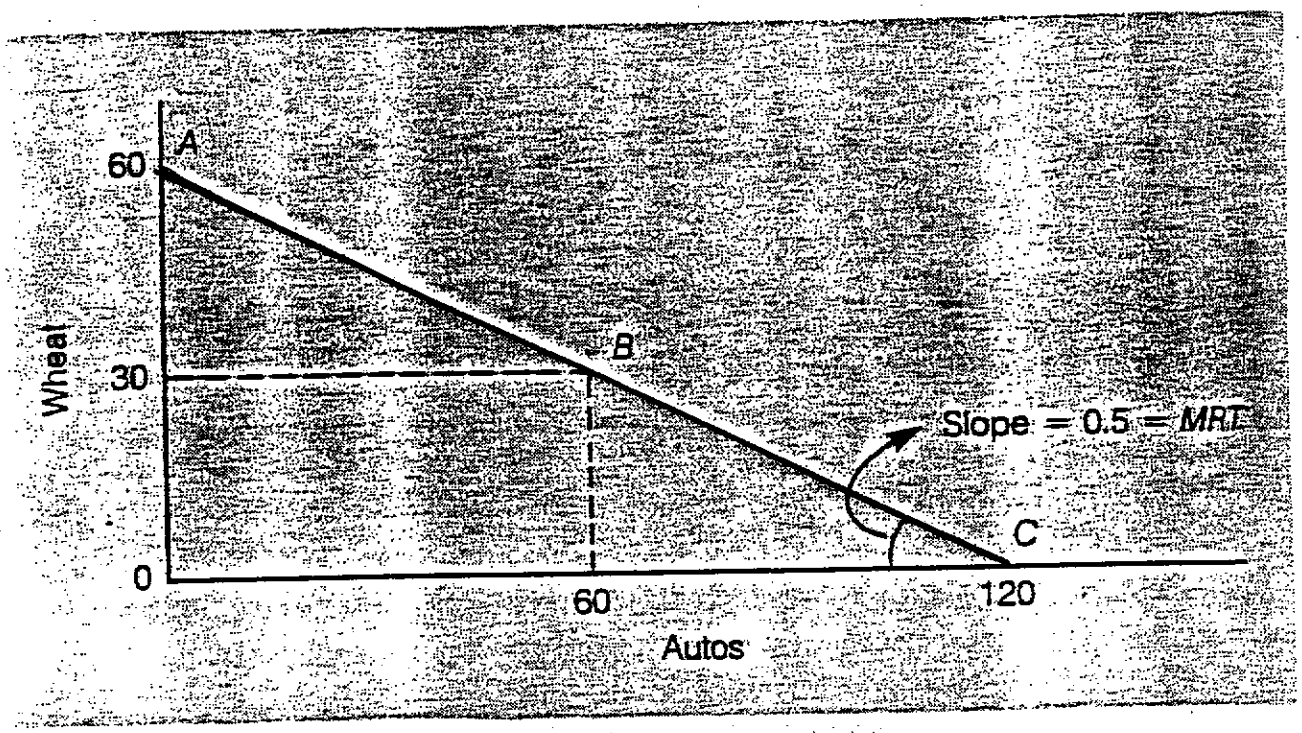


Figure 2.1 *Transformation schedule.* A transformation schedule (production possibilities schedule) illustrates the maximum output possibilities for a nation. It assumes that a nation utilizes all available resources with the available technology. The slope of a transformation schedule indicates the opportunity cost of producing a particular good.

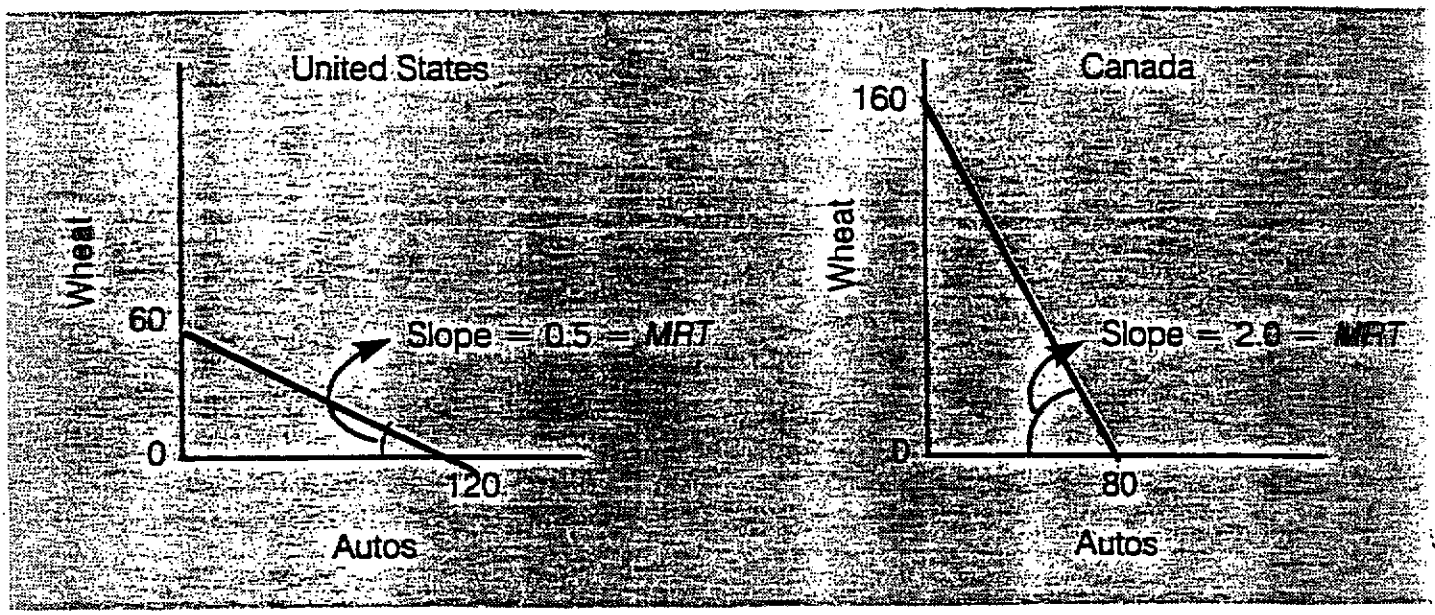


Figure 2.2 *Transformation schedules—constant opportunity costs.* Given constant opportunity cost conditions, the relative cost of producing one good in terms of the other good remains the same, no matter where a nation chooses to locate along its transformation schedule. Constant opportunity costs lead to linear transformation schedules.

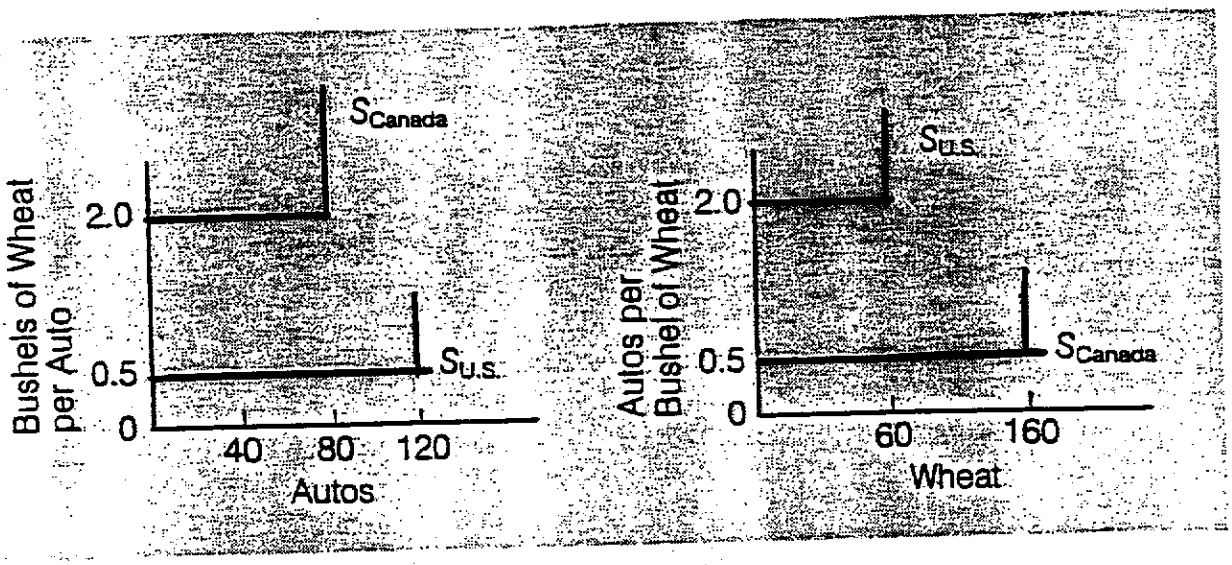


Figure 2.3 *Supply schedules—constant opportunity costs.* With constant opportunity costs, a product's supply schedule is drawn horizontally at its supply price, suggesting that unit costs do not change with the level of output. There are two explanations for constant opportunity costs: (1) resources are perfect substitutes for each other; (2) all units of a given resource are the same quality. The vertical portion of the supply schedule of autos (wheat) corresponds to the endpoint of the transformation schedule of Figure 2.2, where all resources are devoted to auto (wheat) production.

Table 2.1 *Production Gains from Trade*

	Before specialization		After specialization		Net gain (loss)	
	Autos	Wheat	Autos	Wheat	Autos	Wheat
United States	40	40	120	0	80	−40
Canada	40	80	0	160	−40	80
World	80	120	120	160	40	40

Table 2.2 *Consumption Gains from Trade*

	Before trade		After trade		Net gain (loss)	
	Autos	Wheat	Autos	Wheat	Autos	Wheat
United States	40	40	60	60	20	20
nada	40	80	60	100	20	20
world	80	120	120	160	40	40

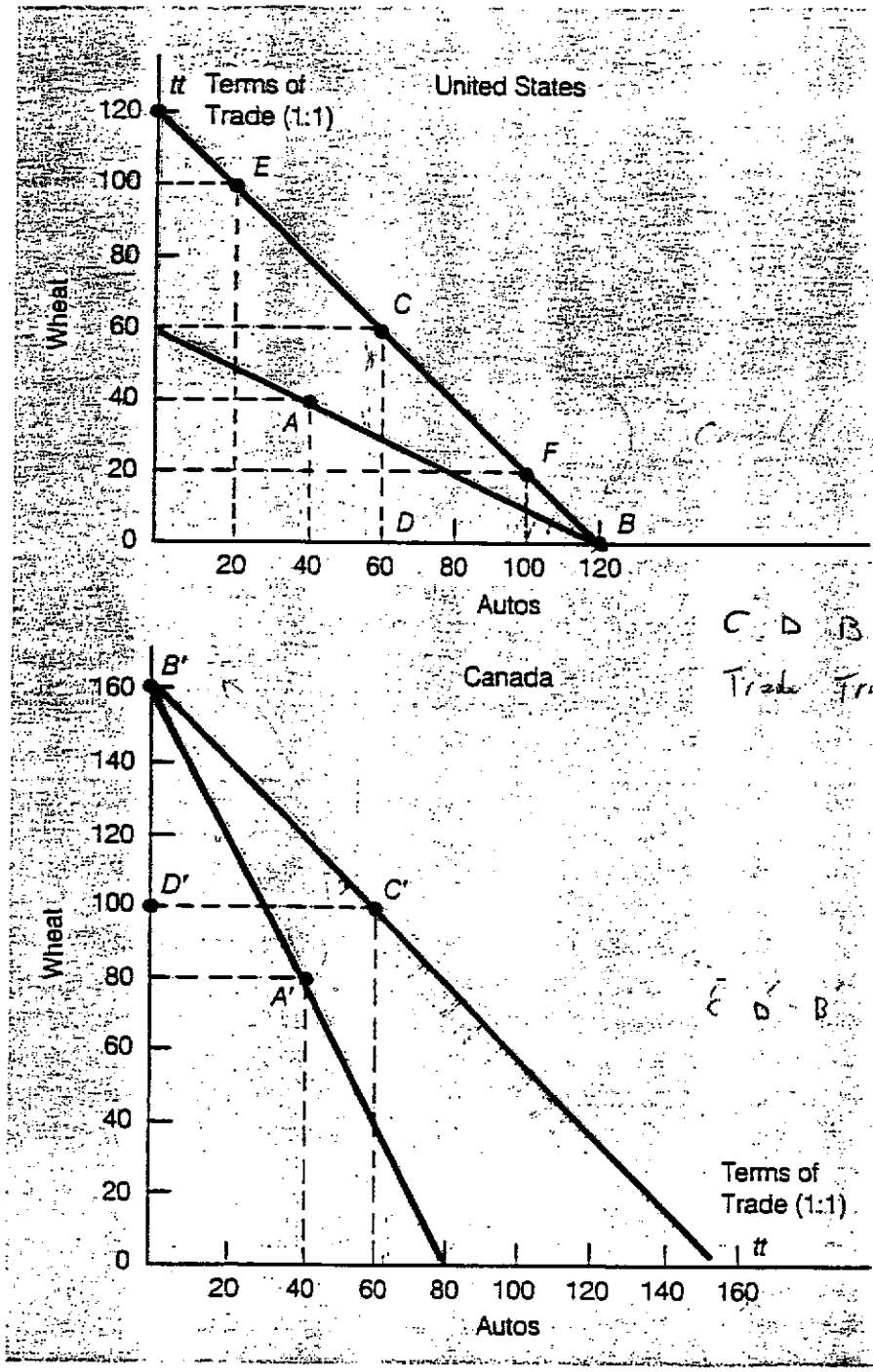


Figure 2.4 *Trading under constant opportunity costs.* With constant opportunity costs, a nation will specialize in the product of its comparative advantage. The principle of comparative advantage implies that with specialization and free trade, a nation enjoys production gains and consumption gains. A nation's trade triangle denotes its exports, imports, and terms of trade. In a two-nation, two-product world, the trade triangle of one nation equals that of the other nation; one nation's exports equal the other nation's imports, and there is one equilibrium terms of trade.

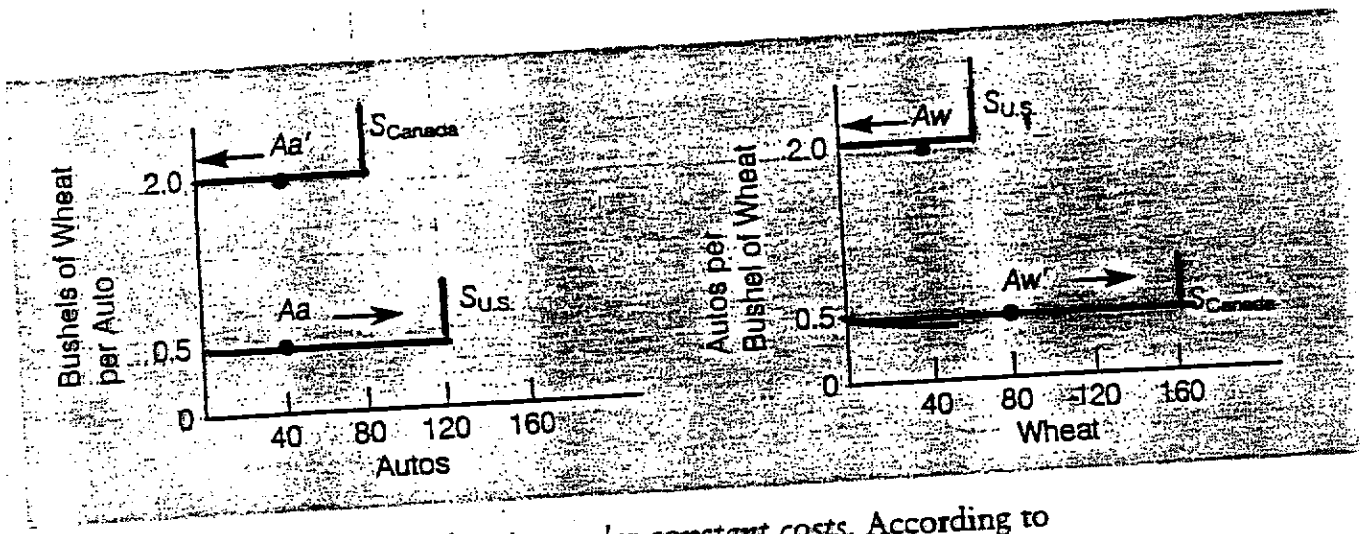
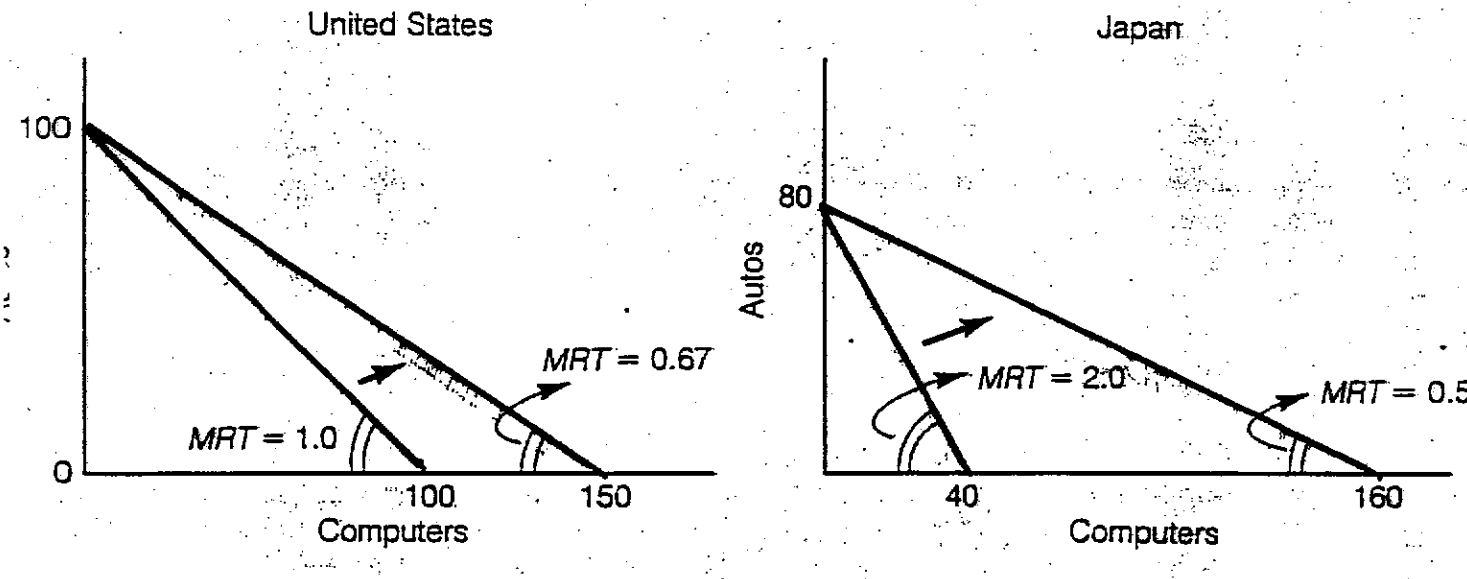


Figure 2.5 *Complete specialization under constant costs.* According to the principle of comparative advantage, complete specialization occurs under constant opportunity costs. Because production costs do not change with the level of output, a nation does not lose its comparative advantage (disadvantage) as it produces more (less) of a product.



ıre 2.6 *Losing comparative advantage.* If productivity in the Japa- computer industry grows faster than it does in the U.S. computer .stry, the opportunity cost of each computer produced in the United :s increases relative to the opportunity cost of the Japanese. U.S. com- rs become less competitive in international markets.

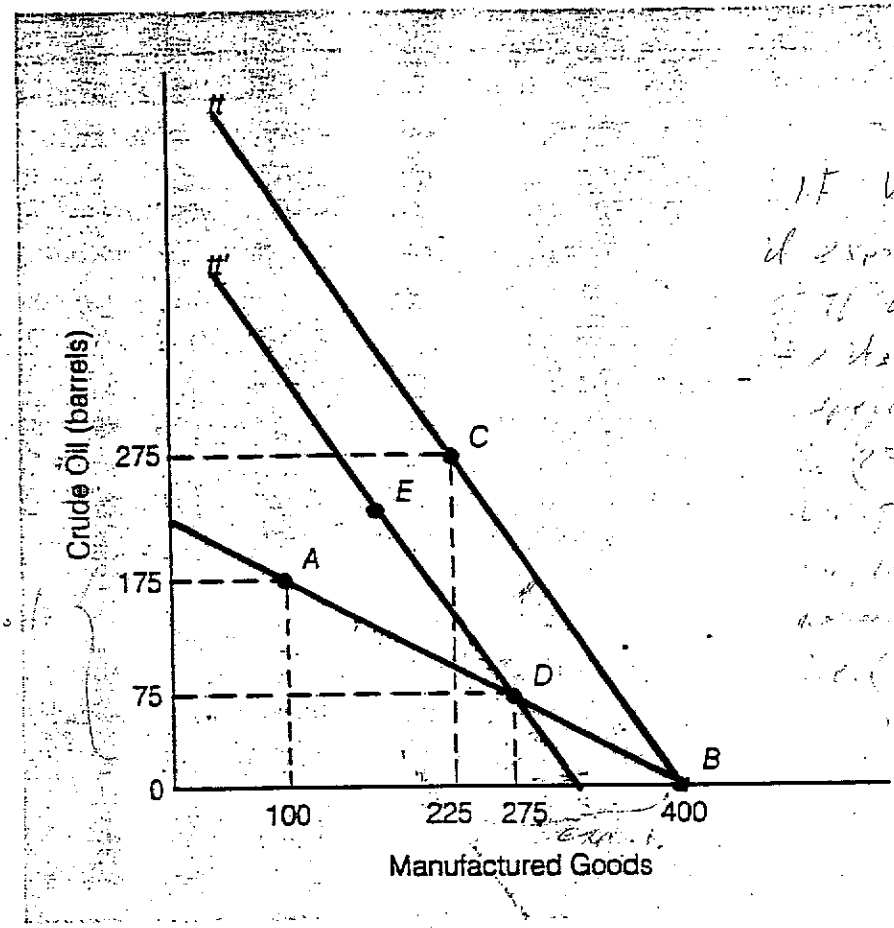


Figure 2.7 *Trade restrictions and the gains from trade.* For a nation to achieve the greatest possible gains from trade, it is necessary that it completely specializes in the production of the commodity of its comparative advantage. Trade restrictions reduce the consumption and production gains from trade by decreasing the volume of trade and the extent of specialization.

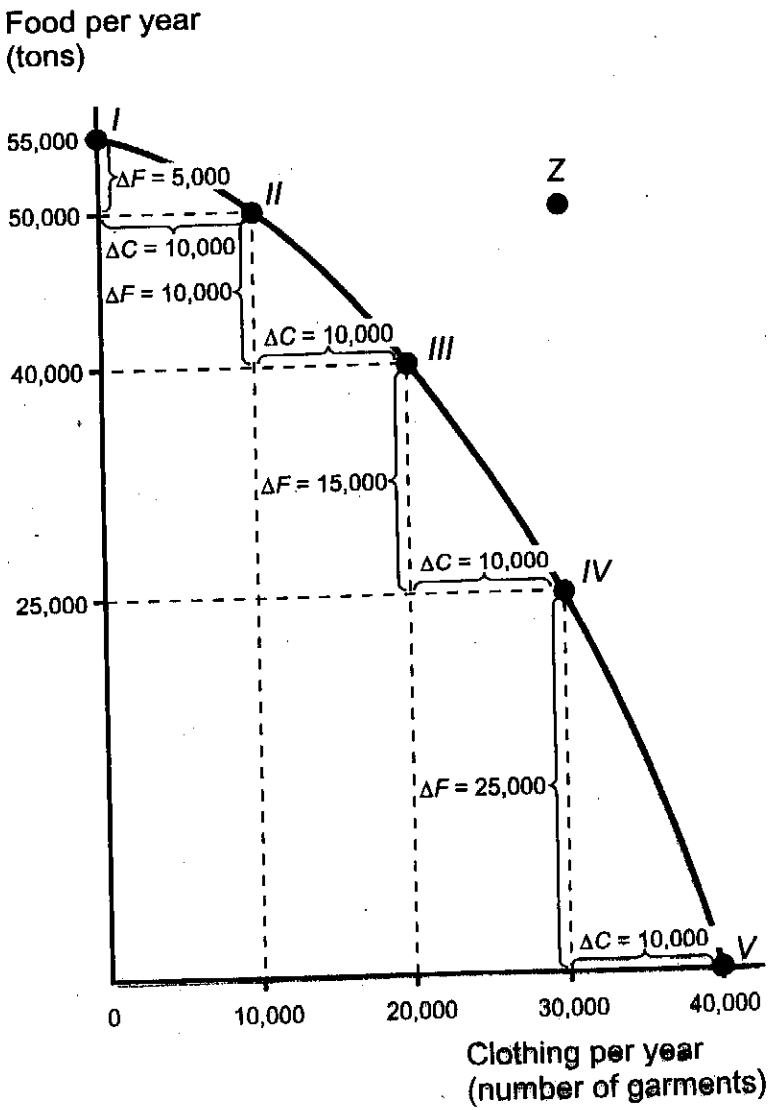
Box 1 A Production Possibilities Curve

Points on this production possibilities curve show alternative combinations of clothing and food that can be produced in an economy assuming that no other products are made. Each point on the curve gives the maximum amount of one good that can be produced given the output of the other good. To reach a point on the curve, resources must be fully utilized and there must be no waste or mismanagement in production.

Annual Production Possibilities for Food and Clothing*

Type of good	Production possibilities I	II	III	IV	V
Food per year (tons)	55,000	50,000	40,000	25,000	0
Clothing per year (number of garments)	0	10,000	20,000	30,000	40,000

* Hypothetical data assuming full utilization of economic resources and no waste or mismanagement in production.

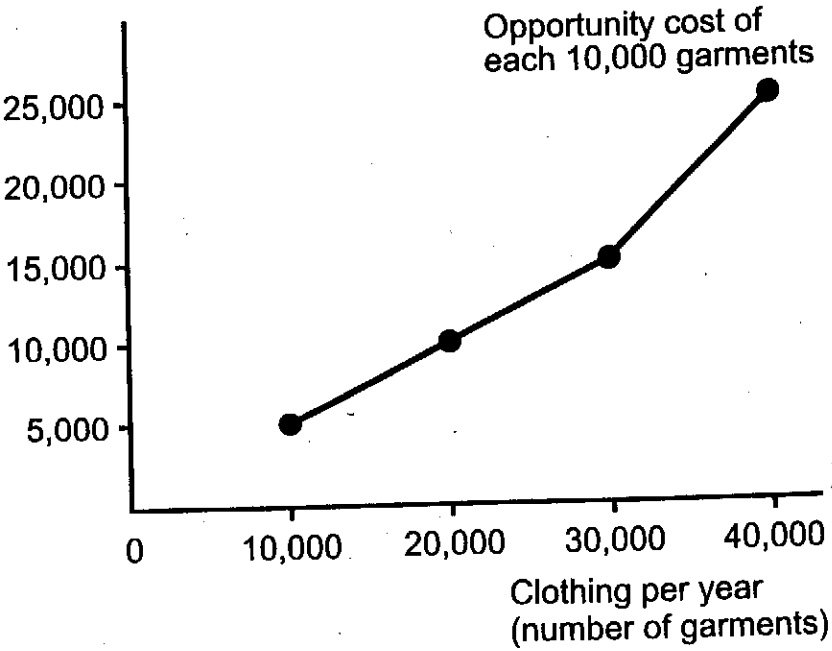


Box 2 Increasing Opportunity Cost of Additional Clothing

The opportunity cost of each 10,000-garment batch of clothing increases as more clothing is produced per year.

Opportunity Cost of Successive 10,000-Garment Batches of Clothing

Annual output of clothing (number of garments)	Increase in clothing output (number of garments) = ΔC	Opportunity cost of each successive 10,000 garments = ΔF
0		
10,000	10,000	5,000 tons of food per year
20,000	10,000	10,000 tons of food per year
30,000	10,000	15,000 tons of food per year
40,000	10,000	25,000 tons of food per year



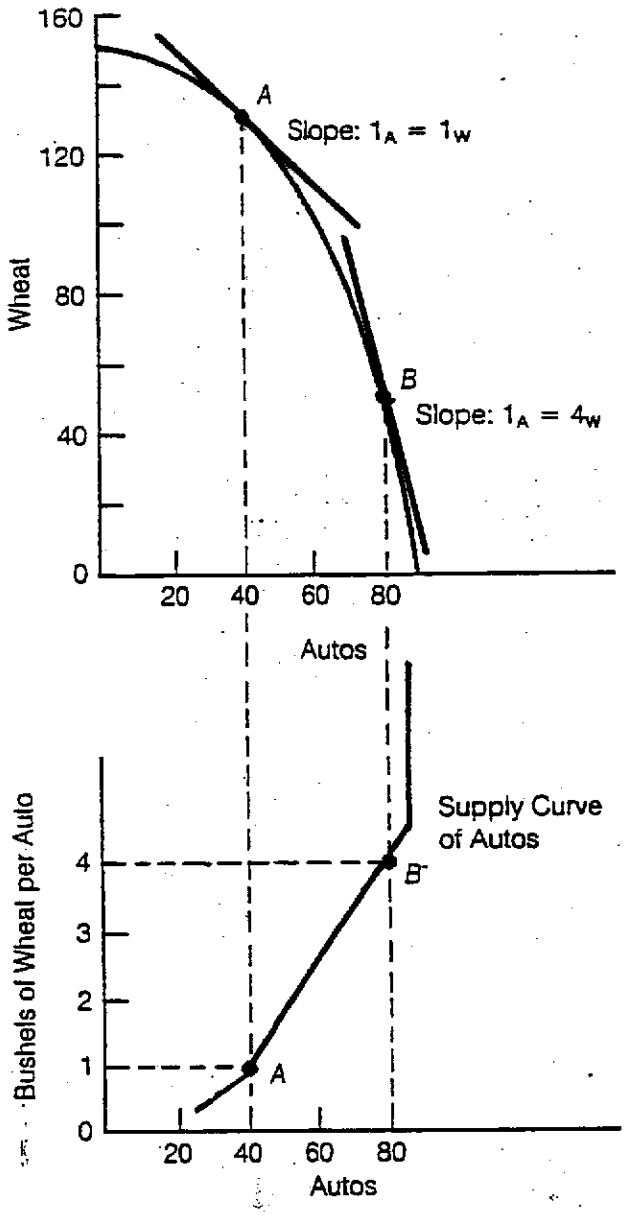


Figure 2.8 *Transformation and supply schedules under increasing cost conditions.* Increasing opportunity costs lead to a transformation schedule that is concave, viewed from the diagram's origin. The marginal rate of transformation equals the (absolute) slope of the transformation schedule. Under increasing costs, a product's supply schedule is upward sloping, suggesting that unit costs rise with the level of output. The vertical portion of the auto supply schedule corresponds to the endpoint of the transformation schedule at which all resources are devoted to auto production.

TABLE 2.7 / Production Gains from Specialization: Increasing Opportunity Costs

	Before Specialization		*After Specialization*		*Net Gain (Loss)*	
	Autos	*Wheat*	*Autos*	*Wheat*	*Autos*	*Wheat*
United States	5	18	12	14	7	−4
Canada	17	6	13	13	−4	7
World	22	24	25	27	3	3

TABLE 2.8 / Consumption Gains from Trade: Increasing Opportunity Costs

	Before Trade		*After Trade*		*Net Gain (Loss)*	
	Autos	*Wheat*	*Autos*	*Wheat*	*Autos*	*Wheat*
United States	5	18	5	21	0	3
Canada	17	6	20	6	3	0
World	22	24	25	27	3	3

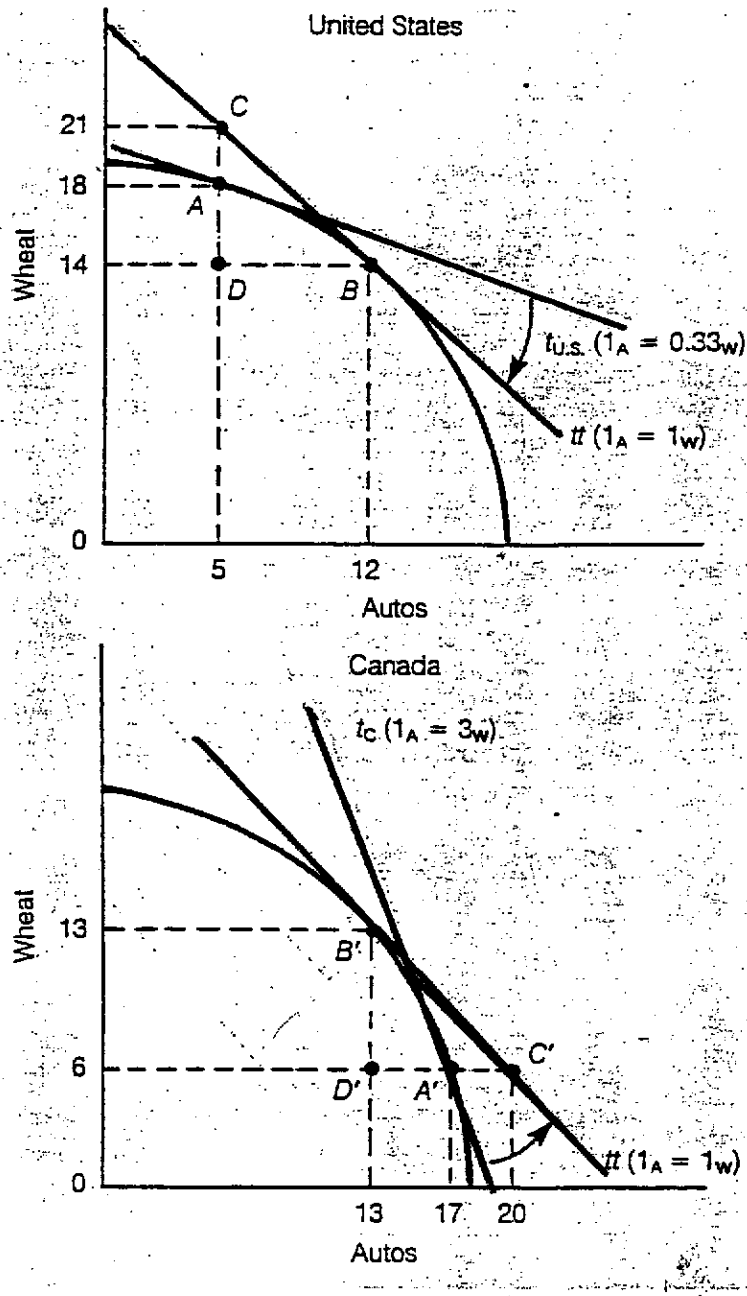


Figure 2.9 *Trading under increasing opportunity costs.* With increasing opportunity costs, comparative product prices in each country are determined by both supply and demand factors. This is unlike the case of production under constant opportunity costs, whereby comparative product prices are determined solely by supply factors; changes in demand do not affect unit production costs and prices.

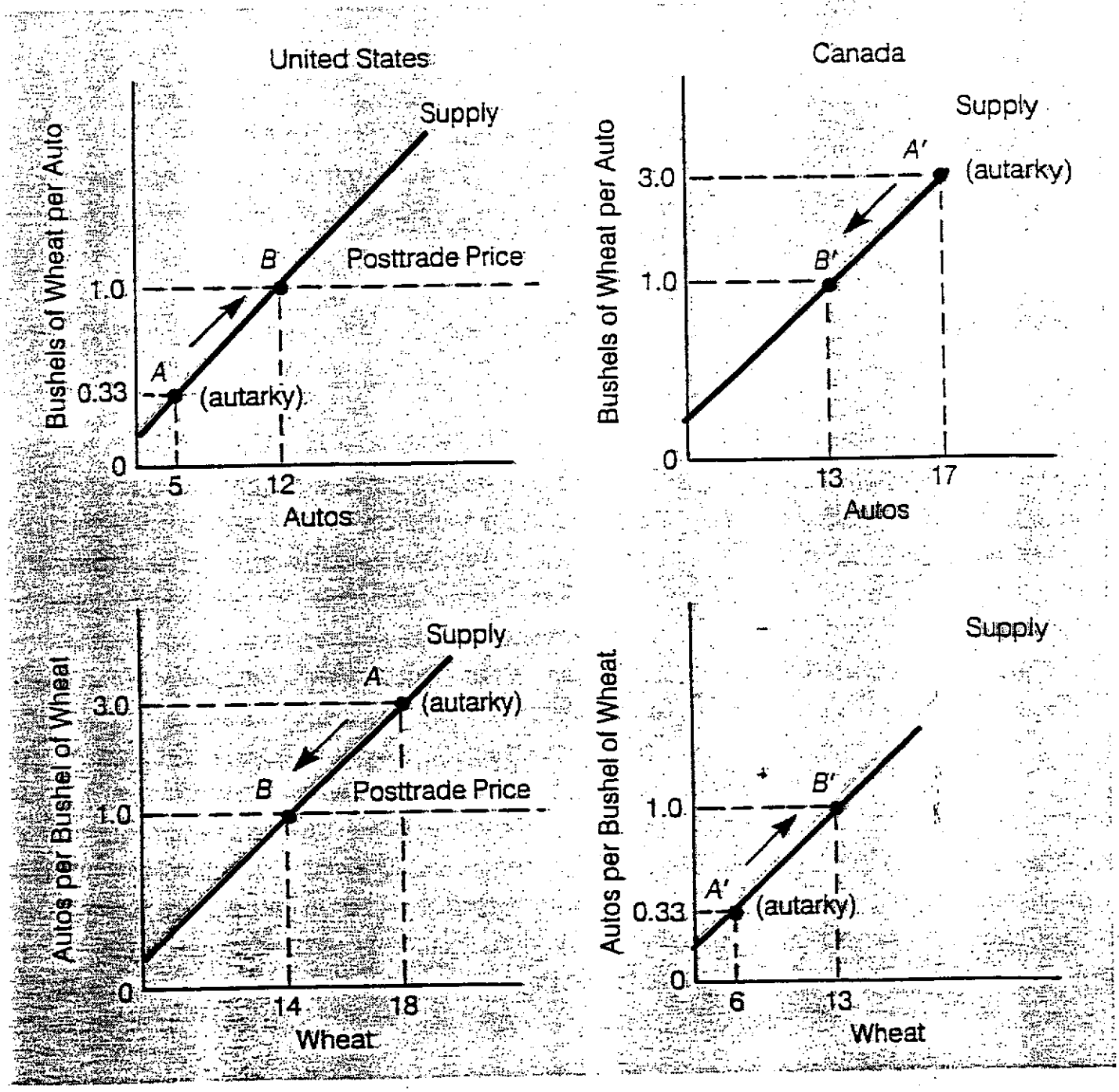


Figure 2.10 *Partial specialization: increasing opportunity costs.* Specialization in production tends to be partial in the case of increasing costs. This is because unit costs rise as each nation produces additional amounts of its export good. As the cost differentials among nations are eliminated, the basis for continued specialization disappears.

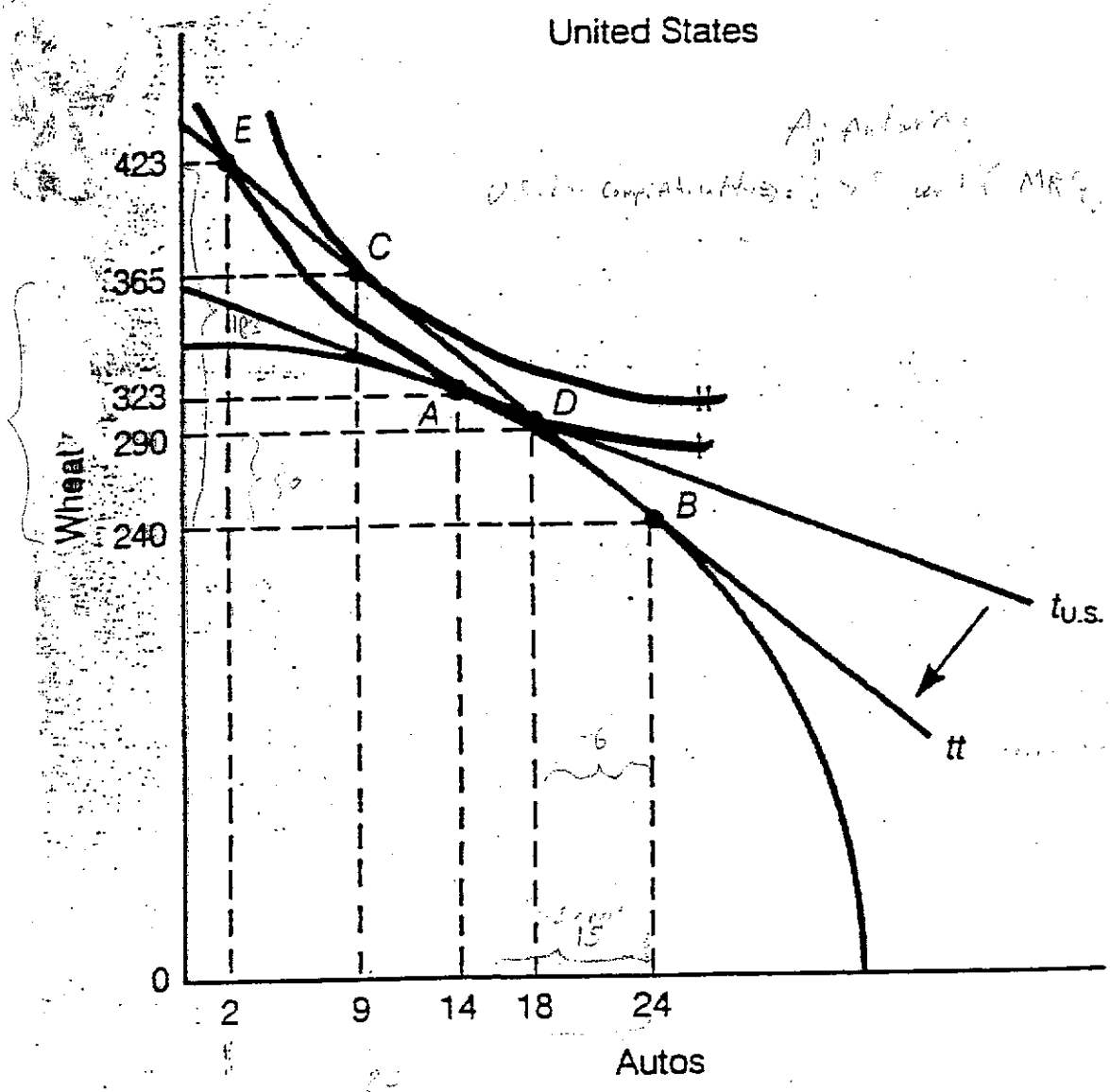


Figure 3.4 *Basis for trade, gains from trade.* A nation benefits from international trade if it can achieve a higher level of satisfaction (indifference curve) than it can attain in autarky. Maximum gains from trade occur at the point where the international terms-of-trade line is tangent to a community indifference curve.

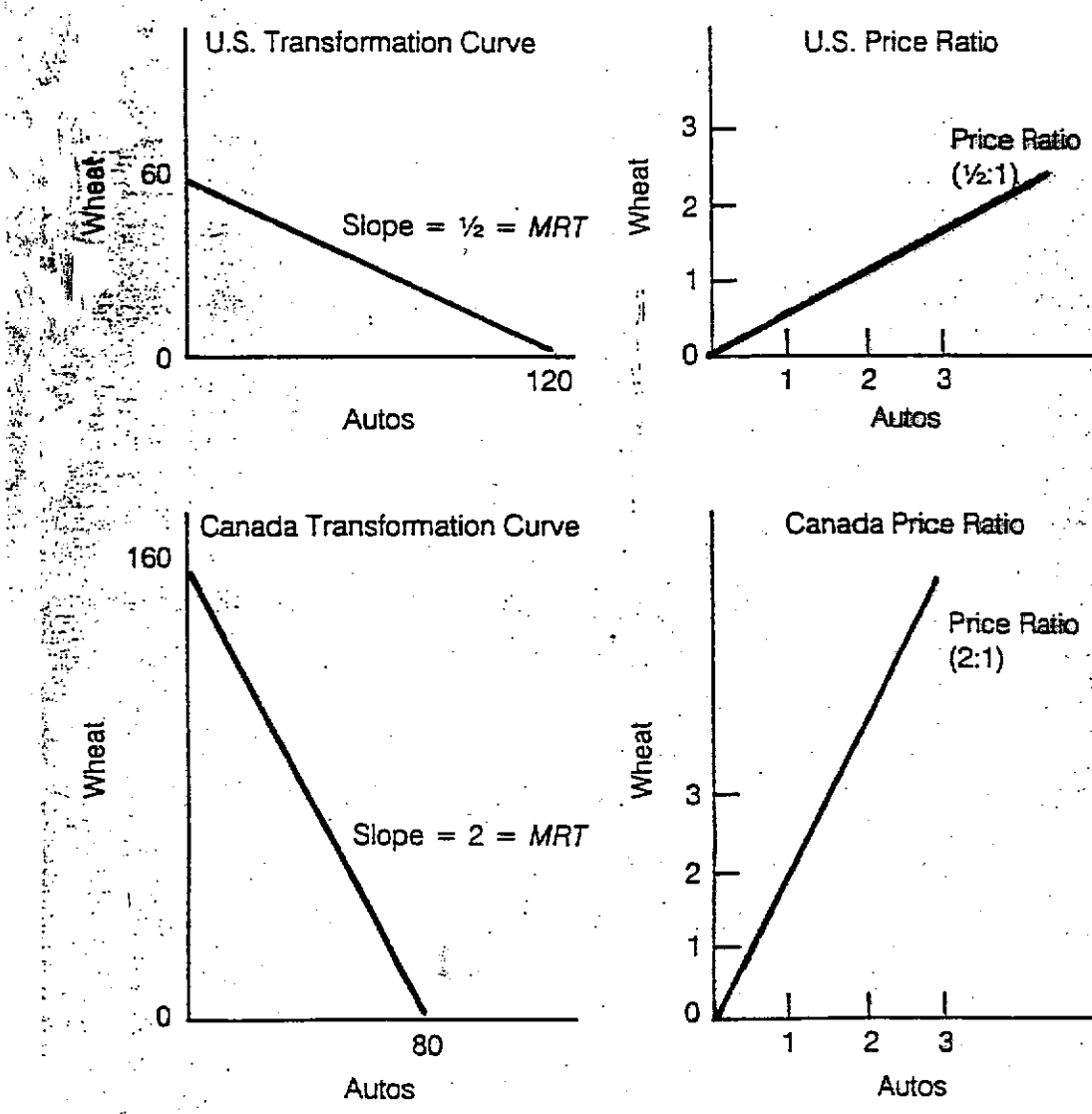


Figure 3.5 *Relative prices of autos and wheat: constant cost conditions.* The domestic cost ratio, indicated by the negatively sloped transformation schedule, can be translated into a positively sloped price-ratio line, which illustrates the outer limits for the equilibrium terms of trade.

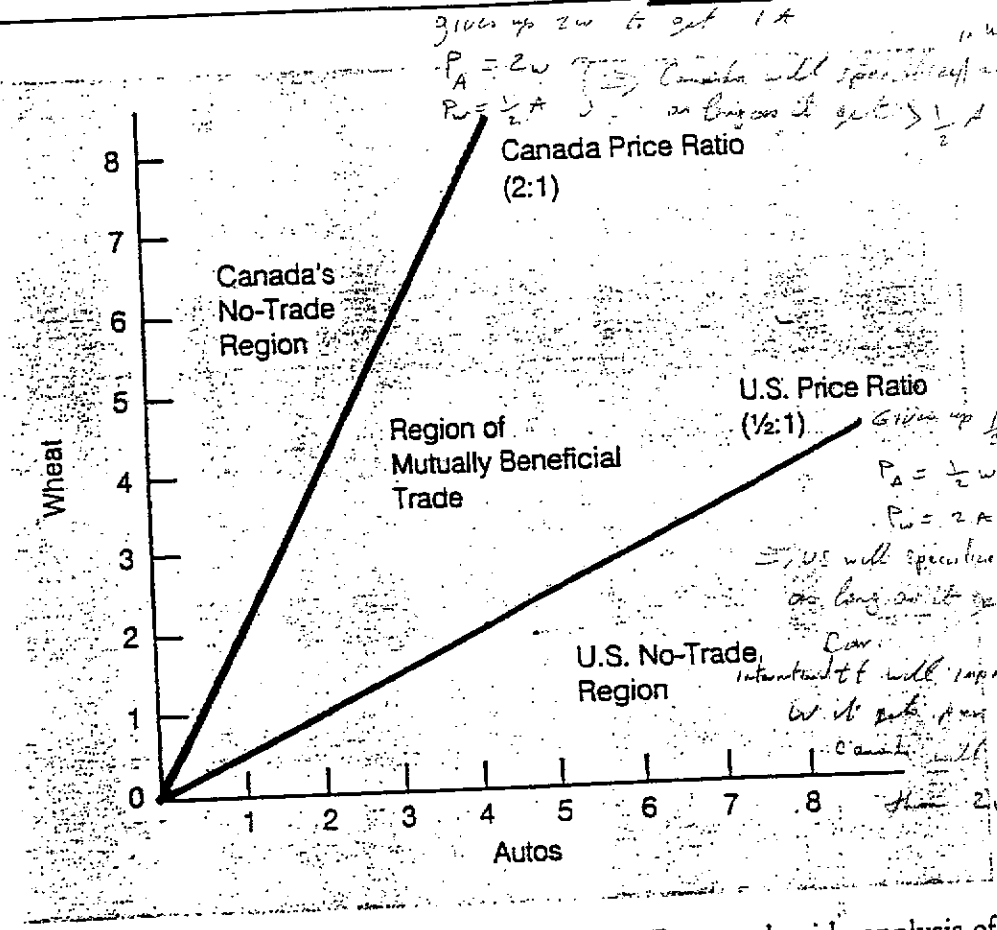


Figure 3.6 *Equilibrium terms-of-trade limits.* The supply-side analysis of Ricardo describes the outer limits within which the equilibrium terms of trade must fall. The domestic price ratios set the outer limits for the equilibrium terms of trade. Mutually beneficial trade for both countries occurs if the equilibrium terms of trade lies between each country's price ratio.

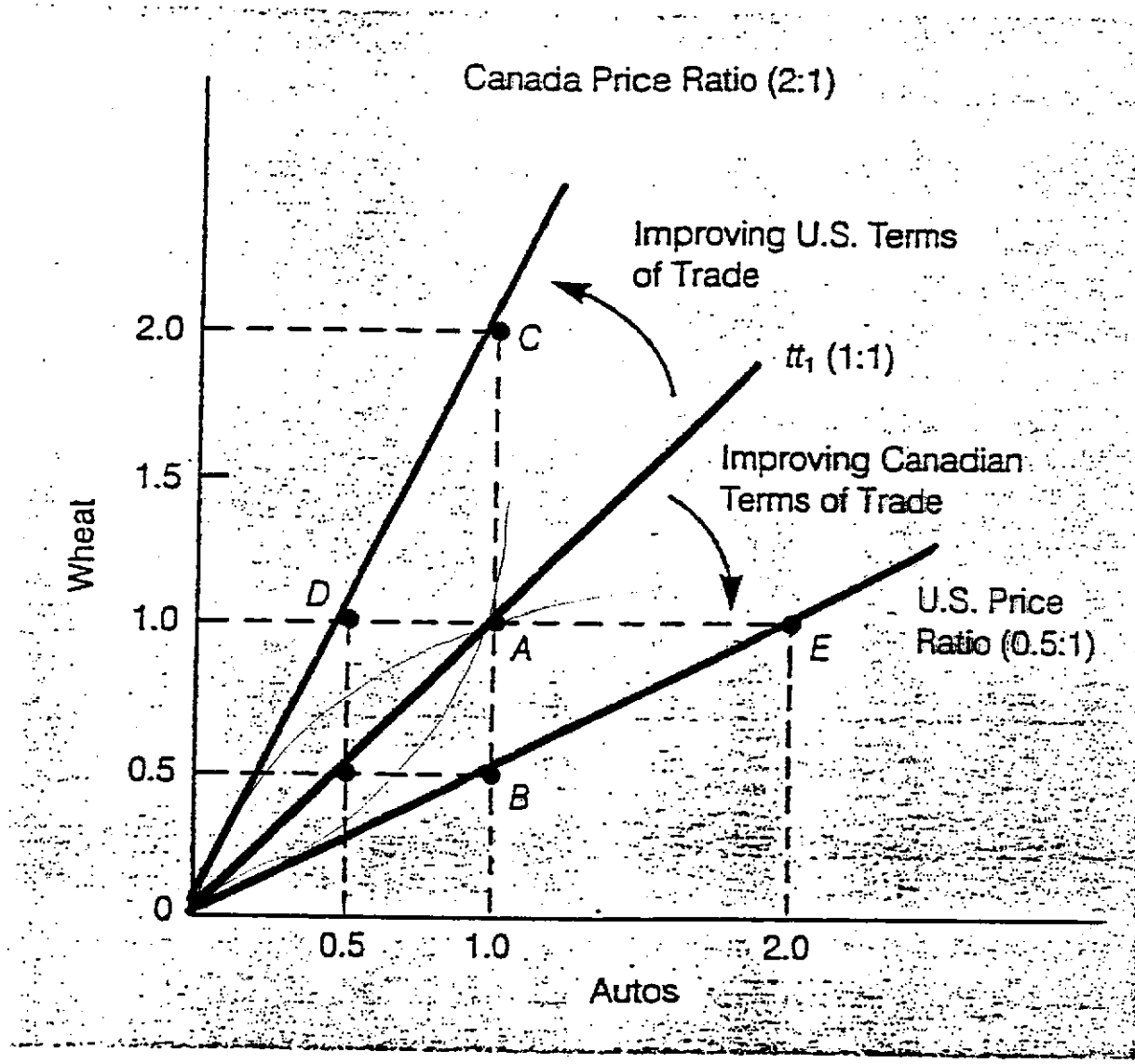


Figure 3.7 *Movements in the terms of trade.* According to the theory of reciprocal demand, the actual price at which trade occurs depends on the trading partners' interacting demands. The theory of reciprocal demand best applies when both trading partners are of equal economic size so that demand conditions in each country have a noticeable effect on the world price.

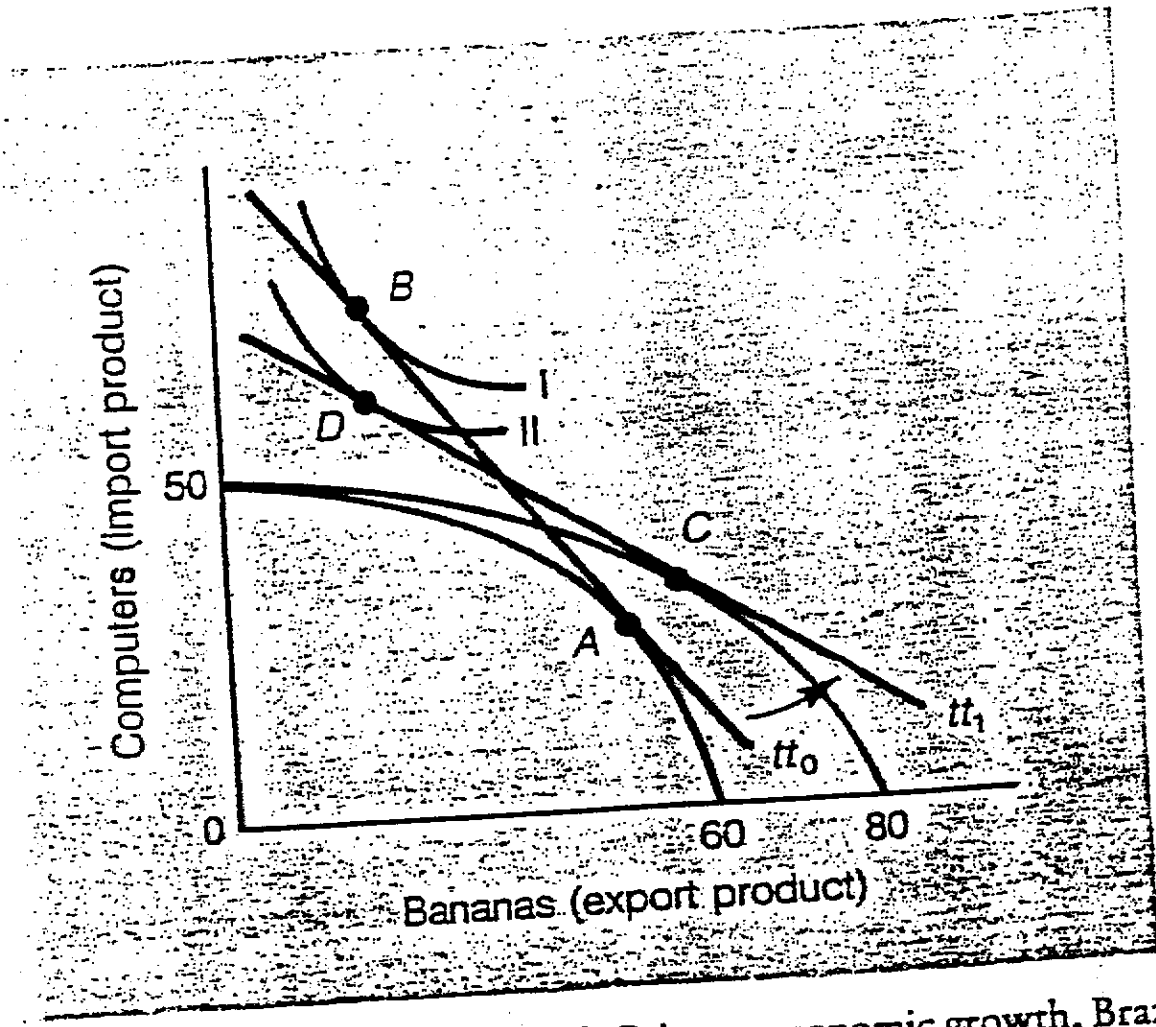


Figure 3.8 *Immiserizing growth.* Prior to economic growth, Brazil achieves a posttrade consumption point B along indifference curve I. Export-biased growth shifts out Brazil's transformation schedule; as drawn, the growth is biased toward bananas. If the resulting increased volume of trade substantially reduces Brazil's terms of trade, the country's posttrade consumption point D may end up on indifference curve II, which lies below indifference curve I.

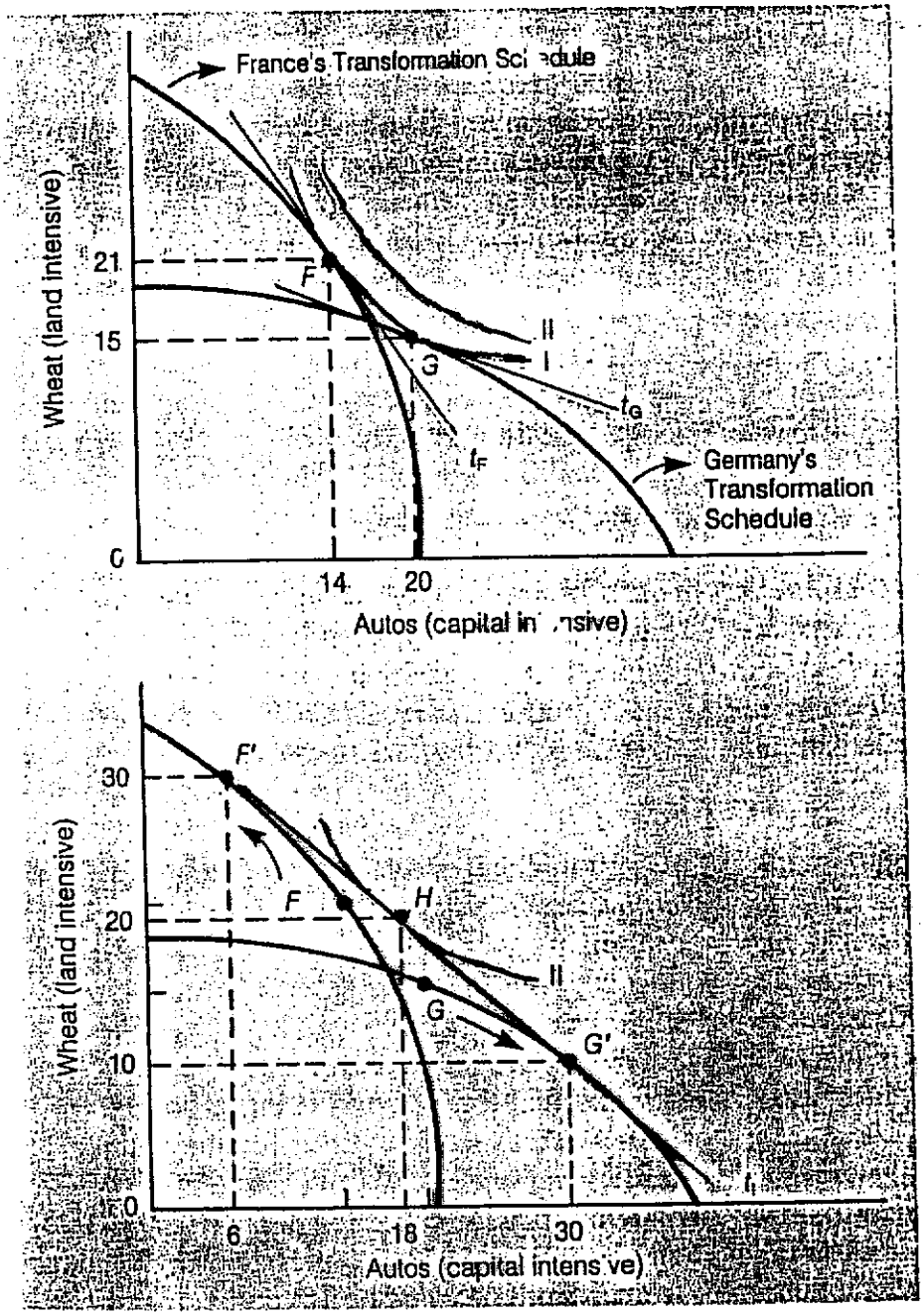


Figure 4.1 *Comparative advantage according to the factor endowment model.* The factor endowment model asserts that the pattern of trade is explained by differentials in resource endowments. A capital-abundant nation will have a comparative advantage in a capital-intensive product while a labor-abundant nation will have a comparative advantage in a labor-intensive product.

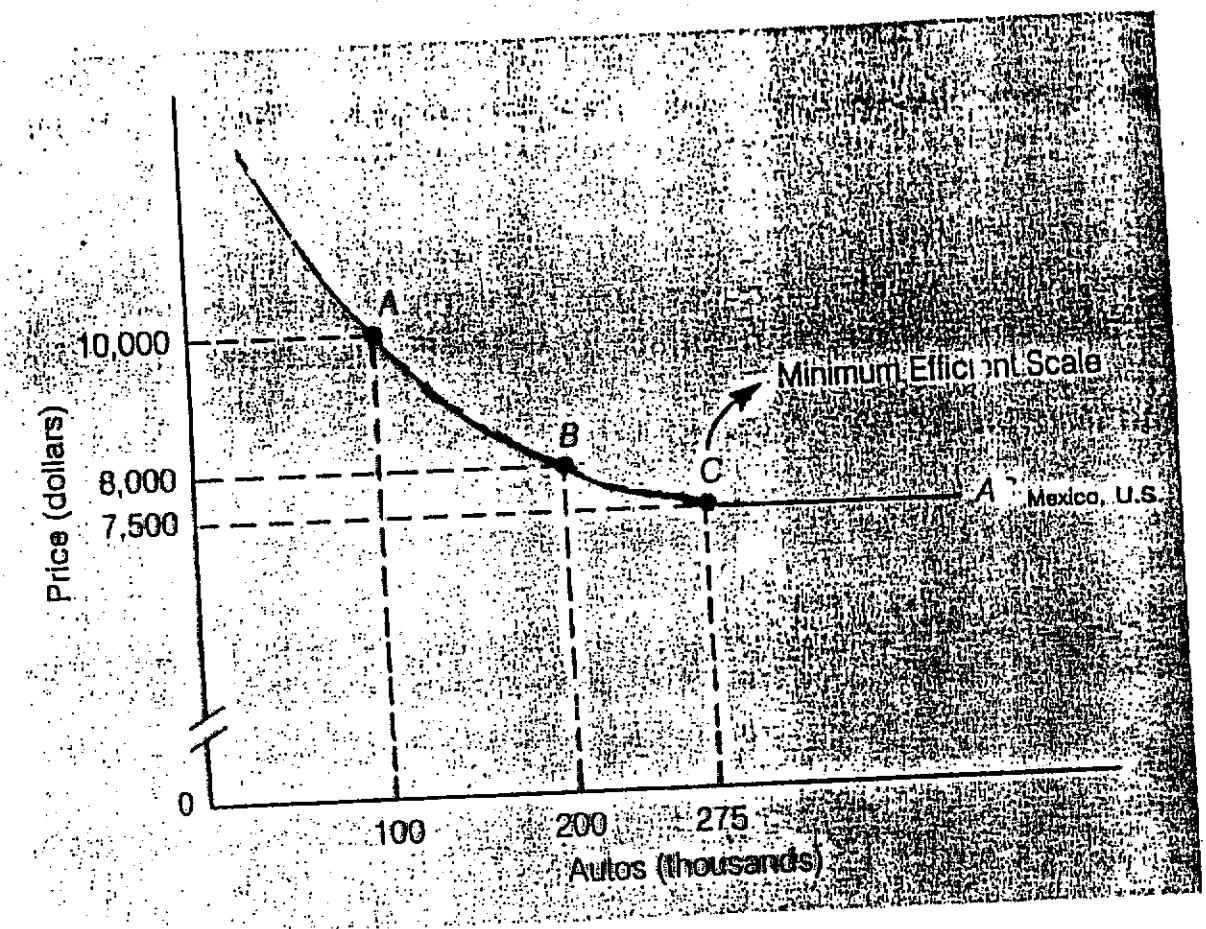


Figure 4.2 *Economies of scale as a basis for trade.* By adding to the size of the domestic market, international trade permits longer production runs by domestic firms, which can lead to greater efficiency and reductions in unit costs.

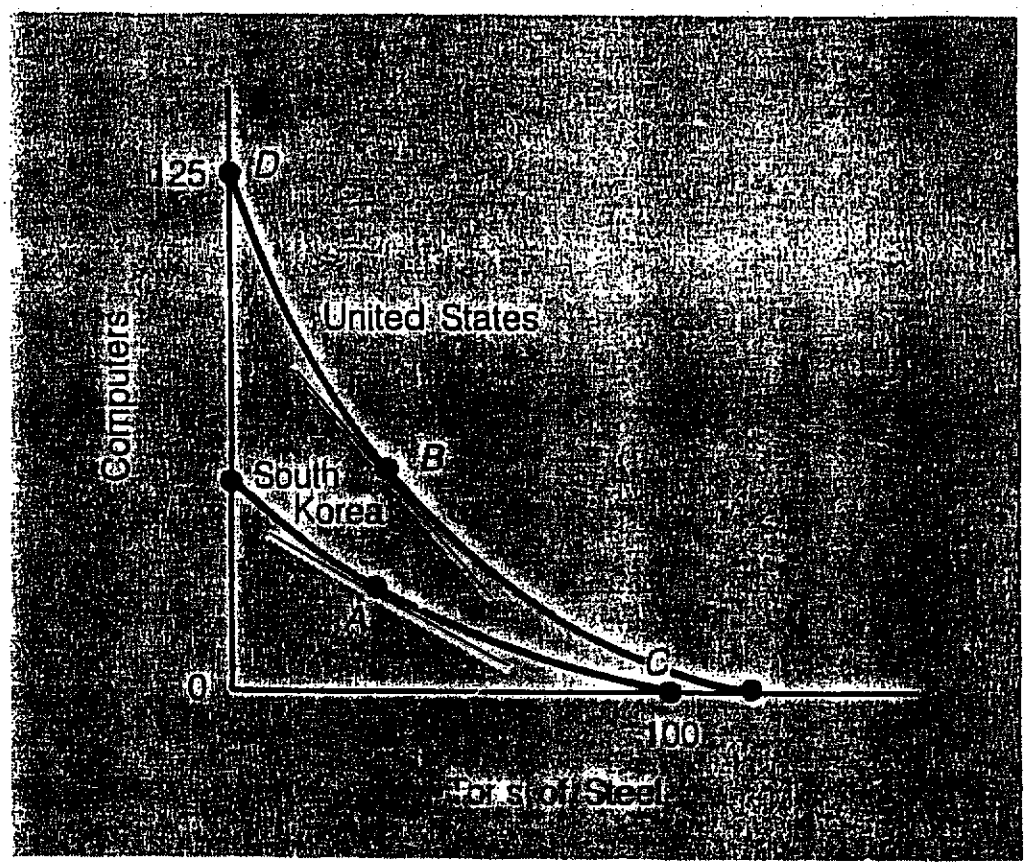
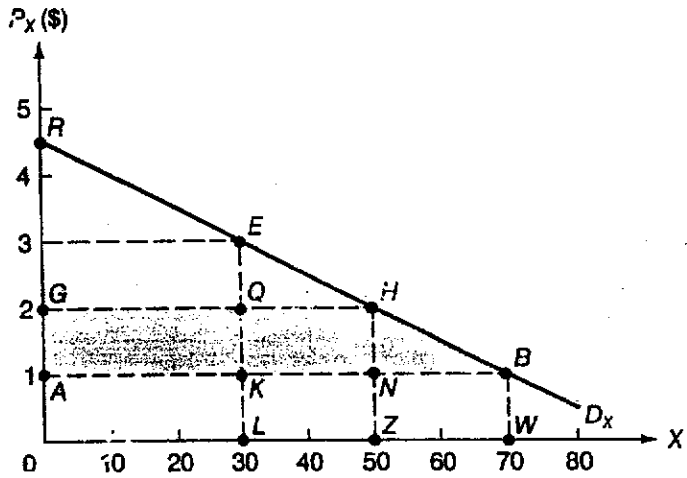


Figure 4.3 *Trade and specialization under decreasing costs (economies of scale).* With decreasing costs, a country has the cost incentive to completely specialize in the product of its comparative advantage. Devoting additional resources to steel (computer) production results in economies of large-scale production and falling unit cost. With specialization, South Korea produces 100 tons of steel at point C, while the United States produces 125 computers at point *D*.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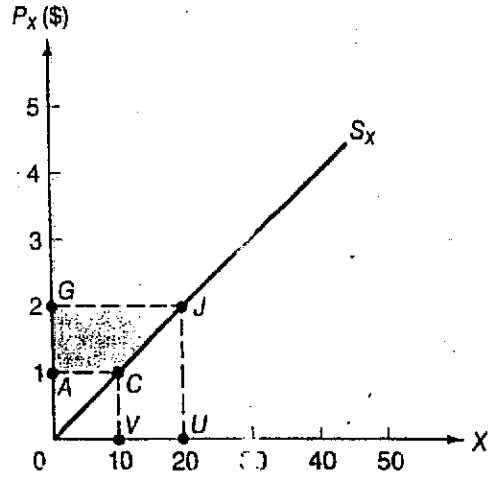
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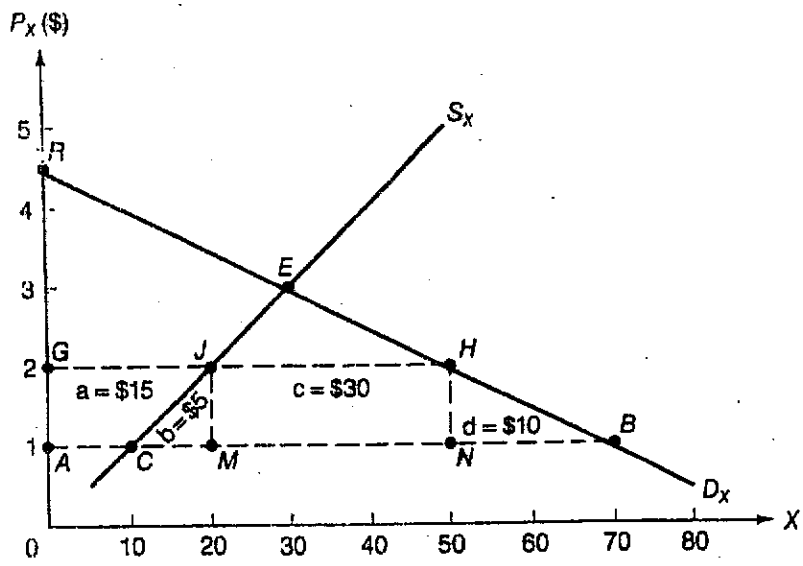
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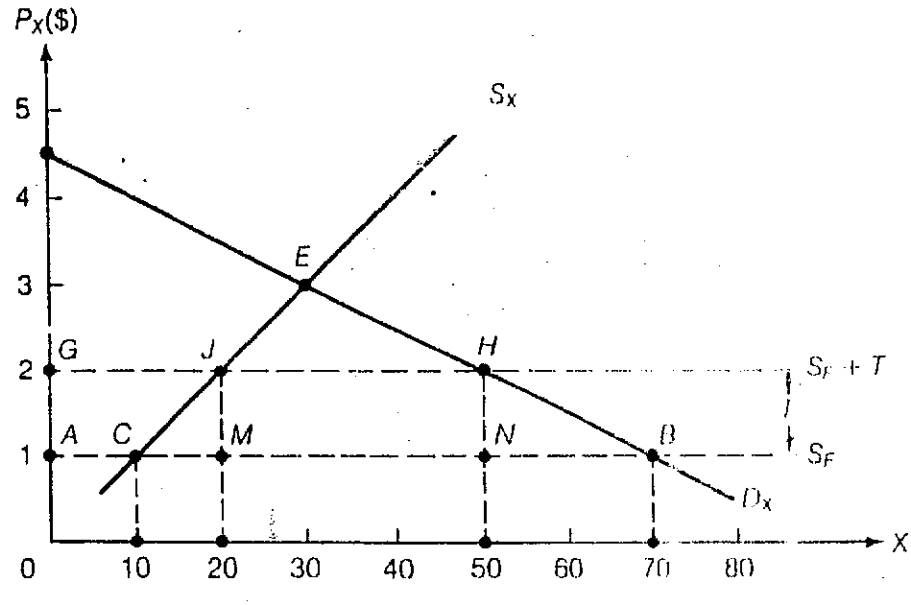
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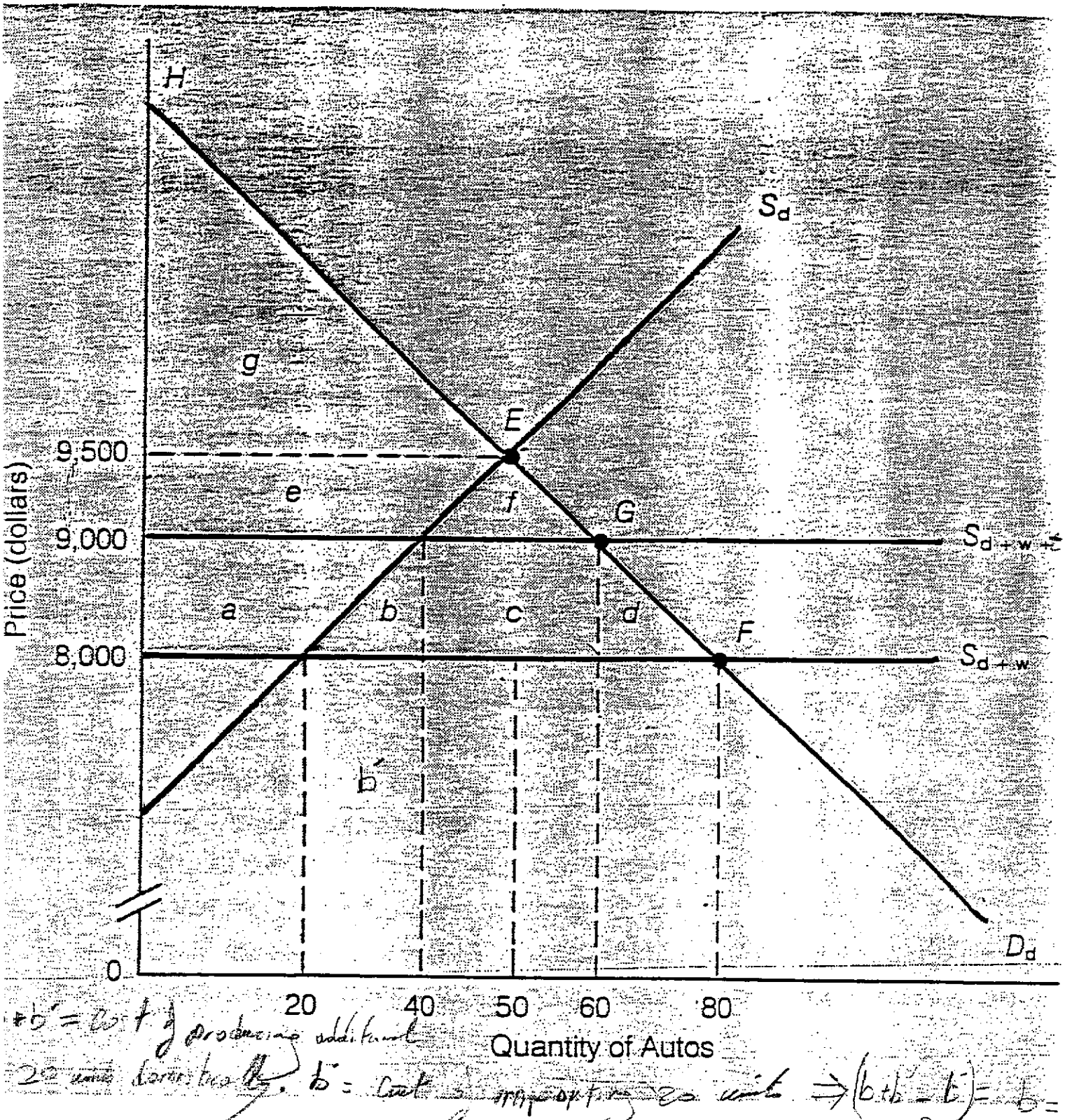
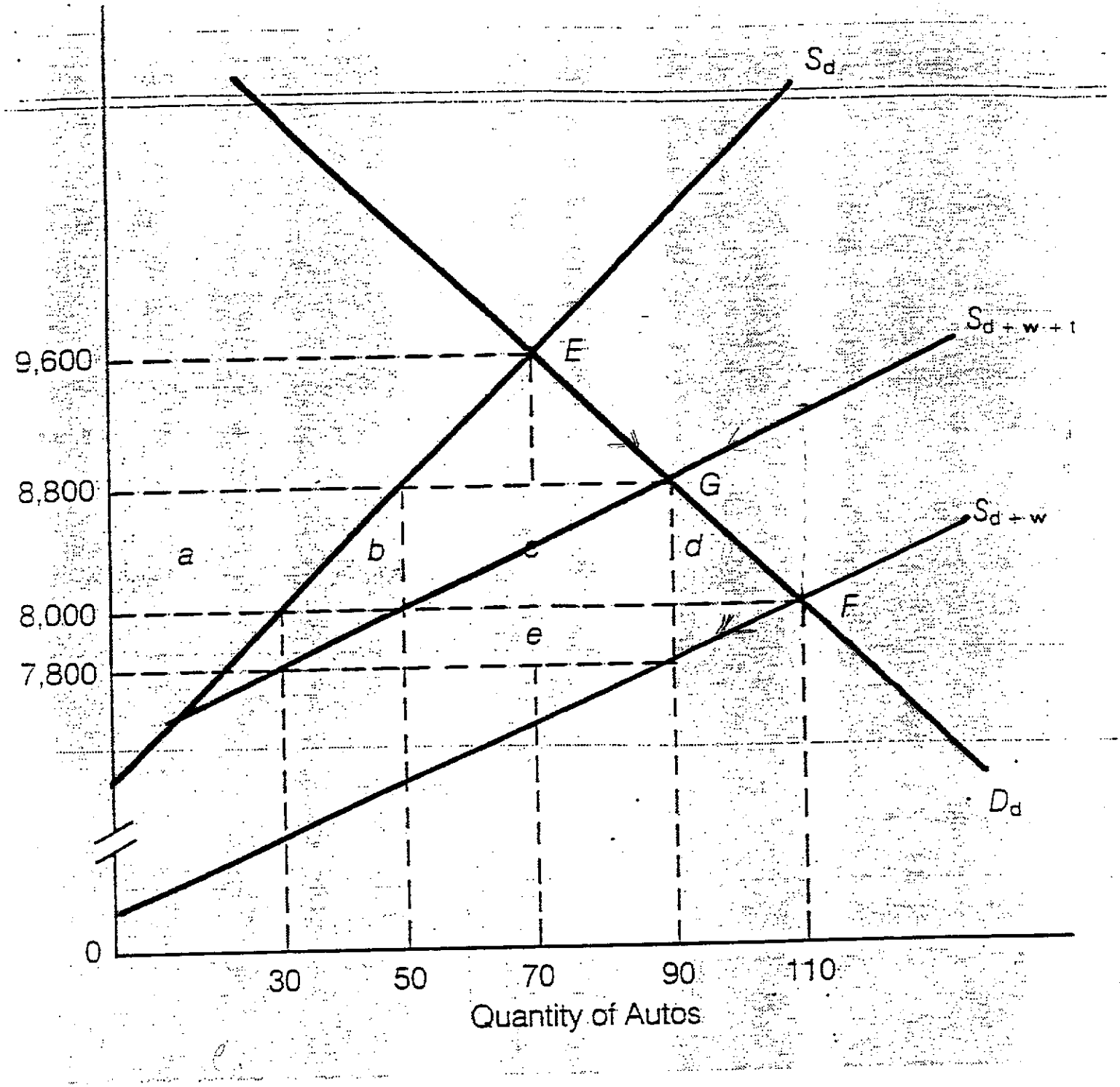


ure 5.1 *Tariff trade and welfare effects: small-nation model.* For a ll nation, a tariff placed on an imported product is shifted totally to omestic consumer via a higher product price. Consumer surplus falls to the price increase. Of this amount, the small nation's welfare de- ses by an amount equal to the protective effect and consumption t, the so-called deadweight losses due to a tariff.



e 5.2 *Tariff trade and welfare effects: large-nation model.* For a ıation, a tariff on an imported product may be partially shifted to mestic consumer via a higher product price and partially absorbed foreign exporter via a lower export price. The extent by which a s absorbed by the foreign exporter constitutes a welfare gain for the ɔuntry. This gain offsets some (all) of the deadweight welfare losses the tariff's consumption effect and protective effect.

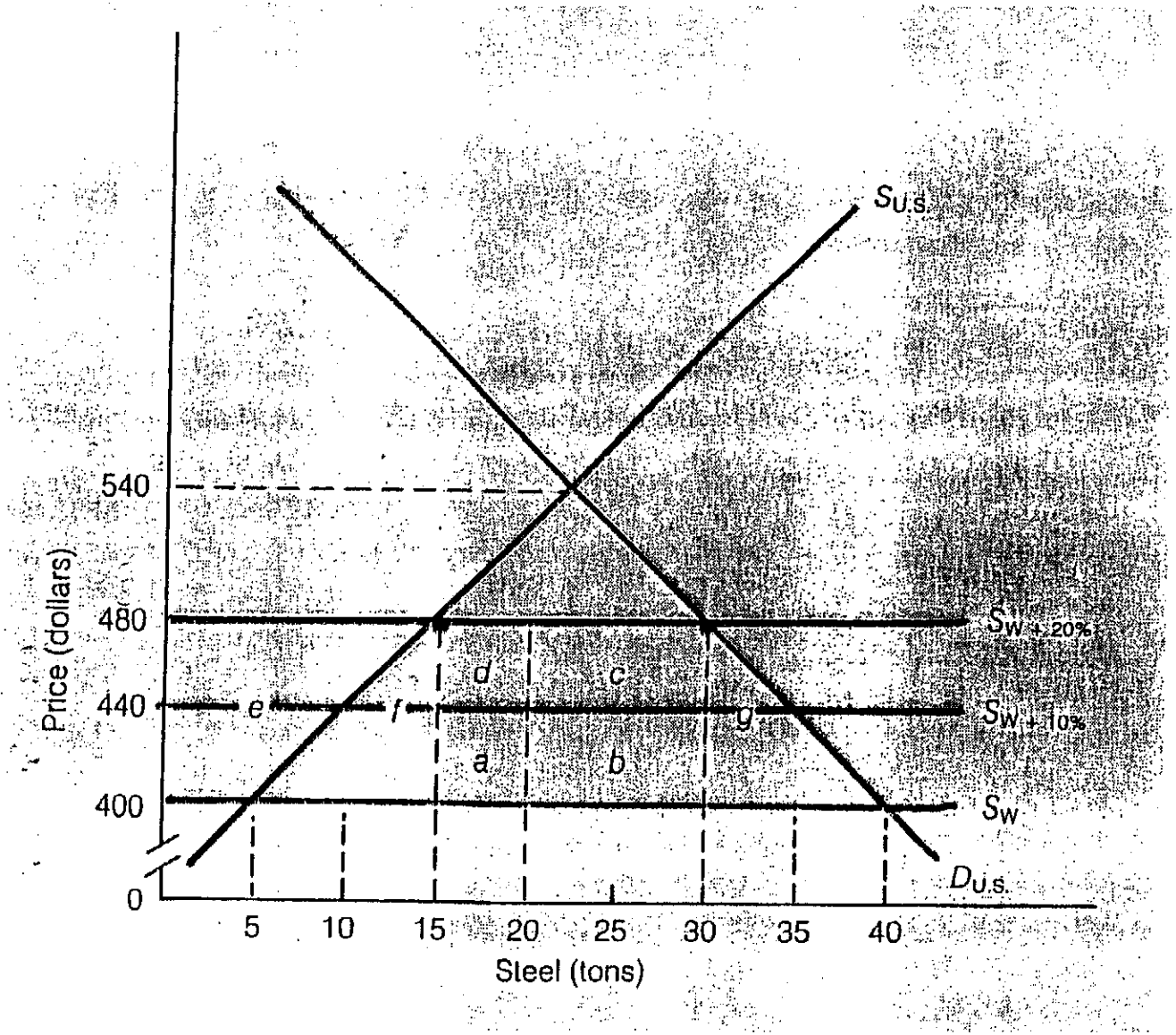


Figure 5.3 *Tariff quota trade and welfare effects.* A tariff quota is a two-tier tariff levied on imports. Its imposition leads to a higher product prices and a decrease in consumer surplus for domestic buyers. Concerning the tariff quota's revenue effect, a portion of it accrues to the domestic government, while the remainder is captured by domestic importers or foreign exporters as windfall profits.

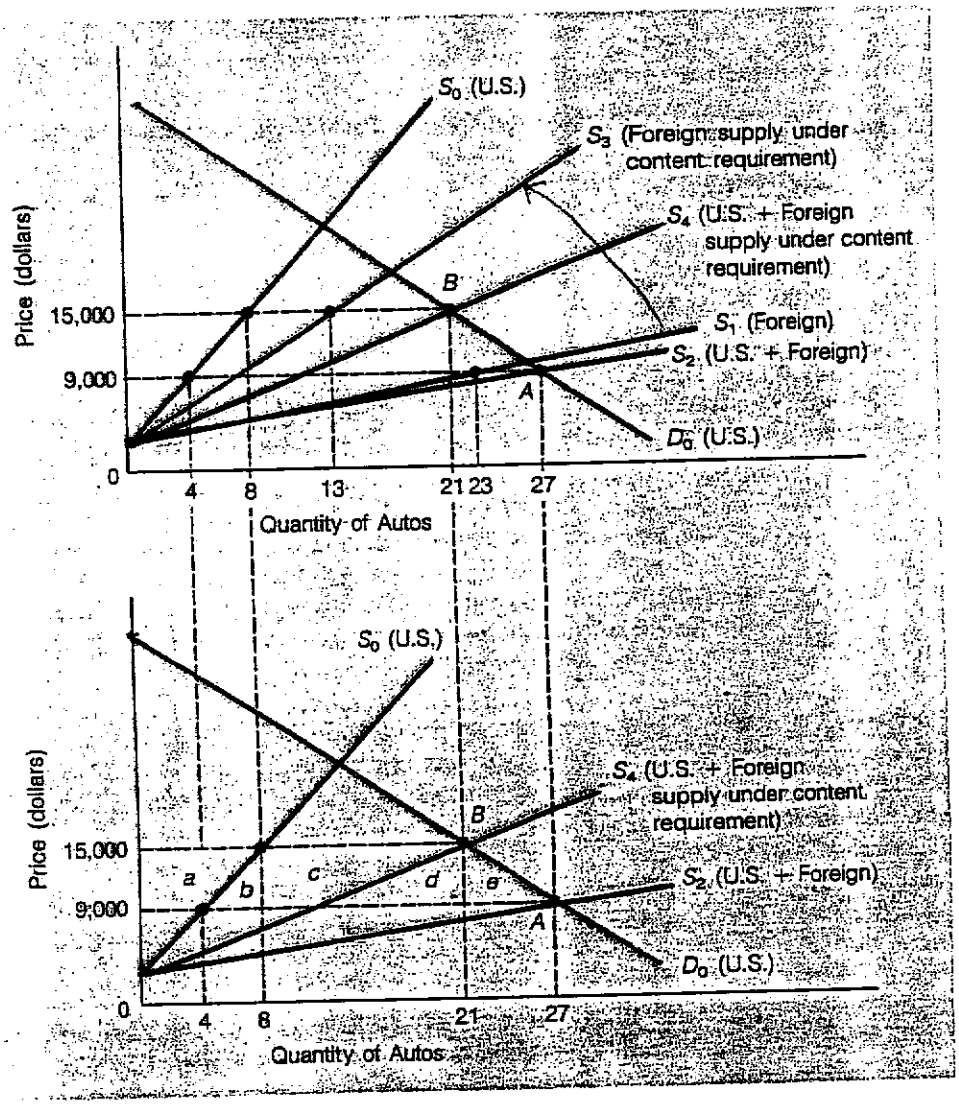


Figure 6.4 *Welfare effects of domestic content requirement.* A domestic content requirement leads to rising production costs and prices to the extent that manufacturers are "forced" to locate production facilities in a high-cost nation. Although the content requirement helps preserve domestic jobs, it imposes welfare losses on domestic consumers.

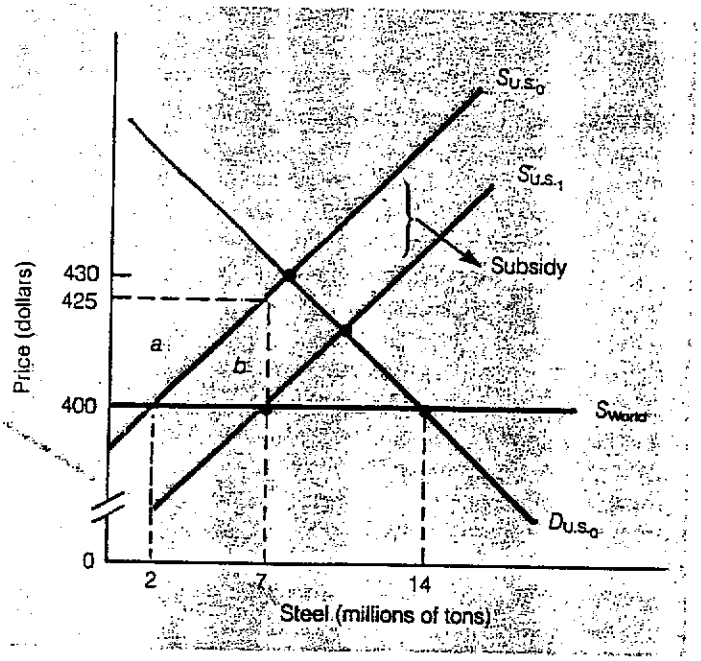


Figure 6.5 *Economic effects of a domestic subsidy.* A government subsidy granted to import-competing producers leads to increased domestic production and reduced imports. The subsidy revenue accruing to the producer is absorbed by producer surplus and high-cost production (protective effect). The subsidy imposes a deadweight welfare loss on the domestic economy equal to the protective effect.

price of $400 per ton. Given a free trade price of $400 per ton, the United States consumes 14 tons of steel, producing 2 tons and importing 12 tons.

To partially insulate domestic production from foreign production, suppose the U.S. government grants a subsidy of $25 per ton for steel produced by its import-competing steelmakers. The cost advantage made possible by the subsidy results in the U.S. supply schedule shifting right from $S_{U.S._0}$ to $S_{U.S._1}$. Domestic production expands from 2 to 7 million tons, and imports fall from 12 to 7 million tons. These changes represent the subsidy's trade effect.

The subsidy to import-competing companies also affects the national welfare of the United States. According to Figure 6.5, the subsidy permits U.S. output to rise to 7 million tons. Note that, at this output, the net price of the steelmaker equals $425—the sum of the price paid by the consumer ($400) plus the subsidy ($25). To the U.S. government, the total cost of protecting its steelmakers equals the amount of the subsidy ($25) times the amount of output to which it is applied (7 million tons)—an amount equal to $175 million.

Where does this subsidy revenue go? Part of it is redistributed to the more efficient U.S. producers in the form of *producer surplus*. This amount is denoted by area *a* in the figure. There

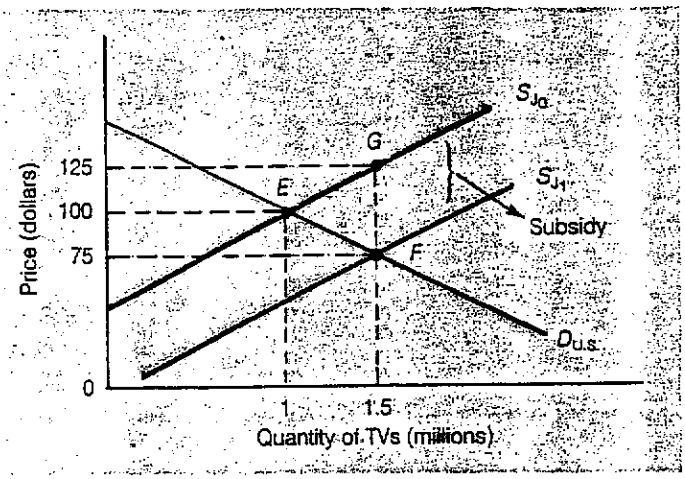


Figure 6.6 *Economic effects of an export subsidy.* To improve the competitiveness of domestic exporters, governments grant subsidies such as tax breaks and export credit subsidies. These cost reductions lead to an exporter's supply schedule shifting outward to the right and result in two effects: terms-of-trade effect and export revenue effect.

tion suffer as the international terms of trade moves against them. This is because, given a fall in export prices, a greater number of exports must be made for a given dollar amount in imports. Domestic consumers also find they must pay higher prices than foreigners for the goods they help subsidize. Furthermore, to the extent that taxes are required to finance the export subsidy, domestic consumers find themselves poorer. In the previous example, the cost of the subsidy to the Japanese taxpayers totals $75 million ($50 subsidy times 1.5 million TVs).

One type of export subsidy that has become increasingly controversial in recent years is the *export credit subsidy*. To encourage exporting by domestic producers, governments frequently extend loans to foreign customers. These loans often are awarded when private banks are unwilling to grant credit to importing businesses viewed as high risk. The interest rates charged on export credits traditionally have been less than those demanded by private banks on similar loans. Export credit subsidies transfer money from the domestic taxpayer to the subsidized export industry, the foreign purchaser, or both.

Export subsidies have been justified on a number of grounds. To the extent that credit subsidies lead to increased exports, the home nation's balance of trade is strengthened. Rising exports also result in higher levels of domestic employment. Credit subsidies thus are often viewed as a relatively cheap alternative to unemployment and welfare payments. Credit subsidies have helped industries increase their scales of production and overcome inefficiencies or other presumed disadvantages. They have been used to encourage industrial sectors favored by the government. Finally, credit subsidies have been viewed as a kind of foreign aid because they help ease the debt burdens of the recipient developing nations.

To prevent nations from attaining unfair com-

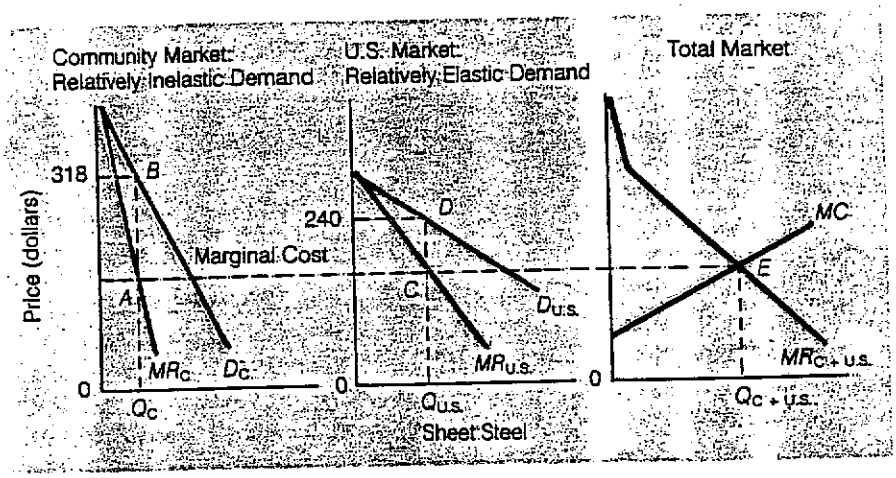


Figure 6.7 *International price discrimination.* A business practicing international price discrimination will charge a lower price in the more elastic market and a higher price in the less elastic market. Successful price discrimination increases a business's sales revenue and profits.

which marginal revenue equals marginal cost. A profit-maximizing producer faces the problem of how to distribute total output $Q_{C+U.S.}$, and thus set price, in the two submarkets in which it sells. To accomplish this, the producer follows the familiar $MR = MC$ principle, whereby the marginal revenue of each submarket equals the marginal cost at the profit-maximizing value. This can be shown in Figure 6.7 by first constructing a horizontal line from the point where $MC = MR_{C+U.S.}$. The optimal output in each market is then found where this horizontal line intersects the MR schedules of the two submarkets. The producer will therefore sell Q_C output in the domestic market at the price \$318. It will sell the remaining $Q_{U.S.}$ units in the foreign market at the price \$240. International price discrimination results in the higher price, \$318, charged in the more inelastic (domestic) market and the lower price, \$240, in the more elastic (foreign) market.

For **international price discrimination** to be successful, certain conditions must hold. First, to ensure that at any price the demand schedules in the two markets have *different demand elasticities*, the markets' demand conditions must differ. Domestic buyers may, for example, have income levels or tastes and preferences that differ from those of buyers abroad. Second, the monopolist must be able to separate the two markets, preventing any significant resale of commodities from the lower-priced to the higher-priced market. This is because any resale by consumers will tend to neutralize the effect of differential prices and narrow the discriminatory price structure to the point at which it approaches a uniform price to all consumers. Because of high transportation costs and government trade restrictions, markets are often easier to separate internationally than nationally.

Excess Capacity

One of the major reasons behind sporadic or distress dumping is that producers sometimes face reductions in demand that leave them with