

International trade and industrialization strategies

TAKE-HOME MESSAGES FOR CHAPTER 7

1. Comparative advantage in trade can originate in country differences in resource endowments, in ways of organizing production, and/or in policies. Trade based on comparative advantage is a source of static and dynamic efficiency gains for participating countries that are enhanced by specialization. Trade should thus be good for growth, even though empirical results show a great deal of heterogeneity in impact associated with the presence of complementary policies.
2. The benefits from trade are unequally distributed across participating countries and between producers, consumers, and government, with both winners and losers. As a consequence, any move toward trade liberalization is a controversial political proposition, and aggregate efficiency gains may be lost to concerns about distribution.
3. The domestic price of a tradable good is affected by both trade and exchange-rate policies. Trade indicators characterize nominal, effective, and real protection. Taxation of agricultural exportables, that used to be quite high in developing countries in the early 1980s, has declined substantially over the last 25 years.
4. Latecomer countries can achieve international competitiveness when there are economies of scale in production through import-substitution industrialization (ISI), export-oriented industrialization (EOI), and open-economy industrialization (OEI) policies, each with their own particular conditions for success. Careful choice of an industrialization strategy is thus a key component of development policy.
5. The impact of trade liberalization on poverty reduction is ambiguous. In the short run, trade affects the prices of products and factors, and whether the poor benefit or not from these changes depends on which sectors they produce in and which products they consume. In the longer run, the impact on poverty is through the reallocation of labor across sectors as countries specialize and trade. In some cases, labor-productivity gains may be associated with labor-saving technological change and demand for higher labor skills, with no resulting gains in the labor earnings of the poor.
6. When there are environmental costs in production that are not internalized in private costs, trade opening creates gains from both trade and environmental effects. For an importing country with no environmental regulation, imports help reduce

domestic pollution. For an unregulated exporting country, trade creates net social gains but also large environmental costs. Because the unregulated exporting country acquires unfair trade advantages and can serve as a pollution haven for the world, industrialized countries demand the harmonization of environmental standards across trading countries. This is in turn problematic as the developing countries could have the right to focus on growth while postponing environmental controls, in the same way as the now industrialized countries did.

We explore in this chapter the role of trade in development strategies. To do this, we need to first understand why countries trade, who gains and loses from trade, what the policy instruments are that can be used to promote trade, and how trade affects both efficiency in the use of resources and the distribution of income. We then analyze how trade instruments can be used to design industrialization strategies, each of which has particular advantages and risks.

TRADE OPENNESS

A key aspect of the process of globalization has been the rapid rise in the importance of trade in GDP. Trade openness for country i in year t is measured as the share of trade in GDP, namely:

$$(X_t + M_t) / GDP_t,$$

where X is exports and M imports. The role of exports in creating effective demand for GDP can also be measured as the share of exports in GDP. Figure 7.1 shows that trade openness increased from 1967 to 2013 in all regions, indicating that trade (Figure 7.1a) and exports (Figure 7.1b) have grown faster than GDP. It shows, too, that it is in middle-income countries that the rise of trade openness and of the share of exports in GDP have been greatest. Until 1985, it was high-income OECD countries that were the most export-oriented, with exports accounting for 18 percent of GDP. After 1985, the share of exports in GDP became highest in middle-income countries, reaching 34 percent in 2006, before the shocks of the food and financial crises brought it down to 27 percent in 2009, rising again to 30 percent in 2012. In low-income countries, the importance of trade has also increased, keeping pace with growth of trade in the OECD countries, particularly in the last two decades.

Growth in exports has been spectacular in many middle-income countries. In China, exports grew by 18 percent/year between 1992 and 2008, and in India by 14 percent. They grew by more than 8 percent annually in Brazil, Korea, Mexico, Argentina, Indonesia, South Africa, Thailand, Egypt, Colombia, Malaysia, the Philippines, and Chile. Trade that was dominated by flows among high-income countries in the 1980s (accounting for 80 percent of all trade in 1985) is now dominated

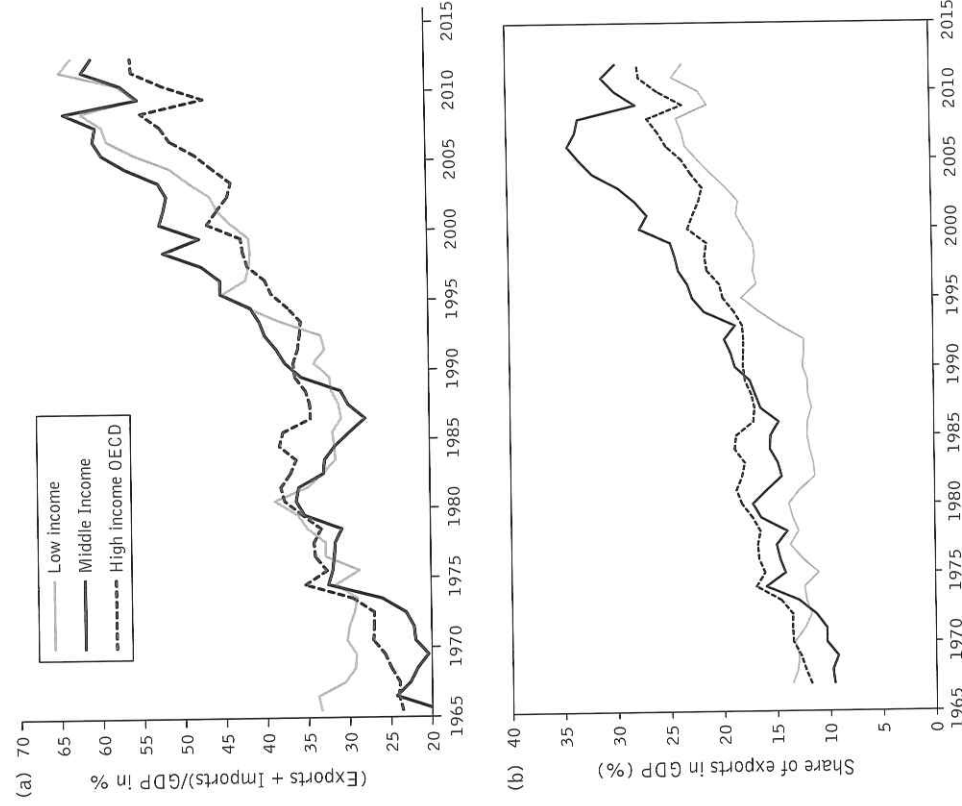


Figure 7.1 Trade openness (a) and share of exports in GDP (b) by country category, 1967-2012

Source: World Bank, *World Development Indicators*.

by North-South, South-North, and South-South trade. The share of exports from low-income countries to other low-income and middle-income countries rose from 24 percent in 1994 to 42 percent in 2008.

Today, China accounts for 20 percent of all manufactured goods imported by the US, mainly labor-intensive products, contributing to the decline in the price of many consumer goods. This share exceeds 30 percent in apparel, textiles, furniture, leather goods, electrical appliances, and jewelry. This has created gains for consumers, but at the cost of employment losses and declining wages in sectors competing with Chinese imports, as we will see later in the Autor *et al.* (2013) study of the “China syndrome.”

Sachs and Warner (1995) constructed a dummy variable (i.e. a variable only taking the values of 0 and 1) for openness based on five individual dummies for specific

trade-related policies. A country was classified as open if it did not display any of the following characteristics:

1. Average tariff rates of 40 percent or more.
2. Non-tariff barriers covering 40 percent or more of trade.
3. A black-market exchange rate lower by 20 percent or more than the official exchange rate.
4. A state monopoly on major exports.
5. A centrally planned socialist economic system.

This index was measured by Wacziarg and Welch (2008) for 141 countries over the period 1960 to 2000. Results in Figure 7.2 show that there was a major increase in trade openness starting in 1985. In 2000, 73 percent of the countries in the world, representing 47 percent of world population, were open to international trade. The authors relate the timing of being open (which they call trade liberalization) to indicators of economic performance such as trade openness, physical-capital investment, and growth in GDPpc, contrasting their levels before and after liberalization. They find that, on average across all countries, trade liberalization was associated with large increases in these indicators, concluding that trade liberalization does indeed matter for economic performance.

Previously non-traded services have seen a recent sharp increase in trade. These include banking, insurance, telecommunications, retailing, transportation, and professional services such as accounting, auditing, and international law. Borchert et al. (2014) show that trade in services remains restricted, however, and that restrictive trade policies are detrimental to investment flows in services and to trade in services. In particular, restrictions on foreign acquisitions, discrimination in licensing,

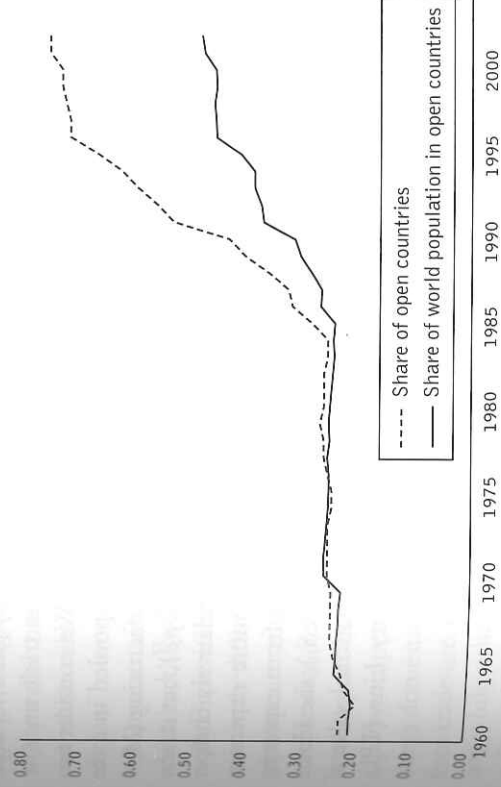


Figure 7.2 Trade openness according to the Sachs and Warner criterion, 141 countries

Source: Wacziarg and Welch, 2008.

restrictions on the repatriation of earnings, and lack of legal recourse all have a significant and sizable negative effect on the expected value of sectoral foreign investment into service sectors.

In India, trade liberalization came rapidly in the context of the 1991 balance-of-payments crisis and imposition by the IMF of conditionalities attached to structural-adjustment loans that mandated trade liberalization. This sudden exogenous trade-policy shock was analyzed by Topalova and Khandelwal (2011) to measure how reductions in trade protection induced higher levels of productivity in manufacturing firms. They found that tariff reductions increased competition and caused firms to increase their efficiency. Reduced import tariffs provided firms with more and cheaper access to imported inputs. Increased competition and access to modern inputs boosted firm-level productivity, particularly in import-competing industries, in industries not subject to excessive domestic regulation, and among domestic firms. Their study was thus able to exploit an exogenous trade shock as an events analysis to establish a causal link between trade liberalization and firm productivity.

GAINS FROM TRADE: WHY COUNTRIES TRADE, BUT NOT EVERYONE GAINS

When prices differ between countries by more than transaction costs, private traders can profit from exporting and importing. While this is the most basic impetus for trade, there is a more universal argument for international specialization based on aggregate efficiency. In principle, the world as a whole could benefit if each country specialized according to its relative efficiency, subject to the assumptions from the microeconomic theory of perfect competition. Just like Adam Smith's argument for microeconomic specialization in using the market to exchange, there could be aggregate benefits to an international division of labor and trade if this arises from real differences in efficiency.

While there are many practical obstacles to realizing such efficiency gains, let alone distributing its benefits, it is worth examining the potential gain from trade since we see many examples of trade-induced prosperity around the world. We consider two economic units: the Home economy (H) and all other countries pooled into the Rest of the World (W). We consider two goods: Food (F) and manufacturing (M).

The Home economy in Figure 7.3 has its own autarky prices (p_M^H, p_F^H), but it faces world prices (p_M^W, p_F^W) for both goods. The domestic price of M is relatively cheaper than in the world market, and the domestic price of F relatively more expensive. Think of China as an illustration. With trade, the country could gain from exporting M and importing F . From its initial domestic production point (S_M, S_F), the Home country then has an implied budget set determined by the international value of its output. This is depicted by what is called the Trading Possibility Line (TPL), defined by:

$$\text{TPL} : p_M^W M + p_F^W F = p_M^W S_M^H + p_F^W S_F^H = Y^H$$

where Y^H denotes national income at world prices. Thus Home can “purchase” any combination of goods (M, F) satisfying the national income-constraint TPL.

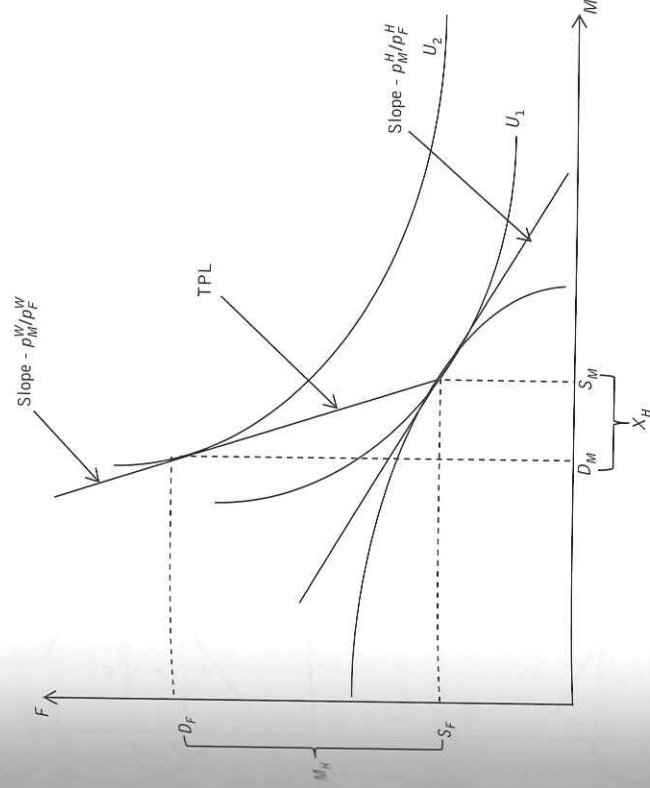


Figure 7.3 Static gains from trade for the Home economy

According to the example, its optimal choice would be (D_M, D_F) , which achieves higher utility $(U_2 > U_1)$ than the initial autarky point (S_M, S_F) . To reach this point, Home must export Manufactures in the amount $X_H = S_M^H - D_M^H$ and import Food in the amount $M_H = D_F^H - S_F^H$. By following comparative advantage, this country's consumption possibilities can extend beyond its production possibilities, achieving higher national utility by engaging in trade.

A parallel narrative can be developed for the Rest of the World, which plays a symmetric role in this simplified two-country story. As intuition would dictate, this block of countries can gain by exporting the food needed by Home and importing its Manufactures. In the process of reconciling these two pairs of demand and supply schedules, the world relative prices are achieved and trade is in equilibrium.

By these relatively simple mechanisms, goods and services move between countries with differing comparative advantages. Within the countries, however, other adjustments can take place. In particular, countries can be expected to exploit comparative advantage further by specializing: namely, by moving resources away from import-competing sectors (with falling relative price under trade) to expand export-competing ones (with rising relative price under trade). Of course, this brings domestic stakeholder groups into at least partial conflict, indicating that gains from trade are not equally distributed as some sectors expand with trade liberalization while others contract.

Specialization to derive further benefits from trade is illustrated in Figure 7.4. Home further exploits its comparative advantage by expanding the production of Manufactures (which increases from S_M^1 to S_M^2) at the expense of domestic Food

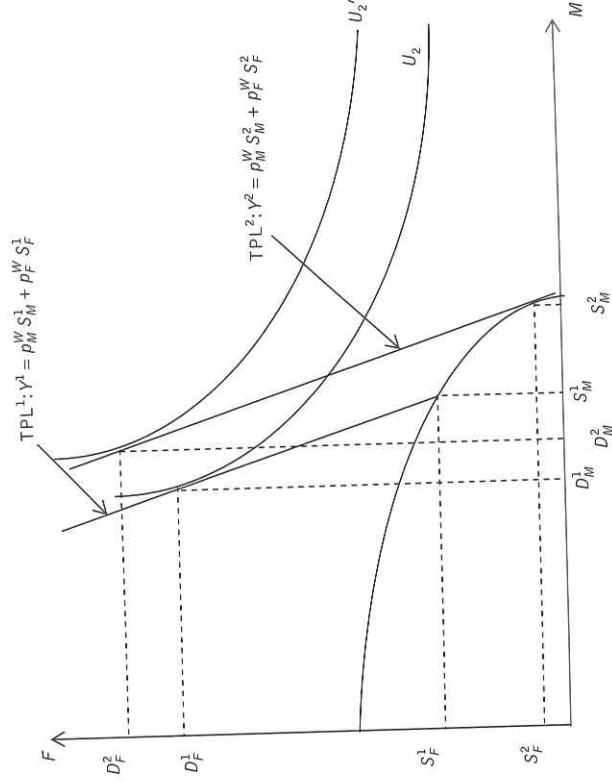


Figure 7.4 Further gains from specialization

production (which falls from S_F^1 to S_F^2). This process directly increases national income, from $Y^1 = p_M^W S_M^1 + p_F^W S_F^1$ to $Y^2 = p_M^W S_M^2 + p_F^W S_F^2$. The results of this process for trade and national income can be summarized in three inequalities. Growth of income:

$$Y^1 = p_M^W S_M^1 + p_F^W S_F^1 < p_M^W S_M^2 + p_F^W S_F^2 = Y^2, \text{ income gain.}$$

Growth of trade:

$$X_M^1 = S_M^1 - D_M^1 < S_M^2 - D_M^2 = X_M^2, \text{ increased exports of } M.$$

$$M_F^1 = D_F^1 - S_F^1 < D_F^2 - S_F^2 = M_F^2, \text{ increased imports of } F.$$

To achieve the observed specialization, resources must be shifted from the falling-price sector (Food) to the rising-price sector (Manufacturing). This price differential is what stimulates increased resource demand in Manufacturing, bidding labor away from Food. When these adjustments have run their course, employment is higher in Manufacturing and lower in Food, but wages are higher in both sectors since there is only one labor market. These observations reflect another fundamental insight of trade theory.

To measure the efficiency and distributive effects of trade liberalization between two countries we consider trade from a traditional supply and demand perspective, and evaluate welfare in terms of Consumer and Producer Surplus. Looking at Food

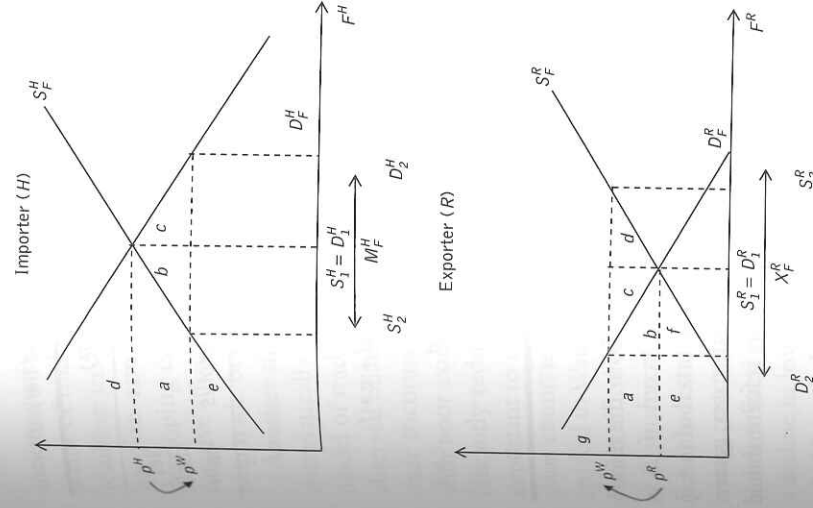


Figure 7.5 Domestic gains and losses from trade in food

this time, we depict in Figure 7.5 both the importing (H) and exporting country (R). Here, illustratively, H would be China and R Brazil.

We calculate in Table 7.1 the consumer and producer surplus to characterize the welfare gains or losses for consumers, producers, and the nation as a whole from moving from autarky to trade.

This analysis shows that trade can be a contentious issue in both countries due to its redistributive implications. Although both nations gain in the aggregate (Net Social Gain or surplus ($NSG > 0$)), consumers do so at the expense of producers in the importing country (H), and the other way round in the exporting country (R). Hence in both countries there are aggregate efficiency gains, but also winners and losers from trading Food. An example would be trade in corn between the US (R) and Guatemala (H) under CAFTA (the Central America Free Trade Agreement). The US has comparative advantage in corn and will export, while Guatemala will import. Both countries gain overall, but farmers lose in Guatemala, while consumers gain. This explains the strong resistance of corn producers to the CAFTA agreement, while urban interests were in favor.

Because trade liberalization creates positive NSG with winners and losers, taxes and transfers can be used to compensate the losers and achieve Pareto optimality after

Table 7.1 Welfare gains and losses from trade for consumers, producers, and the nation

	Importer (H)			Exporter (R)	
	Consumer surplus	Producer surplus	Net social gain	Consumer surplus	Net social gain
Surpluses under autarky	d	$a + e$		$e + f$	
Surpluses under trade	$a + b + c + d$	e			
Gains from trade	$a + b + c$	$-a$	$b + c$		$a + b + c + d + e + f$
Sign of gains from trade	+	-	+	-	+
					$c + d$

compensation. Pareto optimality means that there will be no losers from the reform after compensation has been paid. In Table 7.1, consumers can be taxed of (a) in Home to compensate producers for their losses, and producers can be taxed of $(a + b)$ in Rest of World to compensate consumers for their losses. In both cases, gainers still gain after tax because $NSG > 0$. In principle, a Pareto-optimum reform should be politically feasible.

The big question for losers is whether compensation will effectively be paid after trade liberalization has occurred. There is a difficult *time consistency* problem to be addressed here because liberalization will occur before the gains from liberalization have effectively materialized (Fernández and Rodrik, 1991). Compensation cannot be paid (or be set aside in escrow) before the trade reform has occurred. To make the trade reform politically feasible the government needs a *commitment device* that guarantees losers that they will be compensated for their losses through a tax on winners. As we will see later when we address the political economy of policy (Chapter 21), a key difficulty in implementing policies that have a time-consistency problem is the pervasive lack of credible commitment devices available to governments. Indeed, many good reforms that can create NSGs remain unfulfilled because a credible commitment to pay compensation to achieve Pareto optimality cannot be made.

It should also be clear that, while both countries gain from trade, these gains can be unequal. There is no reason in Table 7.1 for $(b + c)$ in the importing country H to be equal to $(c + d)$ in the exporting country R. There is also an issue of the differential capacity of countries to capture the gains from specialization shown in Figure 7.4, particularly when the trade agreement is between an industrialized and a developing country, as is the case with many of the recent bilateral agreements such as NAFTA (between Canada, the US, and Mexico) and CAFTA (between the US, Central American states, and the Dominican Republic). This is in part due to

the unequal capacity of the countries to adjust their production patterns to the new terms of trade and specialize to maximize gains. Trade has thus been denounced as resulting in “unequal exchange.” Stiglitz and Charlton (2005) have called for the need to complement trade agreements with “behind the border” assistance for developing countries to help them adapt their production structures to their comparative advantages in trade so there can be “Fair Trade for All.” Aid-for-trade would help trade become a more effective instrument to promote development.

Another difficulty for poor countries in gaining from trade is that they may face systematically higher export costs than rich countries. Waugh (2010) has developed a model of trade frictions between rich and poor countries. He finds that to reconcile observed bilateral trade volumes and price data with the predictions of his model the trade frictions between rich and poor countries must be systematically asymmetric, with poor countries facing much higher export costs relative to rich countries, significantly reducing their exports. He argues that these trade frictions are sufficiently important to contribute to standards of living that are 30 times higher in rich than in poor countries. However, the source of poor countries’ high costs, calculated as a residual in Waugh’s model, isn’t clear, meaning that the channels involved will need to be identified to provide a basis for policy recommendations.

A source of tension in opening a country to trade is the differential skills components of the goods traded. If trade is between low skill goods exported by a developing country (such as apparel in China) and high skill goods exported by an industrialized country (such as electronic products in the US), then trade will induce a decline in low-skill wages in the industrialized country relative to high-skill wages, and an increase in low-skill wages in the developing country relative to high-skill wages.

This result is known as the Stolper–Samuelson theorem: a rise in the relative price of a good due to trade opening (here, the low-skill good in China and the high-skill good in the US) will lead to a rise in the return to the factor used most intensively in the production of the good, and, conversely, to a fall in the return to the other factor. For this reason, low-skill workers in the industrialized country who anticipate this

relative decline in purchasing power may strongly resist trade agreements. Trade agreements may contribute to rising inequality in wages to the detriment of low-skill workers, as has been the case in the US for the most recent decades of increasing globalization. In the developing country, by contrast, trade expansion should be effective not only for poverty reduction (income gains for low-skill workers), but also contribute to a decline in income disparity between high- and low-skill workers. But for this to happen complementary reforms may be needed, as we discuss below in asking the question: is trade good for poverty reduction?

ABSOLUTE, COMPARATIVE, AND COMPETITIVE ADVANTAGE

According to Ricardo (1817), two countries—North and South, say—will gain from trading in two commodities—food and textiles, say—even though one—South, say—may have absolute advantage in both. Absolute advantage is having a lower unit

cost of production in both goods. Consider two countries with the same resource endowments. Factors are perfectly mobile across sectors and fully immobile across countries. If all resources were allocated to the production of only one good, production levels achieved in tons would be as in Table 7.2, panel A.

Table 7.2 Absolute and comparative advantage in trade

A. Production and consumption in North and South without trade and all resources allocated to production of one good

	Food	Textiles	Opportunity cost of food in tons of textiles	Opportunity cost of textiles in tons of food
North	100	100	1	1
South	400	200	0.5	2
Total	500	300		

B. Production and consumption in North and South without trade, with equal allocation to sectors

	Food	Textiles
North	50	50
South	200	100
Total	250	150

C. Production after trade

	Food	Textiles
North	0	100
South	300	50
Total	300	150

D. Consumption after trade

	Food	Textiles
North	75	50
South	225	100
Total	300	150

E. Gains from trade

	Food	Textiles
North	25	0
South	25	0
Total	50	0

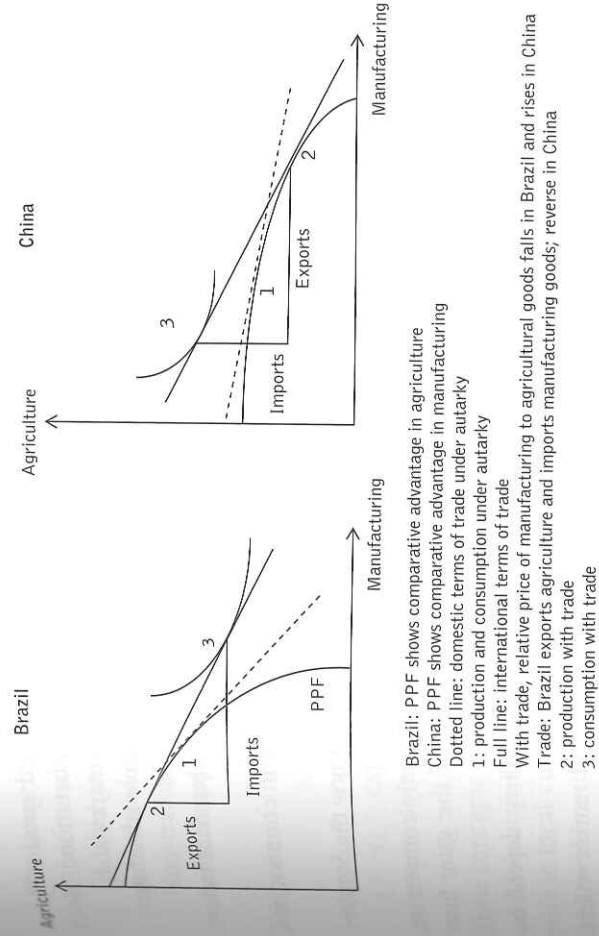


Figure 7.6 Factor endowments, comparative advantage, and trade

This shows that South has absolute advantage over North in both goods as it can produce more (400 food or 200 textiles) vs. South (100 food or 100 textiles) with the same resource endowment. Under this condition, is there a reason for trade? Yes, because South has an opportunity cost in producing food in terms of forgone textile production that is only 0.5 compared to 1 in North. North has an opportunity cost of producing clothes in forgone food production that is 1 compared to 2 in South. The two countries have different comparative advantages, North in textiles and South in food, that make trade mutually beneficial. As opposed to absolute advantage, comparative advantage is having a lower opportunity cost in production than the other country. In this case, there will be gains from trade for both countries.

In Panel B, production and consumption before trade are determined by an arbitrary 50 percent allocation of production capacity to each sector. The domestic terms of trade in North are 1, and 0.5 in South. If the international terms of trade are within this range, say $2/3$, countries will gain from trading, with production as in Panel C and consumption in Panel D. North exports 50 of textiles and imports 75 of food. Gains from trade are shown in Panel E, with both countries gaining from greater specialization in production based on comparative advantage and achieving higher consumption levels in food.

The logic of comparative advantage and trade between Brazil and China is illustrated in Figure 7.6. The PPF (production-possibility frontier) for Brazil shows that factor endowments give it comparative advantage in agriculture, while the PPF for China shows that factor endowments give it comparative advantage in manufacturing. Before trade, production and consumption are at 1 in both countries. Opening to trade will displace production to 2 and consumption to 3. Brazil specializes in

agriculture, exports agricultural products, and imports manufactured goods. China specializes in manufacturing goods, exports manufactures and imports food. Both countries gain from trade as utility at 3 is higher than it was under autarky at 1.

These are the lessons from the theory of trade based on comparative advantages:

1. A country should export the commodities that use its relatively abundant factors, and import the commodities that use its relatively scarce factors.
2. Labor-abundant countries export labor for capital through trade in commodities, while factors are internationally immobile.
3. Trade in products leads to eventual factor-price equalization. This is the Stolper-Samuelson theorem.
4. These results hold under the assumption that markets are perfectly competitive, with all externalities internalized (see below for an analysis of the gains from trade when environmental externalities are not internalized).
5. Gains from trade are not necessarily equal across countries. They depend on international terms of trade.
6. No mechanisms are in place to ensure that losers in the world market will be compensated by winners. Within a country, losers can be compensated by winners through taxes and transfers if the government has the political will to do so.

Ricardo's theory of comparative advantage, developed in its current version by Heckscher and Ohlin as the basis on which to specialize and trade, is a static concept based on countries' differences in factor endowments. The risk, however, is that countries will specialize in sectors with little potential for future productivity growth, providing no guidance for the design of a long-term industrialization strategy. This led Michael Porter (1985) to propose instead the concept of *competitive advantage*. Here, a country achieves competitiveness in trade not only through resource advantage, but also capabilities advantage derived from superior labor skills, technology, and reputation. Capabilities advantage includes patents and trademarks, proprietary know-how, and reputation, all of which can be established irrespective of resource endowments. Competitive advantage can also be acquired through international factor mobility as in an open-economy industrialization (OEI) strategy (see below), where foreign direct investment (FDI) is the vehicle for acquiring capital, skills, and the embedded determinants of competitiveness. The interest of competitive advantage for development policy is that it opens the door to strategic planning about how to achieve industrialization based on endogenous advantages that can be purposefully invested in and acquired.

TRADE POLICY AND INDICATORS OF PROTECTION

To characterize a country's trade policy, we need a certain number of indicators that can tell us how "free" it is, or how distorted away from free trade through various trade interventions. Consider the following definitions:

p^s = world market price in foreign currency (US\$);

p^b = border price in local currency units (LCU);

p^d = domestic price in LCU;

e = nominal exchange rate in LCU/\$;

Tradable good (T) = good, the price of which is determined by the border price and by trade and exchange rate policies;

Non-tradable good (NT) = good, the price of which is determined by equality between supply and demand on the domestic market.

The price of a tradable good is: $p^d = p^b(1 + t)$, $p^b = ep^s$, where:

$t = t_M$ = import tariff rate;

$t = -t_E$ = export tax rate;

$t = s$ = domestic producer subsidy (+) or tax (−) rate.

These concepts are illustrated in Table 7.3. In this example, the international price is \$100/metric ton (MT). The official exchange rate is 40 rupees/\$, so the border price in local currency is 4,000 RS/MT. If there is an import tariff of 30 percent, then the domestic price in local currency is 5,200 RS/MT. The price is thus affected by both the exchange-rate policy that sets e , and the trade policy that sets t_M . These two policy instruments can complement or substitute for each other.

There are two indicators typically used to characterize the degree of protection of a particular commodity. They are the nominal and the effective protection coefficients, defined as follows:

Nominal protection coefficient = NPC

$$NPC = \frac{p^d}{p^b} = 1 + t$$

If $NPC > 1$, producers are protected, consumers (users) are dis-protected (taxed).

If $NPC < 1$, producers are dis-protected (taxed), consumers (users) are protected.

Table 7.3 *International, border, and domestic prices as affected by exchange-rate and trade policies*

Domestic price	Trade policy	Border price	Exchange rate	World market price
	Tariffs taxes subsidies		Nominal exchange rate	
Formula	t_M, t_E, s	$p^b = ep^s$	e	p^s
Example	$t_M = 0.3$	$4000 * 1.3 = 5200$ RS/MT	4000 RS/MT $e = 40$ RS/\$	100 \$/MT

Nominal protection can also be measured as a rate, the nominal rate of protection (NRP):

$$NRP = \frac{p^d - p^b}{p^b},$$

which will then be > 0 if producers are protected and < 0 if taxed. This is also called the nominal rate of assistance (NRA) when direct output subsidies are added to the domestic price.

Recent NRA measures by Anderson (2008) show that while taxation of agricultural exportables was quite high in the 1960s to mid 1980s (typically 30 percent, see Krueger *et al.*, 1988), it has now been reduced to zero as a consequence of extensive trade liberalization (Figure 7.7). Importables remain protected (typically 20 percent) by import tariffs, usually to favor domestic producers from a national food-security perspective. Overall, between exportables and importables, agriculture now benefits

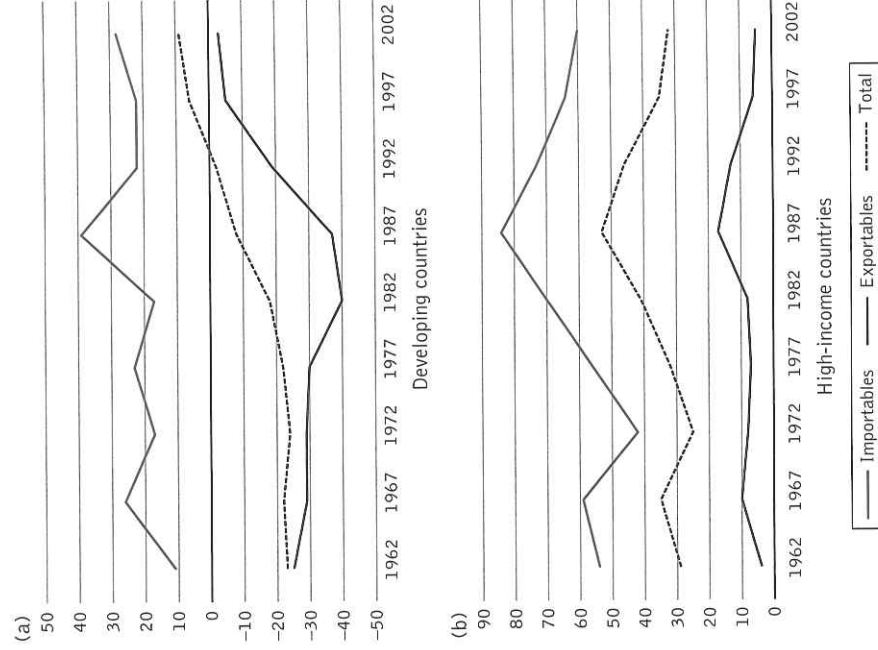


Figure 7.7 Nominal protection of agriculture in developing (a) and high-income (b) countries 1962–2002

Source: Anderson, 2008.

from protection as opposed to taxation in the previous period. In high-income countries, protection has been the norm, and it has not changed significantly over the period analyzed.

Effective protection coefficient = EPC

The effective protection coefficient takes into account the impact of trade and exchange-rate policies not only on the product side, but also on the cost of intermediate inputs used in production.

Define:

p = price = unit value of output;

c = cost of intermediate goods used in production per unit of output (purchased inputs from other industries).

VA = value added = cost of primary factors such as labor, land, and financial capital per unit of output.

$p = c + VA$. Hence: $VA = p - c$. The effective protection coefficient is:

$$EPC = \frac{VA^d}{VA^b} = \frac{p^d - c^d}{p^b - c^b}.$$

If $EPC > 1$, producers are protected, consumers (users) are disprotected (taxed).

If $EPC < 1$, producers are disprotected (taxed), consumers (users) are protected.

Note that EPC is a better measure of protection than NPC since a product may be protected but, if inputs are also protected, the effective protection is less than the nominal protection.

Real protection

The domestic price of imported goods or of import substitutes is:

$$p^d = ep^s (1 + t_M).$$

The domestic price of exported goods is:

$$p^d = ep^s (1 - t_E).$$

We see from this that we can protect tradable goods through exchange-rate policies and/or trade policies. For example, a devaluation (or depreciation) of the exchange rate raises e and increases the price of tradable goods. Similarly, an increase in import tariffs or a decline in export taxes will increase the domestic price of tradable goods.

We can develop an indicator of protection, the real protection coefficient (RPC), that tells us how much of protection comes from exchange rate distortion (EDist) and

how much from trade distortions (NPC). Let e^* be the equilibrium exchange rate (i.e. the level at which e should be in equilibrium, as we will see in Chapter 10) and $p_b^* = e^* p^s$ the border price at the equilibrium exchange rate. The RPC is:

$$RPC = \frac{p^d}{p_b^*} = \frac{ep^s(1+t)}{e^*p^s} = \frac{e}{e^*}(1+t) = EDist.NPC,$$

the product of the indicators of exchange-rate and trade-policy interventions. Between the mid 1960s and the mid 1980s, when exportable agriculture was heavily taxed, as seen in Figure 7.7, most of the taxation came from an overvalued (low) exchange rate (EDist) as opposed to heavy export taxes (NPC).

Exchange-rate and trade policies can be substitutes or complements for protecting a commodity. For example, when there is a devaluation of the exchange rate in Argentina, the country typically raises export taxes on agriculture to lower the domestic price of food, thus redistributing income from agriculture (that benefits from the devaluation) to the urban sector (that benefits from the export tax). Similarly, the world food crisis has induced the Argentine government to raise export taxes on agriculture in order to protect consumers and redistribute income from farmers (considered wealthy overall as farms can be very large) to the rest of society (poverty is mainly urban), creating huge political discontent among farmers.

Trade creation and trade diversion

When a free-trade agreement or a customs union is created, exporters to countries in the agreement/union may find themselves displaced by exporters from within the union. Take the example of lamb imported by the UK from New Zealand, the most efficient producer in the world. When the UK joined the European Union, tariffs and non-tariff barriers were imposed on New Zealand imports, and France, a higher-cost producer but within the EU, became the new source of imports for the UK. Trade was *diverted* away from the more efficient producer, New Zealand, and trade was *created* for France. The efficiency gain of a free-trade agreement or customs union is thus the net effect of trade creation and diversion. In the short run, the efficiency loss from trade diversion will be larger than the efficiency gain from trade creation. In the longer run, a reason for enacting the agreement/union may be to seek productivity gains in the new source of exports, resulting in net efficiency gains.

USING TRADE POLICY FOR DEVELOPMENT: TARIFFS AND SUBSIDIES

Given the significance of trade for growth, domestic income distribution, and risk management, it is not surprising that trade policy is a major instrument for development. Indeed, most countries have entire ministries devoted to trade and trade policy, particularly in developing countries where trade provides important opportunities for growth, technology transfers, and public revenues. Because of their authority over national borders, governments can exert significant direct influence on trade, and

they can also exert pervasive influence on trade incentives and trade-related behavior through other policies.

Import tariffs: protecting sectors

One of the most common trade policies is import protection, where governments take measures to limit foreign competition in domestic markets. Imports can be restricted by many kinds of administrative measures such as safety standards (e.g. sanitary and phytosanitary standards for food imports), trade preferences that admit goods from some countries but not from others, quantity restrictions, and, the most common method, tariffs, also called *ad valorem* import taxes. As one might suppose, these measures restrict market opportunities in order to serve some national policy agenda, including consumer safety, protection of domestic firms and/or jobs, food security, and geopolitical goals. Tariffs may also be introduced in response to lobbying, from employers or workers who want to restrict competition from foreign firms to protect profits or jobs.

The efficiency and redistributive effects of an import tariff are analyzed in Figure 7.8, using the tools of consumer and producer surplus in welfare economics. Assume that imports are perfect substitutes for the domestic good and that the importing country is small, so changes in imports do not affect the world price (p^S). In this case, application of a tariff t yields a domestic price $p^d = ep^S(1 + t)$, and the detailed welfare effects are as described in Figure 7.8 and Table 7.4. The import tariff benefits producers, hurts consumers, benefits government through tariff revenues, and creates a net social loss relative to free trade. The inefficiency cost is measured by areas $(b + d)$. The redistributive gains to the benefit of producers and government have a sharp cost both for consumers and for society at large.

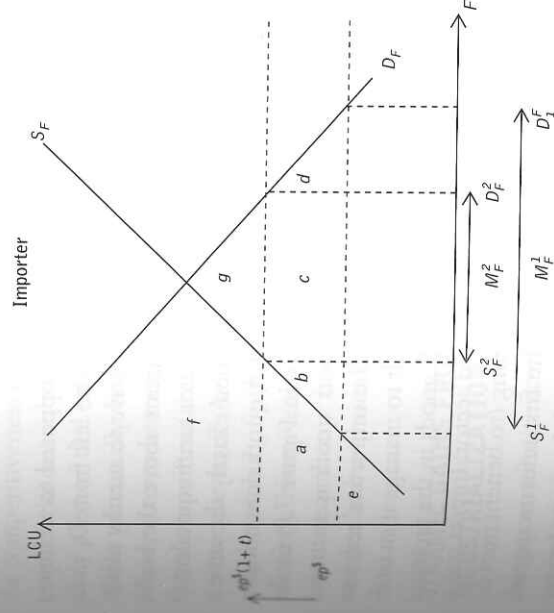


Figure 7.8 Welfare analysis of an import tariff

Table 7.4 Gains and losses from an import tariff for consumers, producers, and the nation

	Exporter			
	Consumer surplus	Producer surplus	Government budget	Net social gain
Free trade	$a + b + c + d + f + g$	e	0	
Import tariff	$f + g$	$a + e$	c	
Net effect	$-(a + b + c + d)$	a	c	$-(b + d)$
Sign of effect	-	+	+	-

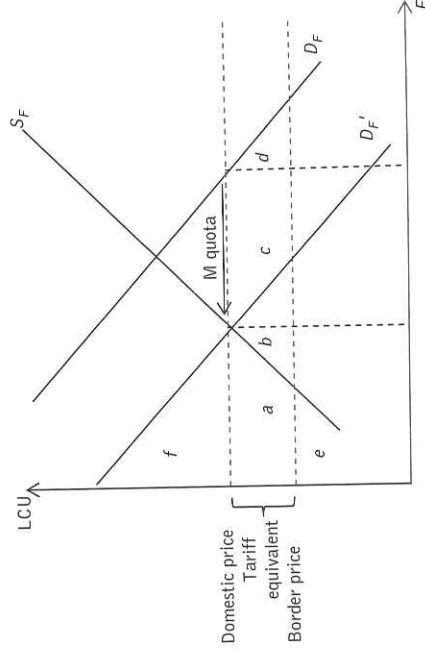


Figure 7.9 Welfare analysis of an import quota

Protection may be obtained by imposing an *import quota* as opposed to an import tariff (Figure 7.9). In this case, domestic demand is shifted to the left from D_F to D'_F by the amount of the import quota. The domestic price falls relative to autarky (where domestic supply equals domestic demand for food), but remains above the border price. This price gap over the border price can be interpreted as a tariff equivalent or an implicit tariff. The welfare analysis of an import quota is then exactly the same as that of a tariff in Table 7.4; the only difference is that an import quota does not generate government revenue (c in Figure 7.8) but instead rent (c in Figure 7.9) for the importers who were granted the import quota. If this import quota is auctioned competitively among importers, government can transform the importers' rent into government revenue. Quotas are, however, much more difficult to manage than tariffs since they require the specification of import quantities of all goods in the protected sector as opposed to a single tariff over prices in the protected sector. Import quotas also invite corruption (to acquire import licenses) and smuggling (to benefit from the high domestic price). Tariffication of quotas is thus one of the first reforms required for membership of the World Trade Organization. It is subsequently easier to legislate the descaling of tariffs than the reduction of quotas.

Example: protection of the sugar sector in the US

Consider the case of US import quotas on sugar.

US domestic production = 6.3 million tons

Import quotas = 2.1 million tons (25 percent of domestic supply)

$p^d = 466$ \$/ton

$p^b = 280$ \$/ton

Implicit tariff = NPC equivalent = 1.66 (i.e. 66 percent nominal protection)

$\Delta PS = \$1066$ million for 12,000 workers = \$90,000 per job

$\Delta CS = -\$1647$ million for 275 million consumers = \$6 per consumer

Rent to foreigners = \$396 million

Efficiency loss = \$185 million

The import quota on sugar thus implies large redistributive gains for producers (and their workers), a small cost per capita for consumers, and a small efficiency loss relative to the magnitude of the distributional effects. Hence it is clear that political demands for the sugar quota are motivated by the large gains for US farmers that will not be opposed by consumers as the corresponding per capita tax is sufficiently small to remain unnoticed by each of them.

Production subsidies: “picking winners”

Another common trade policy to promote the competitiveness of firms with export potential involves subsidizing potential “winners” (Figure 7.10 and Table 7.5). These subsidies typically come in the form of state-subsidized credit, financial guarantees, technological assistance acquired from abroad, subsidies to R&D, and trade fairs to promote the firms on the international market (Wade, 1990). The subsidies improve the competitiveness of the selected firms and help them gain scale to become competitive without subsidy. Production subsidies to potential winners have been extensively used in the export-oriented industrialization (EOI) strategy, analyzed below. While potentially beneficial in the long term, the short-term effect of an export subsidy is to create a gain for the subsidized firms at a cost to government, but at no loss to consumers and with a smaller distortion at the national level than created by a protective tariff. As can be seen in Figure 7.10, the NSG is $-b$ with a production subsidy, instead of $-(b + d)$ with an import tariff. It is thus less disruptive of overall efficiency. However, it implies a cost to government equal to $(a + b)$ instead of a revenue equal to c . It also requires that government pick winners without making mistakes and without falling into cronyism and corruption.

DYNAMIC GAINS FROM TRADE: IMPORT-SUBSTITUTION INDUSTRIALIZATION AS A POLICY GAMBLE

An import-substitution industrialization (ISI) strategy is a dynamic gamble that can have a high development pay-off if it succeeds, but which can also fail. It was followed by many countries that wanted to protect themselves from competition from more

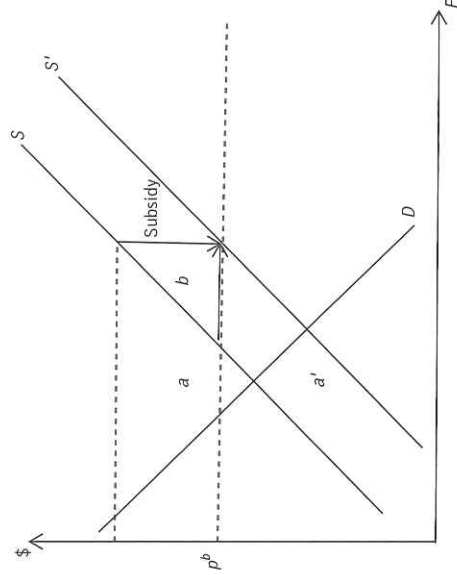


Figure 7.10 Welfare analysis of a production subsidy in support of EO1

Table 7.5 Gains and losses from a production subsidy to stimulate exports under EO1

Exporter				
	Consumer surplus	Producer surplus	Government budget	Net social gain
Net effect	0	$a' = a$	$-(a + b)$	$-b$
Sign of effect	0	+	-	-

advanced countries in order to industrialize. The sequence of moves is described in Figure 7.11, and consists of the following four steps:

1. Before ISI with trade (Figure 7.11a). The terms of trade between agriculture and industry for the country with free trade is the ratio of their border prices p_A/p_I . Production is at A and consumption at C.
2. Introduction of a protective tariff t_M on industry under ISI (Figure 7.11a). The terms of trade for the country become $p_A/p_I(1+t_M)$. Production is now at B and consumption at E.
3. The dynamic gamble is that industrial protection will induce investment and technological change in industry, shifting the production-possibility frontier (PPF) upward toward industry (Figure 7.11b). Now, production is at F and consumption at H.
4. Returning to free trade under ISTE (import substitute then export), production will be at A' and consumption at C'. This is a huge gain compared to the starting point at C thanks to progress in industrialization under temporary protective tariffs.

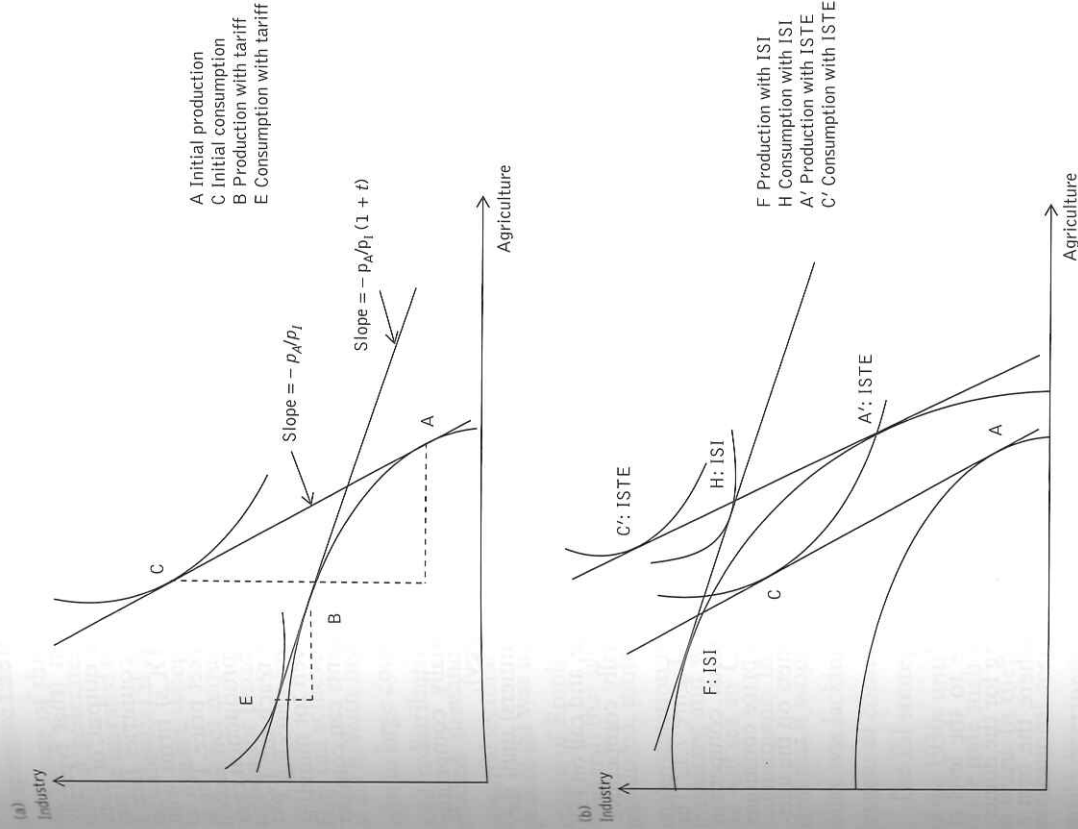


Figure 7.11 ISI strategy as a gamble

The strategy can, however, fail, and it has critics such as Justin Lin (2009) as well as advocates such as Dany Rodrik (2004). It will fail if the PPF does not shift upward toward industry as expected in step 3. It can also fail if the country never returns to free trade as expected in step 4 under the pressure of vested interests in the protected industry, remaining at H instead of shifting to C'. Most countries started their industrialization under ISI, including the Asian tigers, and Latin America after World War Two. However, it was more successful for the first group of countries than the second, where political opposition to a return to free trade was often quite strong under the populist governments in power during the 1945–82 period, when ISI was pursued.

TRADE AND INDUSTRIALIZATION STRATEGIES: HOW TO CHOOSE?

When there are large economies of scale in industrial production (that typically come from fixed costs that need to be spread over large volumes of output, or from learning-by-doing associated with the level of output), latecomer countries face a major obstacle in competing with more developed countries' (MDCs) firms with already established economies of scale that set the international market price. This is the *infant industry* dilemma: the latecomer could have lower average production costs (AC) than MDCs' incumbent firms, but it needs to achieve scale to reach this lower average cost. This is true not only in high-technology sectors, but even for mundane products like modern textiles. How can this be achieved? Governments can consider three alternative industrialization strategies:

1. ISI. Protect sectors of industry until they become internationally competitive and then open the country to free trade (this is the ISTE strategy).
2. EOI. Open the economy and subsidize selected firms (pick winners) until they become competitive.
3. OEI. Open the economy, create an appealing investment climate, and call on FDI to bring in firms already at a scale that makes them internationally competitive.

The differences between these three approaches are summarized in Figure 7.12. The world price p^* is determined by the AC of established international competitors (AC_{MDC}), the incumbent firms, at their current level of output. This price constitutes the reference average cost for domestic firms to achieve competitiveness on the international market.

ISI (Import-substitution industrialization)

Under ISI, import tariffs are imposed to raise the domestic price to the level of the infant industry's AC. This allows the LDC firm to start producing for the domestic market. As output increases, AC falls, eventually to a point where the firm is

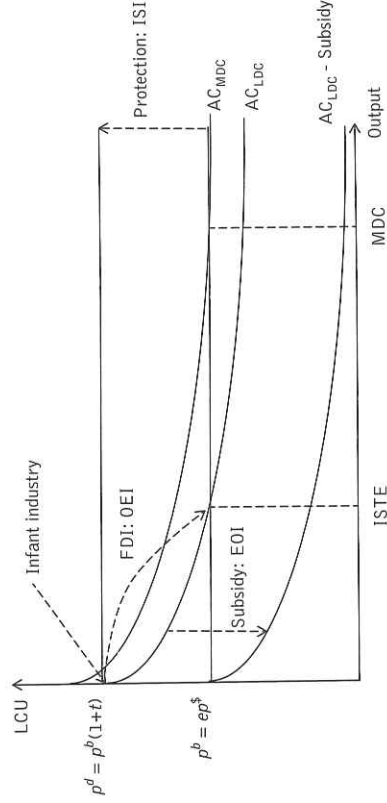


Figure 7.12 Industrialization strategies compared: ISI, EOI, and OEI

competitive on the international market and protection can be removed (ISTE). The advantage of this approach is that it does not require a public budget; on the contrary, it generates revenues for government on competitive imports. These revenues can be invested to provide public goods important for the competitiveness of domestic industry. ISI also has the advantage that firms can learn to compete on the domestic market, where quality requirements are far less than on the export market. And it does not require the government to select specific firms, only to decide on protection for broad sectors of industry.

A difficulty for small countries is that ISI requires a large domestic market in which firms can achieve economies of scale sufficient to become internationally competitive at ISTE. With high inequality and concentrated assets, this may be difficult to achieve even in large countries. This is one of the reasons why Latin American countries pursued redistributive policies such as land reform that could help enlarge domestic effective demand for industrial goods. Another difficulty is that protection creates powerful sectoral lobbies of employers and workers (e.g. Peronism in Argentina at the peak of ISI was supported by both the employers' unions (CGE, the General Confederation of Employers) and the workers' unions (CGT, the General Confederation of Workers)) that will ally to militate against removal of protection. The risk is that, once introduced, protective tariffs will be politically very difficult to remove. Successful implementation requires credibility on the part of government that protection is only temporary, and will soon be decreased following a pre-announced schedule. Yet, as we will see in Chapter 21, governments lack instruments to make credible policy commitments. In South Korea, protection was granted but with a credible announcement that it would only be for five years (Amsden, 1989). In most other places, credibility was lacking, as producers knew that they could capture government over the interests of consumers once their economic positions had been established.

The ISI strategy was widely implemented in Latin America from the depression of the 1930s until the debt crisis of 1982. It was advocated by influential economists of the time such as Raúl Prebisch in Argentina and Hans Singer and Celso Furtado in Brazil. In their view, an important reason to industrialize was the belief that the international terms of trade between primary products and manufactured goods would deteriorate over time, a long-run trend known as the Singer–Prebisch thesis. This prediction did not hold true, as witnessed by the rising relative prices of petroleum resources and mineral products such as copper (Baer, 1972). If the terms of trade deteriorate, countries should move away from primary exports such as agriculture and mining, and industrialize on their own.

ISI was to be pursued first for consumer-goods sectors and later on for the intermediate and capital-goods sectors. It indeed helped to create domestic industries, but protection proved all too difficult to remove, blocking evolution toward successful export industries and reproducing over time high-cost industries paid for by consumers in the form of high domestic prices. In addition, industrializing to substitute for imports does not a priori guide investment toward the country's comparative-advantage sectors. As a consequence, the industry being built behind protective tariffs may never achieve competitiveness in an open economy (Lin, 2009). Finally, as we will see in detail in Chapter 10, countries under ISI maintain appreciated exchange rates

(low official exchange rates *e*) as a consequence of reduced import demand (importers' lower demand for dollars due to import tariffs lowering the domestic price of dollars) and to cheapen imports of capital goods for industry. However, a low exchange rate penalizes agricultural exports, which are typically the source of the foreign-exchange revenues needed to import capital goods for industry. As a consequence, agriculture stagnates, inducing recurrent foreign-exchange crises that can severely limit the capacity of industry to import the capital goods it needs. This conflict between agriculture and industry under ISI, and the resulting economic instability and political confrontations between farmers and industrialists, has been conceptualized as the "theory of sectoral clashes" (Mamalaklis, 1969).

EOI (Export-oriented industrialization)

The EOI strategy consists in subsidizing firms (as opposed to protecting sectors of industry under ISI) that have the potential to achieve competitiveness on the international market. The advantage of the approach is that it can be narrowly targeted to these potential winners, and it does not require trade distortions under the form of tariffs that negatively affect domestic consumers and introduce a large net social loss (Amsden, 1989). It can work for small countries that do not have a large domestic market, but there are four difficulties that must be tackled to make it succeed.

The first is that it is costly for government: where will the subsidies come from? Any fiscal expenditure has an opportunity cost—for example, in providing health, education, and infrastructure to the population. In South Korea and Taiwan, where EOI was successfully applied after 1945, subsidies came in large part from foreign aid, but this is not easily replicable today.

The second difficulty is the need for firms to be directly competitive on the international market (with subsidies) with the ability to achieve quality and reputation to create demand for their products. There is no protected learning on the domestic market as under ISI.

The third difficulty is the risk of corruption in government when choosing which firms to subsidize. The state needs autonomy in assigning and removing subsidies, but it also needs access to detailed information on firms, requiring the kind of embeddedness (close, often personal, relations) that can easily lead to corruption and loss of autonomy. This dilemma of "embedded autonomy" was explored by Peter Evans (1995) for Korea, Brazil, and India. The strategy was successfully used in Japan, e.g. in the 1950s and 1960s to promote its steel industry, and in East Asia, initially with apparel firms, followed by home-appliance and electronics firms. But it also contributed to the 1997 Asian financial crisis, where cronyism in subsidizing firms that did not need subsidies or could not achieve competitiveness even after being subsidized implied continued high fiscal costs and the continued existence of inefficient firms.

Finally, firm-level subsidies, as opposed to sector-level tariffs, are more exposed to rent-seeking pressures, making their subsequent removal more difficult than that of tariffs. According to Rodrik (1995), this is because a tariff is essentially a public good to all producers of import substitutes in the protected sector of industry. Because they

only derive a small part of the benefits of lobbying, individual producers will tend to free-ride on lobbying rather than invest significant resources in sustained political influence. In the case of producer subsidies, by contrast, firms are individually targeted and prone to client relationships between entrepreneurs and regulators. They will be more inclined to invest in lobbying to attempt to reproduce the subsidy even once competitiveness has been achieved. Tariffs are thus more distortive (as seen in Figure 7.8), but less prone to lobbying; subsidies are less distortive (as seen in Figure 7.10), but more prone to lobbying. A forward-looking government concerned with keeping lobbying in check to move toward trade liberalization once industrialization has been achieved may well prefer the more distortive tariff instrument.

Effective use of subsidies has always been difficult and controversial in policy-making. To be effective, a subsidy needs to be “smart” in meeting the following three generic conditions:

- It does not create perverse behavioral responses by the recipient, such as disincentives to perform (reduce average costs).
- It does not displace sustainable ways of solving the problem, but, on the contrary, encourages them (firms remaining competitive without subsidies).
- It does not become permanent, creating dependency and a continuing drain on resources that have an opportunity cost. The policy-maker wants beneficiaries to “graduate” out of the need for the subsidy.

To achieve this, EOI requires a carefully announced and credible schedule of declining subsidies to help establish industrial capacity and “push” firms down the average-cost curve to the point where they can be autonomously competitive.

OEI (Open-economy industrialization)

The OEI strategy is very attractive as it does not require a long phase of learning, as is the case with ISI and EOI, until firms reach the scale at which they can be competitive without protection or subsidies. Here, the gamble is that putting into place the proper investment climate in an open-economy setting will attract foreign direct investment (FDI) from firms that have already established expertise elsewhere and achieved the scale to be competitive. A good investment climate includes political stability, infrastructure, rule of law, secure property rights, a disciplined and semi-skilled labor force, good macroeconomic fundamentals, and commitment to an open trade and finance regime. The International Finance Corporation and the World Bank (IFC/WB, 2012) publish annually an “ease of doing business” index that ranks countries from 1 to 183. For each country the ranking is calculated as the average of the percentile rankings on each of the ten topics included in the index: starting a business, dealing with construction permits, registering property, getting credit, protecting investors, paying taxes, trading across borders, enforcing contracts, resolving insolvency, and getting electricity.

OEI was successfully implemented in countries ranging from tiny Mauritius to large China. A drawback of the approach is that foreign firms are not a substitute for

domestic industry in terms of long-run industrialization. In this sense, as argued by Rodrik (2004), OEI is not a substitute for an industrialization strategy: it creates industries, but not necessarily a domestic industrial class. China's skillfully promoted domestic firms in sub-contracting with and eventually taking over from foreign firms after a period of learning, helping the country develop its own entrepreneurial class and industry. This was not the case with Mexico (before NAFTA) and the Dominican Republic, where FDI occurs in industrialized zones (also called *maquilas* and enclave industries) using domestic labor but with few linkages with domestic firms.

Note that these contrasted strategies have often been used sequentially, as in Taiwan and South Korea, starting with ISI, following up with EOI, and increasingly relying on OEI. Different countries will use these strategies according to their domestic-market size (key for ISI), fiscal resources (key for EOI), and international appeal (key for OEI). The conditions for success and the risks of failure of each strategy are summarized in Table 7.6.

IS TRADE GOOD FOR GROWTH?

Theory tells us that trade openness is good for growth. Freer trade should provide incentives for investment and technological change, open access to new ideas and innovations, help achieve economies of scale previously limited by small domestic markets, break monopoly power on domestic markets and increase competition, and limit rent-seeking activities that benefit from trade restrictions. Empirical evidence is, however, mixed, suggesting that the link between trade and growth may be mediated by specific country characteristics and complementary policies. Results from cross-country regressions usually show that trade liberalization, as measured by trade shares, is associated with growth. Well known studies include those of Edwards (1997), Frankel and Romer (1999), and Dollar and Kraay (2001). However, rising trade shares are notably endogenous and typically associated with other policy interventions. As suggested by Rodriguez and Rodrik (2001), the introduction of trade policy measures rather than trade shares should be used to characterize trade liberalization. Doing this, Harrison (1996) and Irwin and Tervio (2002) find a significant negative effect of trade on economic growth, while Vamvakidis (2002) still finds a positive relation. These mixed results may be interpreted as giving support to Stiglitz and Charlton's (2005) proposition that trade policy is necessary but not sufficient to induce growth. They argue that it must be complemented with behind-the-border policies such as investment in human capital, labor regulations, and infrastructure to transform trade liberalization into economic growth.

While the effect of trade on growth is thus uncertain, trade has been recognized to increase productivity in manufacturing firms. This has been attributed to access to cheaper imported intermediate inputs and to increased competition from imports, resulting in the elimination of inefficient firms. We have seen this in Topalova and Khandelwal's study (2011) of trade liberalization in India. Tybout and Westbrook found similar results (1995) with trade liberalization in Mexico in the 1984–90 period, when many inefficient firms went bankrupt. These large productivity gains, however, will not translate into aggregate GDP growth on their own.

Table 7.6 ISI, EOI, and OEI compared

Industrialization strategies	Policy instruments	Conditions for success	Advantages	Disadvantages and risks
ISI: Import-substitution industrialization	Protective tariffs on infant sectors of industry	Large domestic market to achieve scale and learning-by-doing	Creates public revenues. No need for government budget	High welfare cost on consumers and high net social loss
	Appreciated (low) exchange rate for cheap imports of capital goods. Asset redistribution (land reform) to reduce inequality and expand domestic market size	Responsive shift in PPF biased toward industry		Will the country have the capacity to import needed raw materials and intermediate goods, especially with appreciated exchange rate discouraging exports (e.g., agriculture)? Foreign exchange shortages will create sectoral clashes and stop-and-go crises with periodic exchange rate devaluation
	Credible policy commitment that protection is only temporary			Political opposition of employers and workers in ISI industries to removing tariffs: STE can fail as protection is reproduced. ISI guided by domestic demand but not by comparative advantage. STE may result in non-competitive industrialization

Industrialization strategies	EOI: Export-oriented industrialization	EOI: Import-substitution industrialization
Policy instruments	Production subsidies to firms	<p>"Pick the winners": firms expected to achieve international competitiveness</p> <p>Investment climate to attract FDI and MNC</p>
Conditions for success	<p>Budget for costly subsidies (need export revenues from agriculture or mining, loans from international banks, foreign aid)</p> <p>Good non-venal bureaucracy: capacity to pick the winners w/o corruption and cronyism</p> <p>Credible schedule to decrease and remove subsidies</p>	<p>Good investment climate: stable government, rule of law, property rights, infrastructure</p> <p>Commitment to open trade policy (role of WTO membership). Stable exchange rate and free movements of capital</p> <p>Skilled and reliable labor force</p>
Advantages	<p>No cost on consumers and smaller net social loss from distortions</p>	<p>Potential for quick success</p>
Disadvantages and risks	<p>Firms must be able to enter world market with subsidies from the beginning (especially if small domestic market)</p> <p>Firms need to establish reputation, quality recognition, trade fairs</p> <p>Less rent-seeking pressures by sectors than by firms (Rodrik, 1995): ISI more distortive but less capture</p>	<p>Does not create national industry and local entrepreneurs (except if linkages with foreign firms exist and learning effects occur)</p> <p>Not a substitute for a domestic industrial policy</p>

IS TRADE GOOD FOR POVERTY REDUCTION?

The same ambiguous result applies to the potential role of trade in reducing poverty. There are basically two channels through which trade liberalization can benefit the poor, one static and the other dynamic.

The static response is due to product and factor-price changes taking resources and technology as given (see Figure 7.3). The product-price effect on poverty occurs when the poor derive their incomes from sectors that have comparative advantage and will benefit from higher prices with trade. This is in general the case when comparative advantage is derived from the production of goods making use of unskilled labor. Examples are the apparel industry in Bangladesh and tradable agricultural sectors such as coffee and cocoa in Côte d'Ivoire. If the poor are workers in these sectors, or small-holder net-sellers of their goods, they will benefit. The factor-price effect is explained by the Stolper-Samuelson theorem: trade changes relative factor prices in favor of the more abundant factor. If poverty is due to an abundance of unskilled labor, trade will increase unskilled labor's wages and reduce poverty. In a famous multi-country study of the impact of trade liberalization on employment, Krueger (1983) used this proposition to argue that trade reforms should benefit the poor.

The dynamic response is the reallocation of labor across sectors in response to the change in the terms of trade, helping countries specialize in response to trade (see Figure 7.4). For this, labor must move out of contracting sectors and shift to expanding ones. Yet empirical studies suggest that labor mobility is typically limited by barriers to the entry and exit of firms and to the hiring and firing of workers (Harrison, 2006). As trade exposes domestic firms to foreign competition, they may respond by increasing the use of temporary and informal labor, with worse employment conditions (Goldberg and Pavnik, 2003). Trade may also stimulate expansion of natural-resource exports that are not labor-intensive. This is the case with the export boom in Sub-Saharan Africa that is driven by mineral and petroleum exports, leaving many young people unemployed and frustrated with social exclusion, as in Nigeria today. Finally, trade may favor industries using mechanization and semi-skilled labor such as the car industry in Mexico, creating a backlash against the poor with unskilled labor (Harrison and Hanson, 1999). NAFTA had very strong positive results on Mexico's balance of trade with the US, and led to sharp increases in manufacturing-labor productivity at the same time as real wages fell (Shaiken, 2014). The rising gap between productivity and wages is reminiscent of the neo-mercantilist model based on cheap labor for the export sector at the cost of domestic purchasing power and slow growth of production for the domestic market. Shaiken attributes this inability of Mexican workers to share in labor productivity gains to lack of labor rights in the export sector to form independent unions that can exert pressure to maintain a link between productivity and wages. It results in what he calls "high-productivity poverty." In China, where poverty has been massively reduced, it is not clear how much of this has been due to trade. Poverty was reduced before trade liberalization as a consequence of the decollectivization of agriculture, the household-responsibility system in farming, and domestic market liberalization.

Empirical studies give conflicting evidence on the trade–poverty relation, as expected with so many competing channels at play. In her vast study of country cases, Krueger (1983) finds that exporting sectors were indeed labor-intensive, but that the employment effects of trade liberalization were limited and that benefits did not trickle down to the poor. Subsequent studies that explicitly address the poverty-reduction value of trade liberalization such as Beck *et al.* (2005) and Dollar and Kraay (2001) found no effect. Others such as Guillaumeont Jeanneney and Kpodar (2011) found that trade could in fact increase poverty. An interesting result obtained by Agénor (2004) is the existence of a Kuznets inverted-U relation between globalization and poverty: first, trade opening leads to contraction of the import-competing sectors, increasing poverty, to be followed in a second stage by expansion of the export-oriented sectors that can reduce poverty.

Autor *et al.* (2013) analyze the impact of imports from China on the US labor market. They identify causality by using an instrumental variable approach, where the growth in US imports from China is predicted by the growth in Chinese exports to other high-income countries, reflecting changes in supply conditions in China, exogenous to labor-market conditions in the US and thus meeting the exclusion restriction. They isolate the impact on the labor market by focusing on regional economies (counties) with manufacturing industries that compete with Chinese imports. For example, Raleigh in North Carolina competes with Chinese furniture imports, while Fresno in California specializes in fruit and vegetables that are not exposed to Chinese competition. They develop on that basis an index of “exposure” to Chinese imports. They find that the negative effects of exposure for US workers have been large. They attribute 25 percent of the decline in US manufacturing employment during the 1990–2007 period to imports from China. Import competition also decreased labor-force participation, lowered wages on local labor markets, and induced a rise in uptake in unemployment and disability transfer benefits. Reductions in earnings are regressive as they are concentrated among workers with lower initial wages and weaker attachment to the labor force. Consumer gains have thus been paid for by declines in labor incomes and the shift of the burden of displacement to public transfers. High-wage workers are better able to cope with import competition. This phenomenon of consumer gains at the cost of income losses for low-wage workers is what Robert Reich (2008) has analyzed under the label of “supercapitalism.”

The policy implication is that, as for growth, the poverty-reduction benefits of trade do not accrue automatically, and that complementary policy reforms are needed to make trade liberalization into an effective instrument for poverty reduction. This is especially important in supporting the reallocation of resources toward sectors with newly acquired comparative advantages and in helping the poor participate in these sectors as workers or entrepreneurs. Reallocating resources requires policies to improve the investment climate (Newfarmer and Sztajerowska, 2012), reduce abuse of market power, and develop financial markets (Le Goff and Singh, 2013); and increasing the poor’s participation requires policies to develop labor skills, support entrepreneurship, and establish social-safety nets to encourage risk-taking (Karnani, 2011).

TRADE AND THE ENVIRONMENT

The dilemma of differing environmental standards

Countries that trade have different levels of domestic regulation of the environmental effects of production. Some have strict policies to internalize negative pollution externalities. Others either do not have these policies in place or do not enforce them. This creates conflicts among countries as differential regulation of environmental externalities can create unfair advantages in trade. Developing countries with weak environmental regulation can easily be accused of serving as production havens for polluting activities for exports. In many cases, pollution spills across borders or into the global environment (such as chlorofluorocarbons that destroy the ozone layer, SO_2 that contributes to acid rain, and CO_2 that causes climate change). Trade agreements have typically been concerned with *product* specifications (price policies, subsidies, quantity restrictions, dumping, food-safety standards) and not with *process* specifications (environmental and labor conditions). With increased globalization, this is now changing. The NAFTA trade agreement between Canada, the US, and Mexico had environmental and labor side agreements to regulate process in addition to product. This is pushing countries to harmonize their environmental and labor policies for the sake of fairer trade. It is well known that environmental policies become more stringent with rising per capita income. Forcing developing countries to have stricter environmental policies because they trade may not correspond to their domestic policy priorities. Requiring harmonized environmental standards can be unfair to them, limiting their opportunities to grow, as today's industrialized countries did not face strict environmental regulations when they were at similar levels of GDPpc.

Limiting developing countries' access to more developed countries' markets because they have environmental standards that correspond to their own priorities can be seen as disguised protectionism. At the same time, free trade can induce poor countries' governments to lower their environmental standards as a way of increasing their competitiveness in exporting to industrialized countries, inducing a race to the bottom in environmental protection. This creates a huge policy dilemma. At the same time, trade agreements are one of the few instruments that can serve as a disciplinary device for countries that do not have the will to improve their environmental standards.

Impact of environmental regulation on import and exports

We consider the case where there is a negative externality in production and where the polluter does not have property rights over pollution. He can then be liable for the polluter-pays principle and be subjected to a tax to reconcile the private cost of production (where he externalizes pollution costs on others) with the social cost of production (where the externality is internalized as a private cost, through taxation, for instance). This will be analyzed in detail in Chapter 15. We follow here the implications of opening the country to trade when it will be either a net importer or a net exporter of the polluting good, and when production decisions are based on either private costs (with a negative externality) or on social costs (when the externality is internalized through taxation).

Gains from trade for a net importer

Opening the country to trade in Figure 7.13 will transform it into an importing country since the border price (ep^s) is inferior to the domestic price under autarky. Net social gains (NSGs) from trade with production decisions at private costs in Table 7.7 are equal to 1 + 2, and these gains are completely captured in the form of consumer surplus. Trade without environmental regulation eliminates part of domestic pollution because production is reduced from q_A to q_P by imports. NSG from reduced pollution are equal to 3 + 5. Pollution remains on reduced domestic production. The importing country with no environmental regulation thus has a double gain from trade opening: strict gains from trade and environmental gains from reduced production of the polluting product

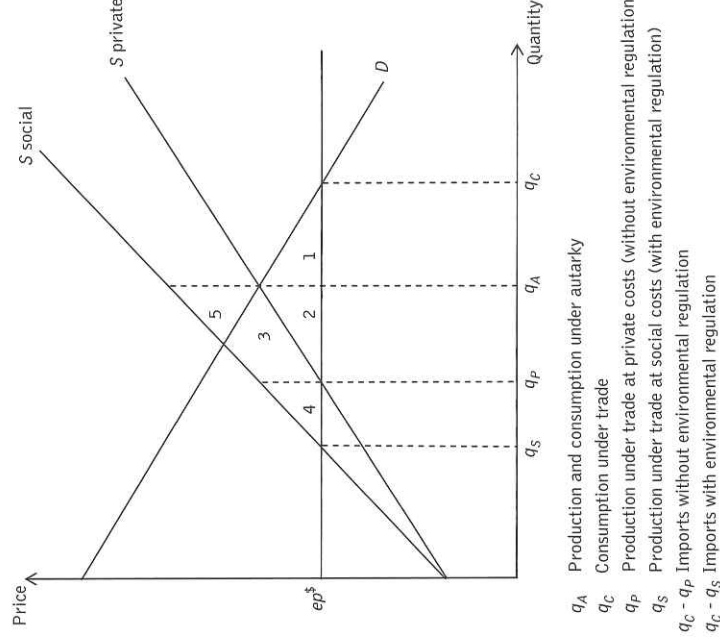


Figure 7.13 Gains from trade for an importing country with and without environmental regulation

Table 7.7 Gains from trade for an importing country with and without environmental regulation

	Production based on	
	Private costs	Social costs
NSG from trade	1 + 2	1 + 2 + 3 + 4
NSG from change in pollution	3 + 5	0
Aggregate NSG	1 + 2 + 3 + 5	1 + 2 + 3 + 4

If the country introduces environmental regulation under the form of a polluter-pays tax, the country internalizes the environmental externality, and production decisions are taken at social costs. NSG from trade are larger (equal to $1 + 2 + 3 + 4$) since the country produces less (at q_S instead of q_P), and imports are larger due to the environmental regulation. All gains are captured by consumers. There are, however, no further environmental gains to be had from trade opening.

Gains from trade for a net exporter

With the border price above the domestic price under autarky, the country in Figure 7.14 will be a net exporter when it opens to trade. Without environmental regulation, there are large gains from trade, equal to $1 + 2 + 3 + 4$, that are entirely captured by producers (Table 7.8). Production increased from q_A to q_P , and exports are equal to $-1 - 5$. There are, however, large social costs associated with the increase in pollution, but pays a heavy price in welfare losses due to pollution. The aggregate NSG from these two effects is ambiguous. Acting as a pollution haven, this export-driven-growth strategy pays a heavy price in unabated pollution costs. You can think of China and its neo-mercantilist growth strategy as an illustration.

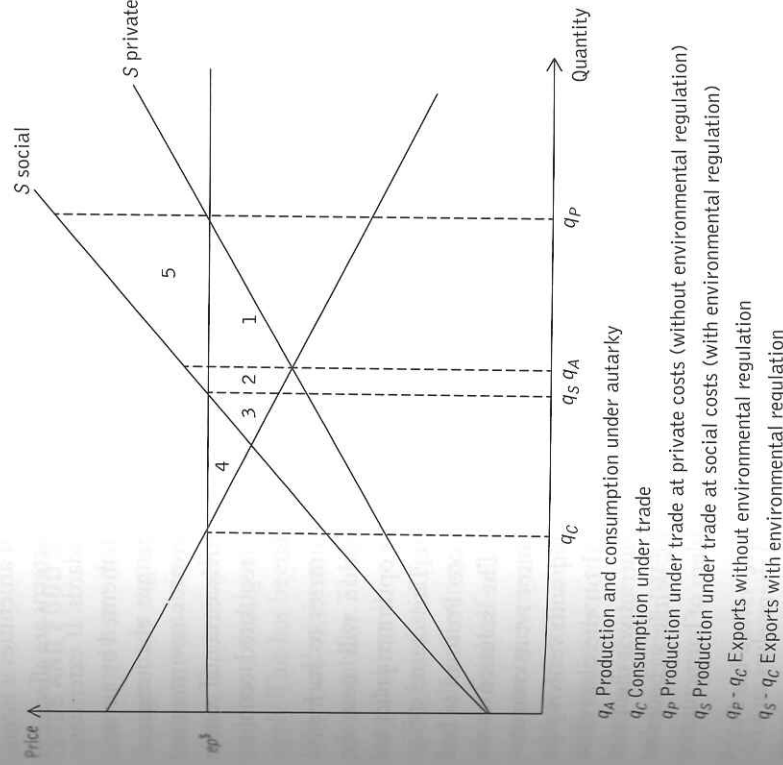


Figure 7.14 Gains from trade for an exporting country with and without environmental regulation

Table 7.8 *Gains from trade for an exporting country with and without environmental regulation*

	<i>Production based on</i>	
	<i>Private costs</i>	<i>Social costs</i>
NSG from trade	1 + 2 + 3 + 4	4
NSG from change in pollution	- 1 - 5	0
Aggregate NSG	2 + 3 + 4 - 5	4

Introducing environmental regulation will reduce domestic production to q_1 . Gains from trade are thus sharply reduced, with production still above what it would be with environmental regulation and no trade. This small gain from trade is, however, now unambiguously positive.

The struggle over harmonized environmental standards in trade

Countries have different environmental standards according to their levels of GDP_{pc}. Poor countries have priorities other than reducing pollution: they want accelerated growth and convergence in income. Demand for environmental amenities is income elastic and rises sharply with income. As a consequence, trade patterns are affected, to the disadvantage of the exporter with tight environmental standards. If externalities are trans-boundary or globalized, trade disadvantages are complemented by environmental costs from the unregulated exporter. In addition, firms are encouraged to move to countries with less environmental regulation. This creates environmental gains in rich countries as pollution-intensive firms leave and environmental costs in the poor host country. Jobs are also lost in environmentally regulated countries, unleashing political pressures to reduce environmental standards.

There are, as a consequence, demands in industrialized countries to harmonize environmental standards across trading nations; but harmonization will mean that regulations are too strict for developing countries relative to their optimum policy, and too lax for developed countries relative to their own optimum. This creates a huge policy dilemma, which to date, in the failure to extend the Kyoto Protocol to both developed and developing countries, has not been resolved. The solution in the NAFTA side agreement on the environment was to let each country set its own environmental standards, but establish a tripartite commission charged with verifying that each country's standards are effectively enforced. This was based on the observation that the main difference in internalizing externalities across countries was due less to differences in legislation than to differences in law enforcement. While a convenient way of gaining time, this leaves unresolved the longer-term problem of harmonization of environmental standards.

Trade, environment, and development agendas can easily find themselves on a collision course (Brainard and Sorkin, 2009), and urgent post-Kyoto negotiations are needed to coordinate the world trading system with development and environmental

concerns. Important challenges in these negotiations include the following (de Melo and Mathys, 2010):

1. Given the importance of trade for development, it is essential to accommodate environmental concerns while maintaining a trading system as open as possible to guarantee the gains from trade, including market access, technology transfers, and international capital movements to the benefit of developing countries.
2. A major contribution of the Kyoto Protocol was the introduction of a global Carbon Credit Trading System (CCTS), together with the Clean Development Mechanism (CDM) (see Chapter 15). This effectively separates where abatement takes place from who bears the cost of abatement. This mechanism helps reduce pollution havens and serves as an instrument to transfer funds and technology to developing countries.
3. Trade in environmental goods and services should be liberalized to the benefit of all. Trade in these goods (ethanol, solar panels) and services are currently subject to high tariff and non-tariff barriers.
4. Finally, the World Trade Organization will have to decide whether imposing import taxes on polluting goods violates free-trade rules. Taxes can be on goods that pollute locally at the point of consumption such as cars; or on goods such as aluminium that pollute where they are produced. This major decision is still pending.

TRADE AND FOOD SECURITY

Governments are deeply concerned with achieving food security for their citizens. An open-trade regime is generally believed to reduce the price variability of staple foods on domestic markets because prices are more stable on the international market. This is simply because demand is more elastic on the international market and production shocks average out over many dispersed areas contributing to aggregate supply. This has been true in general, but recent price spikes on the world market (in 1973–4 and again in 2006–7) have shown that the world market can be the source of price instability. This has brought to the fore the question of food security and how best to achieve it.

Two broad strategies can be pursued to improve a country's food security. One is food self-sufficiency, where food availability derives from national resources. The other is food self-reliance, where trade is used to access part of the food consumed, in particular by eventually exporting non-food cash crops in exchange for the import of staple foods to complement domestic supply. In both cases, the accumulation of food stocks can be used to stabilize prices. When using trade for self-reliance, variable tariffs, taxes, and subsidies can also be used to stabilize domestic prices. We review here how both food stocks and trade interventions can be used to stabilize grain prices.

Price-band buffer-stocks programs

The theory of storage and food-price stabilization was developed by Williams and Wright (1991). Demand for food for consumption is highly inelastic, especially in

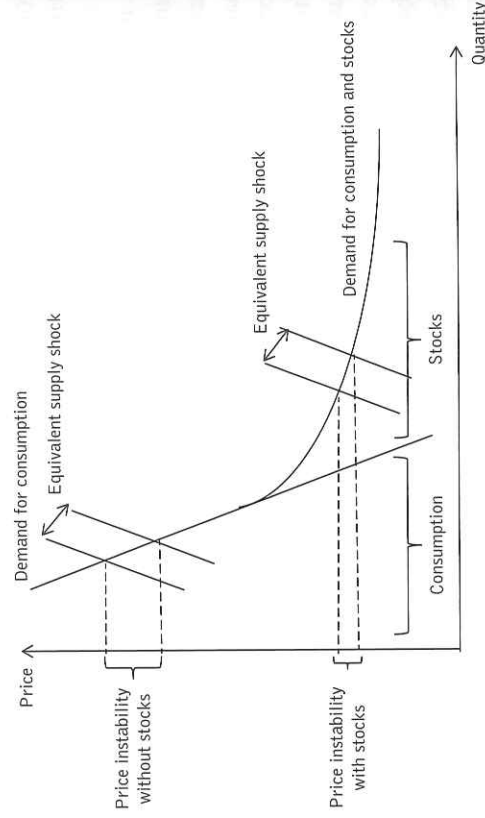


Figure 7.15 *Price stabilization with food stocks*

poor countries. As a consequence, small movements in supply lead to large fluctuations in prices. Food stocks can, however, be accumulated to make demand for food more elastic. Private traders will accumulate stocks if the current price of a stored unit can be expected to rise at a rate that covers the cost of storage and the interest rate on the value of the unit stored. Competitive traders will thus engage in inter-temporal arbitrage in the expectation of deriving a profit by buying at low prices and selling at high prices. This is seen in Figure 7.15, where stocks accumulation at low prices makes demand more elastic. When stocks exist, equivalent supply shocks create much smaller price fluctuations. Use of public food stocks tends, however, to be limited by lack of information on existing private stocks and by vested interests in either holding high levels of stocks to favor producers (as in India) or not accumulating stocks due to their fiscal costs (as in most of the world in the decade prior to the 2006–7 food crisis). Implementation typically follows a policy announcement that prices will be maintained within a predetermined price band. Efficiency gains to society as a whole are dwarfed by redistributive gains and losses between producers and consumers, making the political economy of public stocks management particularly exposed to capture.

Trade instruments to manage price volatility

Prices can also be maintained within price bands through trade instruments. To protect its consumers from price spikes, an exporting country can impose export taxes, export quotas, or outright export bans when prices rise above the band, and use tax revenues to subsidize producers when prices fall below the band. During the 2006–7 food crisis, 33 countries imposed export restrictions to prevent rising international market prices from transferring to the domestic market. India banned rice exports to Bangladesh. While helpful to stabilize domestic prices in India, export restrictions increase price volatility on the international market—in Bangladesh in this particular case.

To protect its producers, an importing country can impose import tariffs when prices fall, and use tariff revenues to subsidize consumers when prices rise. Egypt and Tunisia did this to keep domestic prices low during the food crisis. Chile has also relied extensively on variable tariffs to stabilize domestic prices within a pre-announced price band. As shown by Gouel and Jean (2015), the most effective food-price-stabilization strategy for a country would consist in an optimum combination of storage and trade policies.

Again, the difficulty is in implementation. The setting of price bands is exposed to political debate. Support prices tend to divorce producer responses from long-run changes in international prices—and the large redistributive effects are an invitation to lack of transparency in policy-making and to rent-seeking to achieve political capture (Wright and Prakash, 2011). It is important, too, to recall that reduced fluctuations on domestic markets are achieved at the cost of increased volatility on the world market, where poorer, food-dependent countries may be severely hurt. Social-safety nets targeted at the poorest people can be used to decrease reliance on public stocks and trade interventions to stabilize prices, an issue we will study in Chapter 14.

DECLINE OF THE WTO AND THREATS TO MULTILATERALISM

The WTO was created in 1995 to codify the world trade system under a common set of rules and help weaker countries gain competitiveness in the world market. It now has 159 member countries that participate in decision-making on a highly democratic basis: one country, one vote, irrespective of size and per capita income. Democratic ideals can, however, become a source of paralysis. The WTO started to decline in 2003 when the US at the Cancun meeting refused West African countries' demand to reduce its cotton subsidies. The 2001 Doha round of multilateral agreements has been stalled. Efforts to jump-start the Doha trade negotiations at the 2013 Bali Ministerial Meeting of the WTO only resulted in minor trade-facilitation arrangements on customs barriers and non-tariff measures. The US, EU, and Japan are resisting the reduction of agricultural-trade barriers that would benefit many developing countries with comparative advantage in agriculture. This is especially serious for these developing countries as agriculture is their main road to industrialization (see Chapter 18). Trade liberalization in industry has benefited countries such as China enormously, contributing to the massive decline in poverty over the last ten years; but it has also accelerated the deindustrialization of industrialized countries, faced with competition from low-labor-cost countries. The WTO's three-speed process of trade liberalization, according to which rich countries would reduce tariffs and subsidies faster than emerging countries, while poor countries were exempted, is now being trusted by the US and EU due to the extreme competitiveness of the emerging countries, while Brazil and India want to continue to benefit from this advantage.

The decline of multilateralism has been met with the proliferation of regional and bilateral free-trade agreements (FTAs), currently numbering 379. This is resulting in a fragmentation of the global trading system, favoring the most powerful trading partners, especially the US, EU, and China, while hurting excluded countries. The US is negotiating mega regional FTAs outside the WTO framework: the Trans-Pacific

Partnership (TPP) with eleven countries in the Asia–Pacific region (Australia, Brunei Darussalam, Canada, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, Singapore, and Vietnam) and the Trans-Atlantic Trade and Investment Partnership (TTIP) with the EU. These agreements could have major trade-diversion effects on excluded countries such as Brazil, China, and India. Negotiations are also being pursued among 50 countries on trade liberalization in services, and this is being done outside the WTO framework.

Fragmentation of the global trading system and unequal gains in bilateral trade agreements are a source of both global inefficiencies and inequities. Overcoming this situation requires reactivating the WTO process (Evenett and Jara, 2014). Existing preferential trade agreements need to be brought into the WTO multilateral framework. WTO trade agreements need go beyond trade issues to include respect for social rights, environmental protection, regulation on export embargos, and control over exchange-rate manipulation, designed to gain trade advantage (see Chapter 10). The incredible success of trade in support of productivity growth and, frequently, poverty reduction that has prevailed since the fall of the Berlin Wall is now under serious threat. Only a return to guided multilateralism under the leadership of the WTO will place all participants on a level playing field and help the least advantaged countries achieve competitiveness and derive gains from trade.

CONCEPTS IN THIS CHAPTER

Trade openness
 Comparative advantage
 Absolute advantage
 Competitive advantage
 Gains from specialization
 Singer–Prebisch thesis on international terms of trade
 Time-consistency problem in achieving Pareto optimality after compensation
 Commitment device
 Behind-the-border assistance and aid-for-trade
 Stolper–Samuelson theorem
 Heckscher and Ohlin theory of comparative advantage
 Michael Porter’s competitive advantage
 Trade creation and trade diversion of bilateral free-trade agreements
 Industrialization strategies: ISI vs. EOI vs. OEI
 Border price, domestic price
 Import tariff, export tax
 Production and export subsidy
 Tradable good vs. non-tradable good
 Trade policy indicators: NPC, EPC, NRA, real protection
 Trade creation and trade diversion
 Producer surplus, consumer surplus, net social gain (or deadweight loss)
 Welfare effects of a tariff, a production subsidy

ISI as a gamble
 Infant industry
 Picking winners for subsidy
 Firm-level subsidies more exposed to lobbying than industry-level tariffs
 "Smart" subsidies
 Good investment climate
 Harmonization of environmental standards
 Environmental side agreements
 Self-sufficiency and self-reliance
 Elasticity of demand with food stocks
 Price bands
 Variable tariffs and taxes
 WTO and multilateralism
 Regional and bilateral free-trade agreements

REVIEW QUESTIONS: INTERNATIONAL TRADE AND INDUSTRIALIZATION STRATEGIES

1. Explain why countries trade with a simple economic model. How are efficiency gains achieved? Why are there usually redistributive gains and losses? Give examples.
2. Can trade liberalization be made Pareto optimum after compensation? Why do you need a commitment device to make this credible?
3. Define the world market price, the border price, and the domestic price. How do a country's exchange-rate policy and trade policy affect the domestic price? Define the nominal protection coefficient: what does it mean?
4. Show the effects on consumer surplus, producer surplus, government costs or revenues, and the net social gain associated with an import tariff and a production subsidy.
5. Contrast the three industrialization strategies: ISI, EOI, and OEI. Explain what each strategy consists in and its advantages and inconveniences.
6. Why is ISI a strategy that can fail and what can be done to increase the chances of success?

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