

# International Trade in Agricultural Products



Michael Reed

**INTERNATIONAL**

**TRADE IN**

**AGRICULTURAL PRODUCTS**

*Dedicated to my family, especially Gail, Laura, and Brian, and the University of Kentucky's College of Agriculture, Food, and Environment, which has been tremendously supportive throughout my career.*

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## Chapter 1 Introduction to Agricultural Trade

World trade has experienced an extraordinary expansion since World War II. Technological changes in transportation and communication, a more open world financial and trading system, and increased incomes in most areas of the world have led to these changes. A number of countries have successfully used the world market as their springboard to economic development. Other countries have seen their economic progress hindered because they discouraged imports and other foreign influences. Most countries have become convinced that they must take advantage of increased globalization in order to chart the optimal path for their domestic economies. If they can enter international markets where demand for various goods is growing rapidly, they can benefit by using their scarce resources more efficiently.

The U.S. has always had a relatively open economy, but international trade has become increasingly important to the U.S. In the 1950s, exports and imports accounted for only 3.5 percent and 3.0 percent of U.S. gross domestic product (GDP), respectively (U.S. Bureau of Census). The domestic market was crucial to the well-being of companies because the U.S. growth rate was higher than in the rest of the world. International trade was something that other countries needed to support their economies, the U.S. companies simply had to take care of U.S. consumers to succeed. People knew little about countries outside the U.S. and most Americans thought that the U.S. would continue to be so dominant that what happened internationally would be only mildly relevant to the U.S. economy. The U.S. dollar was fixed relative to the price of gold, so the international market was quite stable and few international disturbances were transmitted into the U.S. economy.

The U.S. trade pattern changed slowly through the 1960s, when exports and imports grew faster than U.S. sales and companies began to see that the international market would play an important role in the future U.S. economy (Table 1.1). However, big changes came about in the 1970s. The U.S. dollar was devalued twice relative to gold in the early 1970s, and finally the fixed exchange rate standard, which was established as part of the Bretton Woods Agreement in 1944, was abandoned in 1973, allowing the value of the U.S. dollar to fluctuate on a daily basis.

The freeing of the exchange rate forced U.S. companies to realize that they were now part of a global economy where happenings in the rest of the world would have impacts on the U.S. exchange rate. The exchange rate is an important device that translates the world economy into the U.S. economy, and its value has a tremendous effect on U.S. prices, trade patterns, and income levels (Schuh). By 1975, U.S. exports accounted for 6.7 percent of GDP and imports were 6.2 percent of GDP (U.S. Bureau of Census).

Some of these increases in trade were the result of changing relative prices of oil and other raw materials during the early 1970s, but most of the impact was simply a more open world trading environment due to the new exchange rate regime, trade liberalization through the General Agreements on Tariffs and Trade (GATT), and the fact that most foreign countries were growing faster than the United States.



**Table 1.1 U.S. Merchandise Exports and Imports Since 1950, Selected Years, in billion dollars.**

		Exports	Imports
	1950	\$ 10.3	\$ 8.9
	1955	\$ 15.5	\$ 11.3
	1960	\$ 20.4	\$ 15.1
	1965	\$ 27.2	\$ 21.4
	1970	\$ 42.6	\$ 40.0
	1975	\$ 107.7	\$ 98.5
	1980	\$ 216.7	\$ 244.9
	1985	\$ 206.9	\$ 345.3
	1990	\$ 393.6	\$ 495.3
1995	\$ 584.7	\$ 743.4	
	2000	\$ 772.0	\$1,224.4
	2005	\$1,283.1	\$1,997.4
	2006	\$1,457.0	\$2,210.3
	2007	\$1,648.7	\$2,350.8
	2008	\$1,839.0	\$2,537.8
	2009	\$1,575.0	\$1,956.3
	2010	\$1,837.6	\$2,337.6
	2011	\$2,106.4	\$2,686.2
2012	\$2,190.6	\$2,762.2	
2013	\$2,262.2	\$2,770.4	

Source: U.S. Bureau of Census

With the more open trading environment and the significant economic strides that many countries had made, the U.S. found that many of its industries faced enhanced competition from foreign companies. U.S. manufacturers of machinery and transportation equipment, which accounted for 35 to 40 percent of U.S. exports in the 1950s and 1960s, found themselves struggling to compete with foreign suppliers in international and domestic markets. Further, imports of machinery and transportation equipment (especially from Europe and Japan), which accounted for only 10 percent of imports in the 1950s and 1960s, suddenly grew to 28 percent of a much larger import volume in the 1970s and 1980s (U.S. Bureau of Census). Other U.S. manufacturers have faced similar competitive problems since the 1960s.

The U.S. is still adjusting to competition from foreign suppliers, but exports and imports have continued to grow on a secular basis. Two recessions in the 2000s reduced U.S. exports in 2001, 2002, and 2009, while U.S. imports only fell during 2009. An important trend on the export side is the increased role of services. Exports of services accounted for 27% of total U.S. exports in 2000, but they accounted for 30.2% in 2014. Imports of services are also important, with 15% of imports accounted by services in 2000 and 17% in 2014. There continues to be trade liberalization in service and many argue that the U.S. has an advantage in supplying those services, so these percentages should continue to increase in the future.

The importance of U.S. imports and exports as a percentage of current GDP continued to grow through 2014, when exports accounted for 13.5 percent of GDP and imports accounted for 16.4 percent. These percentages have fluctuated quite a bit in recent years because export growth depends on GDP of trading partners (which has been weak in Europe at times but strong in China and developing countries at times) while import growth depends on GDP in the U.S., which has been weak since the 2008 financial crisis, but has strengthened progressively since. There has been a wide difference between U.S. merchandise exports and imports since 1976 but that difference has fallen somewhat since the financial crisis. This has some consequences that will be discussed in a later chapter.

## Overview of U.S. Agricultural Exports and Imports

International trade has always been important for agricultural products, especially U.S. agriculture [1]. Countries import many items that are difficult or impossible to produce given their climate and soils. Countries also import agricultural products that are produced at a lower cost by foreign countries. U.S. farmers have relied heavily on exports to provide markets for many of their products. The productive capacity of U.S. agriculture is simply greater than domestic consumers can absorb at market prices.

U.S. agricultural exports averaged slightly greater than 10 percent of farm income in the 1950s and 1960s (Table 1.2). During that time, exports grew from \$3.4 billion in 1950 to \$6.7 billion in 1970 (Economic Research Service). It was during the 1970s, though, when agricultural exports exploded – from \$9.4 billion in 1972 to \$21.9 billion in 1974, then on to \$34.7 billion in 1979. The world had opened to agricultural trade and the U.S. was taking full advantage of that situation.

Agricultural exports from the U.S. grew rapidly in the 1970s. Agricultural producers in this decade experienced a much lower-valued U.S. dollar (which stimulated exports), world crop shortfalls in 1973 and 1974, aggressive in purchases feed ingredients by the Russians when their crops failed, two oil price shocks, and other factors that served to increase world agricultural prices and trade. It was a great time for U.S. agriculture when production expanded greatly and U.S. agricultural exports accounted for 15 to 27 percent of farm income (U.S. Department of Agriculture).

**Table 1.2 U.S. Agricultural Exports and Imports Since 1950, Selected Years, in billion dollars.**

	Exports	Imports
1950	\$ 3.4	\$ 5.1
1955	\$ 3.5	\$ 4.1
1960	\$ 4.5	\$ 4.0
1965	\$ 6.1	\$ 4.0
1970	\$ 6.7	\$ 5.7
1975	\$ 21.9	\$ 9.3
1980	\$ 41.2	\$ 17.4
1985	\$ 29.0	\$ 20.0
1990	\$ 39.4	\$ 22.9
1995	\$ 56.2	\$ 30.3
2000	\$ 51.2	\$ 39.0
2005	\$ 63.2	\$ 59.3
2006	\$ 70.9	\$ 65.3
2007	\$ 89.9	\$ 71.9
2008	\$ 114.8	\$ 80.5
2009	\$ 98.5	\$ 71.6
2010	\$ 115.8	\$ 81.9
2011	\$ 136.3	\$ 98.9
2012	\$ 141.4	\$ 102.9
2013	\$ 144.4	\$ 104.3

Source: Economic Research Service, U.S. Department of Agriculture

Note: Imports are for consumption

U.S. agricultural exports hit a peak of \$43.3 billion in 1981, a level that was not surpassed until 1994 (Economic Research Service). The rest of the world caught up with the U.S. during the 1980s, though. Foreign countries responded to more favorable agricultural prices from the 1970s, and foreign producers increased production greatly. South America and Europe became major crop producers and exporters. The value of the U.S. dollar soared in the early 1980s, cutting into U.S. agricultural exports. Exports reached a nadir of \$26.2 billion in 1986, just after the peak in the dollar's value. U.S. agricultural policies were not flexible; so many U.S. crop producers were shut out of the export market because government support prices were above world levels.

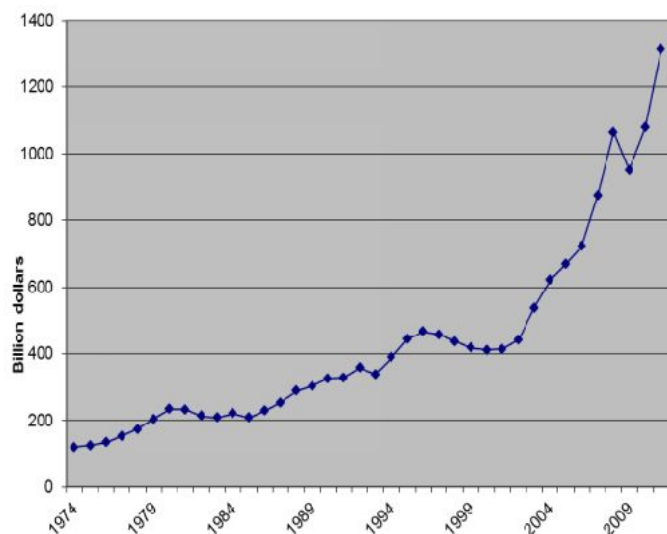
The decade of the 1990s showed a solid, positive trend in U.S. agricultural exports (this trend began in 1987) with U.S. exports reaching another peak \$60.3 billion in 1996 (Economic Research Service). Yet the new century has brought unprecedented growth in U.S. agricultural exports, especially since 2006. The commodity price boom of 2008 (brought on by consecutive years of production shortfalls, increased demand from high income growth, the lack of carryover stocks, and the incentives for use of biofuels) propelled U.S. agricultural exports to reach \$115.7 billion in 2008. Another jump in agricultural exports happened in 2012 and 2013 at over \$140 billion. Now exports account for about 33 percent of farm income (the highest percentage in our history) and there is strong evidence that agricultural exports will continue to expand because the world continue to want more food due to population and income increases. The future of agriculture in South America, the Former Soviet Union and Eastern Europe, demand trends in China and India, and import/export patterns in less developed countries will have tremendous effects on future U.S. agricultural exports.

The pattern of U.S. agricultural imports is much easier to explain (Table 1.2). There is a clear, steady upward trend in agricultural imports since World War II, with imports moving from around \$4 billion in the 1950s and 1960s, to around \$35 billion in the late 1990s, and to over \$100 billion since 2012. Another important consideration is the percentage of imports that compete with domestic production, which was only 40 to 45 percent in the 1950s and 1960s, but was 70 to 75 percent in the 1990s (Economic Research Service). In recent years, there has been a trend toward increased imports of commodities that are not produced in the U.S. because of increased prices for coffee, cocoa, tea, and other raw commodities.

## **Overview of World Agricultural Trade**

The value of world agricultural exports has increased by over 30-fold in nominal terms during the last forty years – from \$43 billion in 1966 to \$1,314 billion in 2011 (Figure 1.1)[\[2\]](#). Some of that increase has come about through increased prices, but world trade volume has also expanded. Agricultural exports increased modestly in most years, but there were some outliers. World trade jumped by 46 percent between 1972 and 1973 when there was a major crop shortfall, increased agricultural prices, and large purchases of grain by the Soviet Union to overcome shortages. Before 1972, the growth in world agricultural exports was slow and export values were low.

**Figure 1.1 World Exports**



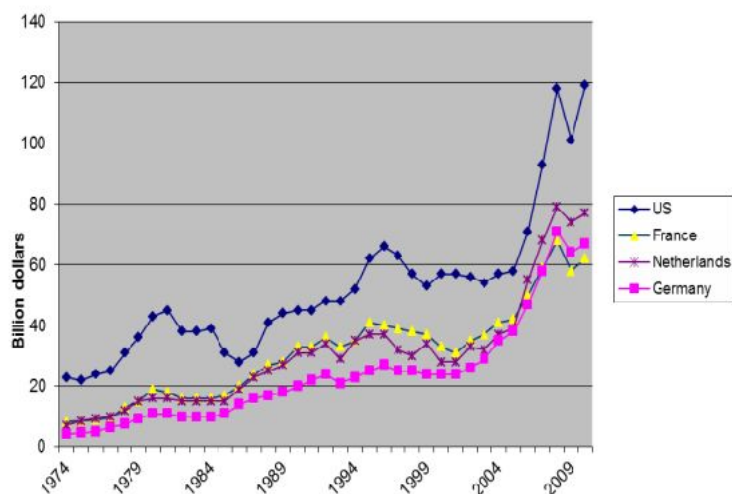
Between 1974 and 1996, world agricultural exports increased by \$20-50 billion per year, except during 1980-86. World agricultural exports reached a peak in 1980 (of \$234 billion) which was not surpassed until 1987. These years, 1980-87, coincided with a world-wide economic recession, large crops in many countries, and low agricultural prices. There was also a general increase in non-tariff barriers for agricultural products which reduced trading volumes[3]. These increased trade restrictions and reduced export levels lead to the inclusion of agriculture in the Uruguay Round of the GATT, which is discussed later.

The value of world trade fell from 1996 to 2001 because of increased production in many countries, low/stagnant commodity prices and a recession during that time. Yet when exports began to grow again in 2002, their annual increases were much more pronounced – averaging an increase of \$90 billion per year. Those increases had a setback in 2009 and 2010 due to the world-wide recession, but they have continued to climb steeply since. Future increases in world agricultural trade might not keep such a torrid pace, but signs point to continued increases due to the same demand pressures mentioned earlier, production issues in some countries (involving land or water scarcity), and increased production in some countries.

The U.S. has consistently been the leading agricultural exporter in the world (Figure 1.2). Its exports typically account for 12 to 19 percent of world exports, though there are cyclical patterns. During the mid-1970s through the mid-1980s the U.S. accounted for 15 to 19 percent of exports, but in most other years it has been somewhat below these levels. The U.S. has accounted for 10 percent of world agricultural exports since 2002 because of increased exports by other countries[4].

France had historically been the second-leading agricultural exporter, but it was overtaken by Netherlands in 2007, Germany in 2008, and Brazil in 2010 (Table 1.3). France is now the fifth leading agricultural exporter. A high percentage of the agricultural exports from these countries is intermediate and processed agricultural products which are traded within Europe. The table also shows agricultural exports from the E.U.-27 (the 27 members of the European Union) at \$133 billion. Geographic proximity and free trade among many European countries encourages these exports. There is also much more commonality among European countries concerning consumer tastes, food cultures, and food marketing systems.

**Figure 1.2 Agricultural Exports from Leading Countries**



**Table 1.3 Leading Agricultural Exporters, in billion dollars.**

	2008	2009	2010	2011		
United States			\$118.3	\$101.0	\$118.8	\$139.9
Netherlands			\$79.0	\$74.3	\$77.3	\$89.3
Germany			\$70.8	\$63.6	\$66.7	\$80.3
Brazil			\$55.4	\$53.0	\$62.1	\$79.6
France			\$68.0	\$57.5	\$61.7	\$73.9
China			\$30.2	\$29.6	\$36.2	\$52.3
Belgium			\$41.1	\$36.1	\$36.7	\$42.9
Italy			\$37.1	\$33.4	\$36.0	\$41.0
Canada			\$37.0	\$31.1	\$34.7	\$41.0
Spain			\$36.5	\$32.5	\$35.2	\$40.9
Argentina			\$35.7	\$26.7	\$32.8	\$43.2
Indonesia	\$27.9	\$21.2	\$30.7	\$41.9		
Malaysia	\$25.0	\$18.4	\$25.9	\$35.7		
Australia			\$24.1	\$21.6	\$26.6	\$32.7
Thailand	\$23.8	\$20.5	\$25.9	\$36.8		
United Kingdom	\$25.0	\$22.0	\$24.3	\$28.8		
EU-27			\$115.9	\$101.2	\$118.0	
	\$133.0					
World Total			\$1,059.9	\$950.1	\$1077.9	\$1313.9

Source: FAO, United Nations; EU-27 from Eurostat database

Countries which specialize in bulk agricultural products were more important exporters in the 1960s and 1970s. In 1965, Australia was the second-leading agricultural exporter, with Canada and Argentina ranked fifth and sixth, respectively, behind France and Netherlands. However, the tremendous growth in processed food trade has encouraged export growth from processed food companies in France, Netherlands, and Germany. Brazil and China have increased their agricultural exports greatly in recent years; increasing their respective rankings. Bulk agricultural exports have had a renaissance of sorts because countries have food and feed processing capabilities but they do not have sufficient raw ingredients. This has stimulated exports by Brazil, China, and the United States.

The leading agricultural exporting countries are also leading agricultural importers, which indicate the diversity of agricultural production (Table 1.4). In 2007, the U.S. was the leading agricultural importer, followed by Germany, the United Kingdom, China and Japan. Since 1996 agricultural imports by Japan have stagnated and imports by China have soared. In both cases, demographics and income changes have been the major causes. If the E.U. - 27 is considered as a single unit, it is the leading agricultural importer with \$139

billion in 2013 but China is close behind at \$128. The prominence of European countries as importers is further evidence that proximity and free trade have an important role in agricultural trade.

The next section gives a brief introduction to world trade in some of the most important agricultural products. The leading exporters and importers are given for these products and some trade values are presented. One can obtain more detailed information from the FAO ([www.fao.un.org](http://www.fao.un.org)), which is the source of all data presented in the following section. Their definitions of products are often different than individual country definitions; however, they report data that are consistent across all countries. Their data on meat trade is different than the U.S. and does not include many categories of meat, so FAO data are different than USDA data.

**Table 1.4 Leading Agricultural Importers, in billion dollars.**

	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>		
China	\$66.9	\$58.0	\$81.4	\$128.3		
United States			\$87.5	\$78.4	\$89.3	\$107.1
Germany			\$83.0	\$73.8	\$77.0	\$ 95.0
Japan	\$56.7	\$47.6	\$53.8	\$ 68.5		
United Kingdom		\$58.4	\$50.9	\$53.1	\$ 59.8	
France			\$53.1	\$48.0	\$48.7	\$ 55.6
Netherlands			\$49.5	\$45.1	\$47.4	\$ 57.8
Italy			\$44.8	\$39.4	\$42.6	\$ 49.9
Belgium			\$37.5	\$32.3	\$32.2	\$ 39.1
Russian Federation			\$31.4	\$26.7	\$31.8	\$ 37.2
Spain			\$31.6	\$27.2	\$27.8	\$ 32.9
Canada	\$25.6	\$24.3	\$27.2	\$ 31.0		
EU-27	\$128.9		\$106.8	\$111.1	\$138.8	
World Total			\$1104.8	\$986.7	\$1103.5	\$1350.7

Source: *FAO, United Nations; EU-27 from Eurostat database*



## Commodity Highlights

The U.S. is the leading wheat exporting country, accounting for \$11.1 billion in 2011; followed by France, Canada, Australia, and Russia (at \$6.7 billion, \$5.7 billion, \$5.7 billion, and \$3.7 billion, respectively). Exports from France and Australia have been increasing in recent years while the other countries export pattern fluctuates more. Wheat exports patterns have been distorted heavily in the past due to subsidies by the U.S. and Europeans. Trade talks have induced lower export subsidies recently, while production increases in the Former Soviet Union have made Russia and Kazakhstan important exporters (and maybe Ukraine someday). Wheat imports are dispersed among many countries but Egypt (\$3.2 billion), Indonesia (\$2.2 billion), EU-27 (\$2.1 billion excluding intra-EU trade), and Brazil (\$1.8 billion) are leaders. If intra-EU trade is not excluded the EU-27 imported \$10.0 billion in 2011. Other important importers are Turkey, Mexico, and Nigeria.

The U.S. normally accounts for 40 - 50 percent of world corn exports. In 2011, U.S. corn exports totaled \$14.0 billion while world exports totaled \$33.7 billion. Argentina, Brazil, and France are also important corn exporters. All corn exporters have increased their exports in recent years. Corn importers are more diversified, with Japan being the leading destination in 2011 (\$5.4 billion), followed by Mexico, Korea, Egypt (each with \$2-3 billion).

World soybean exports were dominated by the U.S. until the late 1990s, but Brazil and Argentina have become increasingly important over the years. The U.S. exported \$17.6 billion of soybeans in 2011, while Brazil, the second-leading exporter, exported \$16.3 billion. Brazil has never exported more raw soybeans than the U.S., but their exports have been growing faster than the United States' exports. Argentina is also a large soybean exporter (\$5.5 billion in 2011). Argentina and Brazil also export a great deal of soybean meal and oil (the result of crushing soybeans). In 2011, Argentina exported \$9.9 billion in soybean meal and \$5.2 billion in soybean oil; Brazil exported \$5.7 billion in meal and \$2.1 billion in oil; and the United States exported \$2.7 billion in meal and \$1.3 billion in oil. China dominates soybean imports, accounting for \$29.7 billion in 2011, which was more than 55% of world imports. Their import growth has been astounding. They only imported \$1.2 billion in 1999, but their import growth since 2006 has been particularly steep.

Beef is the leading meat traded in the world (\$26.7 billion in 2011), followed closely by poultry (\$22.1 billion) and pork (\$16.6 billion). Growth in poultry trade has been expanding faster than the other two meats. Australia and Brazil are number one and two, in beef exports, each accounting for \$4.2 billion in 2011. The U.S. beef industry, which is the third leading exporter, has recovered from the 2003 BSE incident, but it hasn't been the leading beef exporter since that time.

Brazil is also the leading poultry exporter (at \$7.1 billion in 2011), with the U.S. second at \$4.0 billion and Netherlands third at \$2.2 billion). Brazil's poultry exports have been growing very fast, more than doubling in the past six years. The United States is the leading pork exporter at \$4.7 billion and their exports have more than doubled in the past five years.

Denmark is the second leading pork exporter at \$2.5 billion, followed by Canada (\$2.3 billion), Brazil (\$1.2 billion) and Netherlands (\$1.0 billion). Pork exports from Denmark and Netherlands have fallen in recent years because of environmental constraints on production.

The U.S. is the leading destination for beef (\$2.7 billion in 2011), followed closely by Japan (\$2.6 billion), Germany (\$1.6 billion) and Italy (\$1.2 billion). The imports into all four of these have been stagnant in recent years due to consumption switching away from beef. Japan has shifted toward importing pork, where it is still the leading pork importer (\$5.2 billion in 2011), followed by the Italy (\$1.9 billion), China (\$1.6 billion) and Germany (\$1.3 billion). China has grown to become the leading poultry importer (\$2.7 billion in 2011), followed by Japan and the United Kingdom (each with \$1.5 billion).

## U.S. Agricultural Trade by Country and Commodity

As seen earlier, the U.S. is the leading agricultural exporting country in the world. Table 1.5 gives a product breakdown of U.S. agricultural exports for 2009-2013. The rankings for these products are sensitive to the product definitions, but the table gives a good overview of U.S. agricultural exports.

Bulk commodities, such as soybeans, coarse grains, wheat and cotton continue to dominate U.S. agricultural exports in 2013. U.S. exports of soybeans peaked in 2012, while exports of coarse grains peaked in 2011. Wheat exports have grown by 94% from 2009 to 2013 and red meat (particularly pork) exports have also grown rapidly (66%); dairy exports have nearly tripled. These are unusually large increases for these products and it is unclear whether these levels will be sustained. Yet there are indications that the relative price of food will increase in the future because of land, water, and other natural resource constraints (even though many prices are depressed at this writing). At this point it is unclear whether technology will be able to sustain increases in production that will allow prices to remain at present levels or below.

### *Discussion Box 1.1 U.S. Department of Agriculture's Product Classifications.*

*The U.S. Department of Agriculture classifies agricultural products into various categories. Bulk commodities have a value of less than \$400 per metric ton. Intermediate products have been processed in some way, but are not ready for ultimate consumption. Consumer-oriented products are ready for ultimate consumption (they may have been processed in some way). At times the terms "manufactured" or "processed" food is used in this book. These terms include any agricultural product that has been materially transformed in some way. It includes intermediate and some consumer-oriented products.*

**Table 1.5 U.S. Agricultural Exports by Major Products, 2009-13 in billion dollars.**

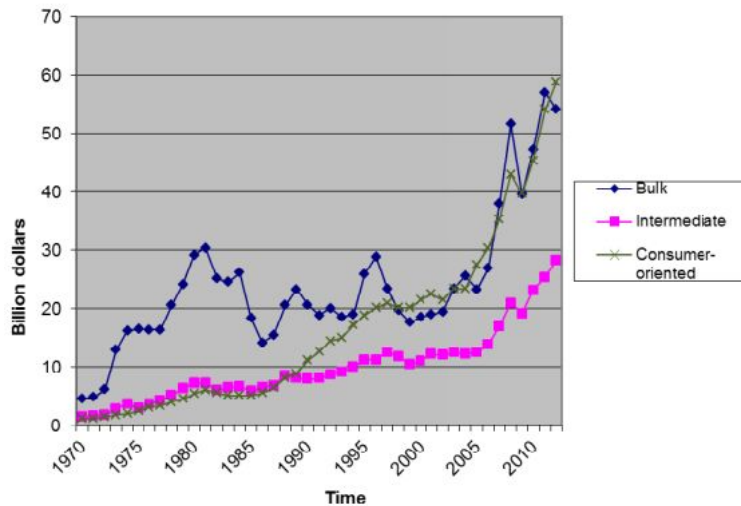
	2009	2010	2011	2012	2013
Soybeans	\$24.61	\$16.42	\$21.56	\$18.56	\$17.56
Red Meat	\$11.83	\$7.37	\$12.22	\$8.86	\$11.53
Coarse Grains	\$9.89	\$9.42	\$6.95	\$10.58	\$14.68
Wheat	\$8.16	\$5.38	\$10.45	\$6.76	\$11.15
Tree Nuts	\$6.40	\$3.70	\$7.53	\$4.42	\$5.32
Dairy	\$5.21	\$2.27	\$6.71	\$3.71	\$4.82
Cotton	\$6.25	\$3.37	\$5.63	\$5.90	\$8.47
Fresh Fruit	\$4.94	\$3.51	\$5.07	\$3.98	\$4.50
Poultry Meat	\$5.46	\$4.19	\$5.52	\$4.19	\$4.91
<b>Total</b>	<b>\$98.45</b>	<b>\$115.82</b>	<b>\$136.44</b>	<b>\$141.41</b>	<b>\$144.38</b>

Source: *Economic Research Service, U.S. Department of Agriculture*

Figure 1.3 shows U.S. exports of bulk, intermediate and consumer-oriented exports since 1970. Note the steady increase in the latter two categories, while the bulk category fluctuates greatly on a yearly basis. Yet bulk exports have had a steep upward trend since 2007 (except for the decline in 2009 and 2013). Exports of bulk commodities are more price sensitive, while markets for intermediate and consumer-oriented products are less susceptible to price competition. In the mid-1970s (1973-76), bulk exports accounted for over 70 percent

of U.S. agricultural exports. In the mid-1980s, bulk exports shrank to less than 55 percent of U.S. agricultural exports because of pricing pressures and the high value of the U.S. dollar. The early 1990s also saw the bulk export percentage shrink quickly to less than 45 percent of agricultural exports due to pricing pressures from a world-wide recession. The percentage of bulk exports reached a low in 1997 when they accounted for 41 percent of agricultural exports. In recent years, however, exports of all three agricultural categories have shot up tremendously because of increased world prices and production shortfalls in countries outside the U.S.

**Figure 1.3 U.S. Agricultural Exports by Category**



These U.S. agricultural exports reach almost every country of the world, but as Table 1.6 indicates, over 50 percent of them go to China, Canada, Mexico, and Japan. The North American Free Trade Agreement (and their proximity to the U.S.) allows easy access for U.S. exporters to Canada and Mexico, so they are usually the top two export markets for U.S. agriculture (the recession in Mexico had a big impact on its imports for 2009). Japan has a large, high-income population on a crowded, mountainous island where agricultural production potential is limited. It had been the largest importer of U.S. agricultural products for many years (and its imports have grown in recent years), but its aging population and slow economic growth have made it a mature market for the U.S. China has provided a fast-growing market for U.S. agricultural exports during the last decade and will likely continue to grow rapidly in the future. It became the leading market for U.S. food exports in 2010. China's fast economic growth, huge population, and high income elasticity of demand for food make it a great market for the U.S. The European Union countries account for less than 10 percent of U.S. exports and it is likely that the percentage will fall over time. They receive their food needs internally and from other countries close to them.

**Table 1.6 Leading Destinations for U.S. Agricultural Exports, 2009-13 in billion dollars.**

	2009	2010	2011	2012	2013		
PR of China			\$ 13.11	\$ 17.52	\$ 18.85	\$ 25.86	\$
Canada			\$ 15.73	\$ 16.90	\$ 19.00	\$ 20.63	
Mexico		\$ 12.93	\$ 14.60	\$ 18.37	\$ 18.92	\$ 18.11	
Japan			\$ 11.07	\$ 11.80	\$ 14.07	\$	
E.U.-27			\$ 7.45	\$ 8.91	\$ 9.66	\$	
Korea	\$ 3.92	\$ 5.31	\$ 6.97	\$ 6.03	\$ 5.26		
Taiwan			\$ 2.99	\$ 3.19	\$ 3.62	\$ 3.21	\$
Hong Kong			\$ 2.01	\$ 2.80	\$ 3.32	\$ 3.40	\$

Indonesia	\$ 1.80	\$ 2.25	\$ 2.82	\$ 2.49	\$
2.82					
Turkey	\$ 1.50	\$ 2.10	\$ 2.46	\$ 1.99	
\$ 2.16					
Egypt	\$ 1.35	\$ 2.10	\$ 2.51	\$ 1.87	\$
1.65					
Total	\$ 99.95	\$ 117.91	\$ 138.89	\$ 143.40	
	\$ 146.54				

Source: *Economic Research Service, U.S. Department of Agriculture*

The U.S. is largest importer of agricultural products (importing \$107.1 billion in 2011 according to the FAO) – ahead of China (\$95.1 billion), Germany (\$95.0 billion), and Japan (\$68.4 billion). Table 1.7 gives a product breakdown of U.S. agricultural imports for 2009 - 2013. Again, the rankings for these products are sensitive to the product definitions. Seafood is by far the largest imported item into the United States. After that, intermediate and consumer-oriented products account for a much larger percentage of U.S. agricultural imports than exports. Wine, beer, fresh fruits, snack foods, processed fruits and vegetables, fresh vegetables, and red meats account for almost 45% of U.S. agricultural imports and intermediate products account for another 20 percent of agricultural imports. Many of the bulk agricultural products that are imported are not produced in significant amounts within the U.S. (coffee, rubber, cocoa, and tea), meaning that they are non-competitive imports.

U.S. agricultural imports each of the four top origins (Canada, Mexico, China, and Italy) have been growing consistently in recent years and most of those imports are processed food items (Table 1.8). Leading Canadian exports to the U.S. include red meat, snack foods, processed fruits and vegetables, vegetable oils, and grains. Mexico exports large quantities of vegetables, fruits, beer, snack foods, and processed fruits and vegetables to the U.S. China supplies processed fruits and vegetables, and juices; Italy mostly supplies wine. Some other leading import-supplying countries for the U.S. have climates that are substantially different and the import items are not produced significantly in the U.S. -- from Indonesia, the U.S. imports mostly rubber, cocoa, and coffee; from Brazil, the U.S. imports coffee, tobacco, nuts, and orange juice.

**Table 1.7 U.S. Agricultural Imports by Major Products, 2009-13, in billion dollars.**

	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>
Seafood	\$13.97	\$14.56	\$16.50	\$ 16.51	\$ 17.87
Wine and Beer	\$ 7.36	\$ 7.80	\$ 8.45	\$ 8.83	\$ 9.04
Fresh Fruits			\$ 6.16		\$ 6.94
8.60					\$ 7.29
Snack Foods			\$ 5.04		\$ 5.80
7.18					\$ 6.44
\$ 6.78					\$
Proc. Fr and Veg	\$ 5.13	\$ 5.4	\$ 6.33	\$ 6.75	\$ 6.92
Fresh Veg	\$ 4.33	\$ 5.36	\$ 5.91	\$ 5.92	\$ 6.80
Red Meat			\$ 3.73		\$ 4.31
6.12					\$ 4.82
\$ 5.28					\$
Veg Oils	\$ 3.57	\$ 4.10	\$ 6.30	\$ 5.67	\$ 5.47
Raw Coffee	\$ 3.38	\$ 4.05	\$ 6.91	\$ 5.81	\$ 4.67
Rubber	\$ 1.29	\$ 2.83	\$ 4.79	\$ 3.40	\$ 2.58
Essential Oils	\$ 2.30	\$ 2.46	\$ 2.57	\$ 2.56	\$ 2.84
Live Animals	\$ 1.87	\$ 2.22	\$ 2.18	\$ 2.48	\$ 2.50
Total	\$ 71.69	\$81.86	\$98.95	\$102.92	\$104.23

Source: *Economic Research Service, U.S. Department of Agriculture*



**Table 1.8 Leading Origins for U.S. Agricultural Imports, 2008-12, in billion dollars.**

	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>						
						Canada	\$ 14.71	\$16.24	\$18.92	\$ 20.23	\$ 21.75
						Mexico	\$ 11.37	\$13.58	\$15.83	\$ 16.40	\$ 17.68
PR of China	\$ 2.88	\$ 3.37	\$ 3.99	\$ 4.53	\$ 4.42						
Italy	\$ 2.87	\$ 2.94	\$ 3.39	\$ 3.51	\$ 3.75						
Indonesia	\$ 1.79	\$ 2.89	\$ 4.29	\$ 3.35	\$ 3.12						
Brazil	\$ 2.43	\$ 2.89	\$ 4.06	\$ 3.56	\$ 3.40						
Australia	\$ 2.32	\$ 2.31	\$ 2.36	\$ 2.68	\$ 2.75						
Chile	\$ 2.14	\$ 2.29	\$ 2.37	\$ 2.46	\$ 2.87						
Ireland	\$ 2.08	\$ 2.13	\$ 2.30	\$ 2.30	\$ 2.52						
France	\$ 1.69	\$ 1.82	\$ 2.21	\$ 2.39	\$ 2.49						
Thailand	\$ 1.57	\$ 2.04	\$ 2.63	\$ 2.41	\$ 2.24						
Colombia	\$ 1.77	\$ 1.98	\$ 2.47	\$ 2.14	\$ 2.20						
Netherlands	\$ 1.87	\$ 2.01	\$ 2.09	\$ 2.08	\$ 2.01						
						E.U.-27	\$ 13.38	\$14.35	\$16.07	\$ 16.86	\$ 17.56
						Total	\$ 71.68	\$81.86	\$98.95	\$102.92	
							\$104.22				

Source: *Economic Research Service, U.S. Department of Agriculture*

## Important Issues in Agricultural Trade

Barriers to international trade and their impacts have always been important issues for agriculture, and their importance has heightened over the years. Much of this importance stems from the trend toward non-tariff barriers for agricultural products, which had become increasingly prevalent during the 1980s. The Uruguay Round of the GATT was very successful in reversing this trend toward increased restrictions on agricultural trade and the new World Trade Organization (WTO) has new rules that will help preserve this freer trade environment. Nonetheless, freer trade in agriculture continues to be an important issue.

Three chapters of this book (Chapters 2, 3, and 4) present the framework to analyze the gains from trade and impacts of import and export barriers. These chapters provide the basis for the rest of the text. Chapter 6 deals specifically with the GATT and WTO; paying attention to the recent Uruguay Round and explaining the difficulties in the Doha Round.

Technical barriers to agricultural trade have increased tremendously in the past decade. They involve sanitary and phytosanitary regulations and other rules for quality, packaging, and labeling. Often these regulations are enacted to enhance food safety or to increase information flows to consumers, but some people argue that these barriers are often intended simply as hurdles to discourage imports. There are rules and operating procedures to distinguish those technical barriers that have a true scientific or economic rationale from those that do not. Disputes associated with technical barriers will be crucial in the years ahead as standard tariff and non-tariff barriers fall or are eliminated. Chapter 5 deals with the issues of technical barriers to trade.

Despite recent multilateral successes in reducing trade barriers, many new free trade zones have been established during the last three decades. The first major free trade area, the European Common Market, has now expanded into an economic union that covers most of Western Europe and includes free movement of labor and a common currency. For the United States, a major new era in agricultural trade came about when the North American Free Trade Area (NAFTA) was established in 1994. There are many trade issues that spring from these free trade areas and they are covered in Chapter 7, with a special reference with respect to NAFTA and what it means to U.S. agriculture.

Changes in the world financial system have had tremendous impacts on agricultural trade. The change from a fixed exchange rate system to a flexible system in 1973 and the concomitant increase in currency flows among countries helped stimulate heightened agricultural trade flows. World financial markets continue to expand exponentially and an understanding of the relationship between exchange rates, interest rates, and trade is essential in today's increasingly integrated world economy. There are entire books that cover these topics (and other topics in international finance) in great detail. Chapter 8 of this text covers the basics of these world macroeconomic phenomena and their effects on agricultural trade.

The environment and its relation to trade and trade policy is an emerging topic of great significance. Chapter 9 covers issues environmental issues. As trade barriers fall throughout the world, differences in environmental standards may play an enhanced role in determining the production and trade pattern among countries. Chapter 9 covers conceptual frameworks that incorporate environmental standards in trade models. It also explains how these environmental issues are covered within the new WTO and other international organizations whose role is to increase cooperation among nations.

Chapter 10 and 11 provide case studies of European Union and Chinese agriculture, respectively. The EU case study is chosen because the U.S. and Europe are embroiled in so many agricultural trade disputes. It is worthwhile to study to background of European agriculture to understand their stance on these issues. The E.U. has also been instrumental in establishing trade barriers that are used by other countries, so again, familiarity their policy dynamic is fundamental to understanding the international debates on agricultural policy. The case study on China highlights the tremendous transformation that has taken place there and its importance for agriculture. As seen in this chapter, China is now a very important exporter and importer in the world market and its prominence only increase in the future.

Agricultural trade has expanded greatly over the last three decades, but sales of multinational food corporations (food firms that own facilities in more than one country) have expanded even faster. In today's world, one must understand the operations of these multinational food firms in order to comprehend the present and future trends in agricultural trade. Agricultural exporters, especially food processors, increasingly find their products competing in international markets with large-scale companies such as Nestles, Unilever, and PepsiCo, and others that process local agricultural ingredients in their facilities throughout the world. Chapter 12 covers the operations of multinational firms in general and multinational food firms in particular.

Discussion of the operations of multinational firms leads naturally into a general discussion of *competitiveness*, which has been an important "buzz word" in the business and political arenas in recent years.

Businesses are seeing their sales erode quickly as dynamic markets change rapidly because of technology, tastes, and regulations. Governments are struggling with policies to increase the competitiveness of their industries. Chapter 13 covers the basic concepts of competitiveness and how they relate to the agricultural and food trade.

The last two chapters of the book (14 and 15) cover the elements involving in export market development. The analyses needed for a reasoned assessment of a firm's capability for competing in export markets is covered in chapter 14. The development of a strategy needed to carry out the export marketing plan is covered in chapter 15. These firm-level considerations in international trade are vitally important for success by firms.



## Summary

1. International trade has become increasingly important to U.S. agriculture since World War II. In the 1950s, exports accounted for 3.0% of GDP, while in 2014 exports accounted for 13.5% of GDP. Imports accounted for an even larger percentage of GDP in both years.
2. Trade liberalization, through the GATT and WTO, has provided an important stimulus to international trade in all goods. The move to a floating exchange rate system also coincided with a large increase in U.S. agricultural exports.
3. U.S. agricultural exports grew rapidly in the 1970s, but they stagnated throughout the 1980s. Agricultural export growth reemerged in the 1990s and U.S. agricultural exports have grown rapidly since. U.S. agricultural imports have increased steadily since World War II.
4. The U.S. is the leading agricultural exporter in the world. Other important agricultural exporters (in order) are Netherlands, Germany, and Brazil. China is the leading agricultural importer in the world, followed by the U.S., Germany and Japan.
5. The U.S. exports agricultural products to most countries of the world, but 44% of U.S. agricultural exports go to China, Canada, and Mexico. U.S. agricultural exports to China have grown very rapidly in the last decade.

## Questions

1. What factors have caused U.S. exports and imports to increase so rapidly relative to overall economic activity? Will these factors continue in the future?
2. Will U.S. agriculture continue to rely on exports to fuel farm income growth? Will our agricultural exports become more concentrated in certain products in the future? Will imports become more diverse?
3. What will the U.S. agricultural export pattern be in 2035 and how will that pattern affect U.S. agriculture?
4. In your opinion, what is the most important agricultural trade issue? Why?

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## Chapter 2 Gains from Trade

Notice that the title of this chapter is “gains from trade.” It is not titled “gains from exports” and it doesn’t involve “losses from imports.” Countries gain from exporting and importing. This may not be well-known in the popular press, but this result is crucial for practicing economists to understand. Trade -- exporting and importing -- is mutually beneficial for all countries. The gain from trade is one of the fundamental propositions that all economists agree upon, so it is important that students of the subject understand the concepts behind this proposition.

This chapter begins with the concept of comparative advantage and gains from trade in a simple, two-country, two-good world. This is where the analysis begins in international economics texts. Yet most of the chapter deals with one good and two countries because this is the model which is more commonly used in agricultural trade analysis. The reason that the one-good case is more commonly used than the two-good case is that agricultural economists are often interested in the effects of trade policies on trade flows, which is most easily analyzed in a one-good case.

## Simple Comparative Advantage

Introductory analysis of gains from international trade normally begins with the concept of comparative advantage, which dates back to British economist David Ricardo (1772-1823). The comparative advantage concept highlights the proposition that relative productivity between countries is more important than absolute productivity in determining trade patterns. The production possibilities frontier (PPF) is an important concept for comparative advantage and gains from trade.

Consider the trade pattern between the United States and France, assuming there are two goods in the economy, bread and wine. Both goods require similar inputs, land, labor, capital, and so on, that are assumed in fixed supply in each country. Further assume that resources move easily between producing these two goods and that the goods are not distinguished by country. The production functions for the U.S. are such that if all such inputs are used for production of bread, 120 units of bread will be produced; whereas 40 units of bread would be produced if all inputs are used for bread production in France. If the U.S. and France used all of their resources in the production of wine, they would produce 30 units and 20 units, respectively. Table 2.1 gives the range of production possibilities available to each country, given their available resources.

**Table 2.1 Production Possibilities Data for France and the U.S.**

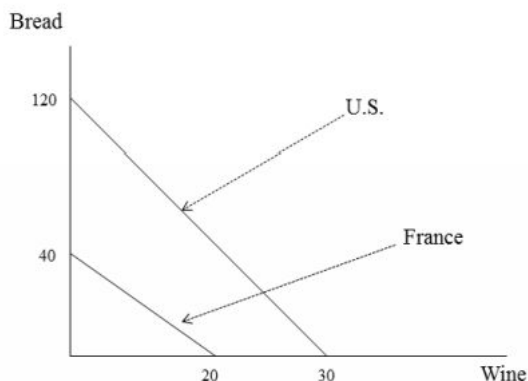
U.S.		France	
<u>Bread</u>	<u>Wine</u>	<u>Bread</u>	<u>Wine</u>
120	0	40	0
80	10	20	10
40	20	10	15
0	30	0	20

Notice that the U.S. can produce more bread or wine than France because they have more abundant resources (land, labor, and capital). The U.S. is said to have an *absolute advantage* in production of bread and wine. Absolute advantage is irrelevant for international trade because it only gives an indication of the country's size or total resource base. Despite the fact that the U.S. has an absolute advantage for each good, both countries can gain from trade because their marginal rates of product transformation (the rate at which one product must be sacrificed to produce another) vary for the two commodities. In the U.S. one must give up 4 units of bread for every unit of wine, while in France one must give up 2 units of bread for every unit of wine. This gives France a *comparative advantage* in production of wine because its resource base is such that its opportunity costs (in terms of bread) are lower for wine than in the U.S. The opportunity cost for bread is lower in the U.S. These different opportunity costs by country bring about the gains from trade.

If there is no trade between France and the U.S., each country must consume what it produces. Thus, the domestic price ratios for bread and wine, which give the signals for what should be produced and consumed, are consistent with the PPFs (assuming that some of each good is consumed). Without trade, the price of wine must be 4 times the price of bread in the U.S. and 2 times the price of bread in France; wine is relatively expensive in the U.S. If wine cost \$1 in the U.S., bread would cost \$0.25; if wine cost \$1 in France, bread would cost \$0.50.

The production possibilities frontiers associated with Table 2.1 make it easier to see comparative advantage. Figure 2.1 shows the PPFs for each country. The PPF for the U.S. lies upward and to the right of the PPF for France, which indicates that the U.S. has an absolute advantage in production of bread and wine. Yet, because the slope of the PPF for the U.S. is different than the slope for the France, welfare-enhancing trade can take place. Without trade, each economy is forced to consume somewhere along their PPF. Thus, the PPF defines what the price ratios will be between bread and wine – that is prices are determined by the production trade-off between the goods

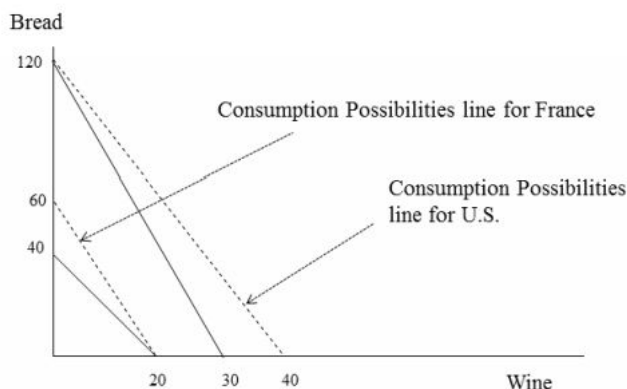
Figure 2.1 Linear Production Possibilities Frontiers for France and the U.S.



Suppose trade between the U.S. and France is allowed and the international price for wine is 3 times the price of bread (between the price ratios for the U.S. and France). Profit-maximizing producers in France would choose to produce only wine, while profit-maximizing producers in the U.S. would choose to produce only bread. Because trade is possible, French wine producers can trade some of their wine for bread made in the U.S. (and vice versa). This trade occurs at the international price ratio (or international terms of trade) of 3:1.

The international terms of trade help define consumption possibilities. These consumption possibilities lines define combinations of the two goods that the country can choose to consume based on its production level and the international terms of trade. One can think of them as the budget constraint for the country because it gives the value of the country's production. Figure 2.2 shows the consumption possibilities for each country (the dotted lines). Both countries clearly gain because their consumption possibilities lines lie above their PPFs, allowing each country to consume more of each good than when trade was not allowed.

Figure 2.2 Consumption Possibilities for France and the U.S.



Any wine/bread price ratio between 4 and 2 will result in France specializing in wine production (because it maximizes France's income from production) and the U.S. specializing in bread production (because it maximizes the U.S.'s income from production). However, the equilibrium price has ramifications on national income. If the international price of wine was 3.99 times the price of bread, incomes would be higher in France, and a price of wine that was 2.01 times the price of bread would make incomes higher in the U.S. The consumption possibilities lines associated with those price ratios would reflect those income levels (and the ability to consume the two goods). It would be very steep with a price ratio (price of wine,  $P_W$ , divided by the price of bread,  $P_B$ ) of 3.99:1 and be more flat with a price ratio of 2.01:1.

The gains from trade in this analysis can be measured in terms of utility or added consumption of the two goods, as shown in Figure 2.3. Assume that the new terms of trade allow the U.S. to consume 20 units of wine and 60 units of bread (point B), while the terms of trade allow France to consume 10 units of wine and 30 units of bread (point A). The net welfare gain to the U.S. can be measured in terms of wine by moving

back to the U.S.'s original PPF and finding that the U.S. can consume 5 additional units of wine, while leaving their bread consumption at 60 units. The net welfare gain from trade to France can be measured in terms of bread by going back to France's original PPF and finding that France can consume 10 additional units of bread, while leaving their wine consumption at 10 units. Welfare gains can be measured in units of either good.

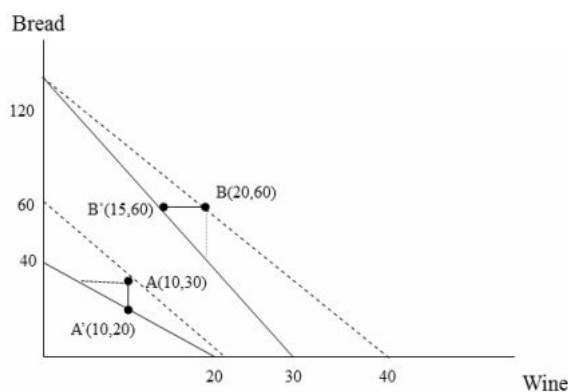
*Explanation Box 2.1. Production Possibilities Frontiers*

*Production possibilities frontiers (PPFs), which are derived from production functions for goods, trace the maximum output that can be obtained from an economy assuming that all resources are fully employed. They are analogous to the country's budget constraint, but one must remember that they are in quantity space (the axes are quantities of the two goods). Movement along the PPF shows the effect of moving inputs from production of one good to another. They are usually concave to the origin, as shown in Figure 2.4, because the economy experiences diminishing marginal rates of transformation. This technical term means that as more resources are put into production of a good, the marginal productivity of those resources declines; thus an economy is getting less output per unit of input as more input is used.*

*Not all inputs are equally suited for production of wheat (bread) and grapes (wine), especially when land and labor are involved. Consider the point in Figure 2.4 where the U.S. produces 120 units of bread and no wine. If the country was going to begin producing wine, it would use the inputs (especially land and labor) that are best suited for wine production for those first units of wine production – generating a relatively large amount of wine with little bread production foregone. As more inputs are put into wine production, those inputs will be less suited to wine production than the first inputs, so less wine will be forthcoming.*

*Figure 2.1 shows a relationship where all inputs are equally productive in wine and bread production (because the PPF is linear). However, if the inputs that are most suited to wine production are taken out of bread production first, the PPF will lie above the straight line depicted in Figure 2.1 (as shown in Figure 2.4). Thus, the PPF will be concave (or bowed outward).*

Figure 2.3 Consumption and Gains Given a 3:1 Price Ratio



*Explanation Box 2.2. Indifference*

*Curves*

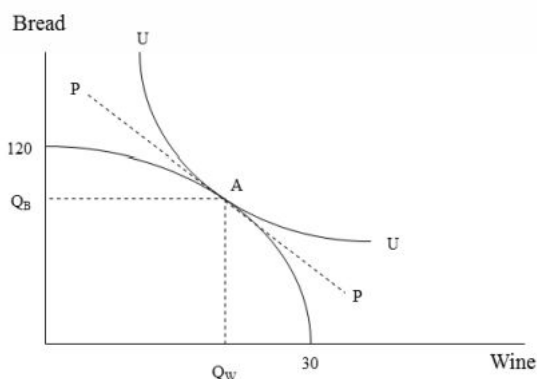
*Indifference curves trace consumption points where consumers are indifferent about a consumption bundle, so they are also in quantity space. The indifference curve shows the willingness of consumers to substitute one good for another, so indifference curves reflect tastes and preferences of consumers. Indifference curves are always convex to the origin (as shown in Figure 2.4) because of the law of diminishing marginal rate of substitution. This law says that as one consumes more of a product, the marginal utility from consuming an additional unit falls.*

*There are an infinite number of indifference curves, each depicting a different level of utility. As one moves upward and to the right in Figure 2.4, the utility associated with the indifference curve increases. Society's goal is to get to the indifference curve with the highest utility (or the one that lies the furthest upward and to the right).*

When there is no trade, the equilibrium production (and consumption) point is at A in Figure 2.4, corresponding to  $Q_B$  units of bread and  $Q_W$  units of wine, where the indifference curve  $UU$  is tangent to the PPF. This equilibrium is reached because relative prices in the economy are consistent with the line segment  $PP$ , which has a slope of  $-P_W/P_B$ . This relative price gives producers the signal to use their resources to obtain outputs  $Q_B$  and  $Q_W$ . This relative price also gives consumers the signal on relative scarcity, which generates the same point for consumption. Given the income constraint that the U.S. faces (as shown by the PPF), there is no indifference curve that lies further upward and to the right, so welfare in the U.S. is maximized at  $Q_B$  and  $Q_W$ .

If trade is introduced and there are no barriers to trade, the constraint that the U.S. consumes along its PPF is relaxed because imports and exports are allowed. The  $PP$  line segment is no longer relevant because the U.S. can trade at the world relative price, which is likely different than  $PP$ . If the U.S. is a small country, meaning that it can buy or sell any amount of a good without affecting the world price (an assumption that will be relaxed later), and the world relative price (or terms of trade) for bread is higher than the U.S. relative price without trade, the U.S. will export bread and import wine. Figure 2.5 shows this graphically.  $P'P'$  is the

Figure 2.4 U.S. Production and Consumption with Typical PPFs



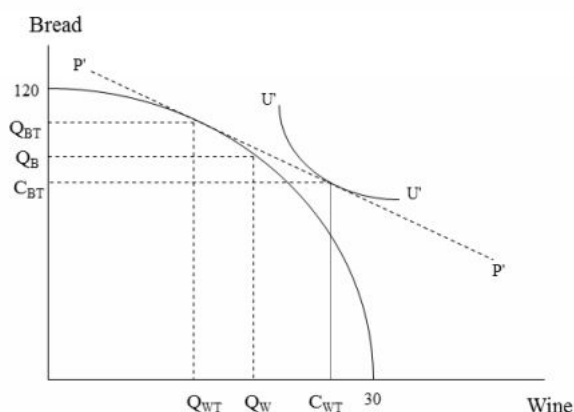
consumption possibilities line.

The world terms of trade (shown as  $P'P'$ ) are the key to the equilibrium with trade. Producers in the U.S. react to the new higher relative price of bread and increase their production (to  $Q_{BT}$ ). The only way they can produce more bread is to reduce their production of wine (which falls to  $Q_{WT}$ ). It is clear, though, that the new production point ( $Q_{BT}$  and  $Q_{WT}$ ) generates the maximum income for producers given the new terms of trade. Note that the U.S. does not specialize in production of bread because it has some resources that are well-suited for wine production.

Consumers will react to the new higher relative price of bread and they will choose to increase their consumption of wine and reduce their consumption of bread. They will maximize their welfare by consuming at  $C_{BT}$  for bread and  $C_{WT}$  for wine, where the new income constraint along  $P'P'$  is tangent to the indifference curve  $U'U'$ . This is clearly at a higher welfare level than before trade.



Figure 2.5 Production and Consumption With a Concave PPF



The production and consumption points must be on the world terms of trade segment to assure that there is balance of trade equilibrium (the value of imports is exactly equal to the value of exports). The world terms of trade line is the new budget constraint for the country, not the PPF. The world allows the U.S. to trade at the new terms of trade as long as the value of its exports equals the value of its imports. The world relative price reflects relative scarcity between bread and wine for the world. Because the U.S. is more productive relative to the rest of the world in bread production, opening up trade gives signals to the U.S. that it should produce more bread (and consume less bread).

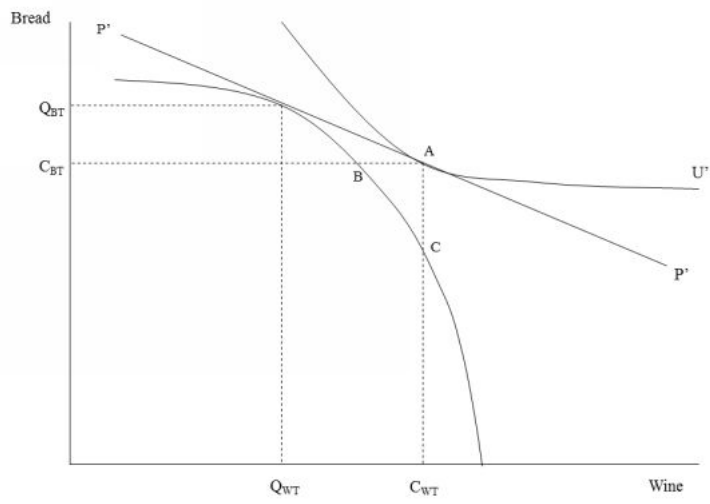
The gains from trade can be measured a number of ways. The first is simply to measure the difference in welfare between the two consumption points (without trade and with trade) -- that is measuring how far  $U''U'$  is beyond  $UU$  (the point where an indifference curve is tangent to the PPF). However, economists are not very good at assigning welfare values to the abstract notion of an indifference curve. Another way is shown in Figure 2.6 by measuring increased consumption of wine (or bread). In this figure, the consumption point after trade is opened is  $A$ . The gain from trade in terms of wine, relative to what could be consumed without trade, is  $A - B$ , whereas the gain from trade in terms of bread is  $A - C$ .[\[5\]](#)

#### *Discussion Box 2.1 Embargo on Iraq*

*In August 1990, the United Nations imposed a trade embargo on Iraq. No member of the United Nations (U.N.) could export to or import from Iraq because of Iraq's invasion of Kuwait and its failure to comply with U.N. weapons inspectors, who were trying to determine whether Iraq was storing or producing biological or chemical weapons. This was not a purely political matter, because the U.N. was using gains from trade (or the lack of gains because of the trade embargo) in order to encourage Iraq to comply.*

*In April 1995, the U.N. passed a resolution which allowed Iraq to sell up to \$2 billion in oil for food, medicine, and other humanitarian needs every six months. The trade embargo ended when the Saddam Hussein regime was ousted by the U.S.-led invasion in May 2003. There is no question that the trade embargo hurt the economic well-being of the Iraqi people. This unfortunate example, though, is evidence that world leaders realize that countries gain from trade.*

Figure 2.6 Gains From Trade to the U.S.



## Partial Equilibrium, One Good

Most international economics books focus on the two-good model and its ramifications on factor markets (such as labor and capital) because they are interested in the effects of trade on factor returns (wages and returns to capital). Agricultural economists tend to focus on output markets and investigate international trade issues as they impact the pattern of trade. Often this analysis of trade patterns is easier to envision in a partial equilibrium model (supply and demand analysis) with one good and many countries. The equilibrium is partial because it only includes the price for the good in question and holds all other good prices constant. This model is an excellent vehicle to show how changes in variables affect the equilibrium for the good in question.

Figure 2.7 shows typical supply and demand curves for bread for a particular country,  $S_d$  and  $D_d$ , where the  $d$  subscript denotes domestic. If there is no trade in bread, then the domestic price ( $P_B$ ) is where domestic supply equals domestic demand ( $Q_B$ ).  $P_B$  is called the autarkic or no-trade price. At  $P_B$  and  $Q_B$  producer surplus is the area  $BCD$ , consumer surplus is the area  $ABC$ , and their sum is maximized (as shown in Figure 2.7). In perfect competition, the supply of bread is the industry marginal cost curve and the demand for bread is the marginal benefit of bread, so  $P_B$  is where the marginal cost of producers equals the marginal benefit to consumers. Algebraically [6],

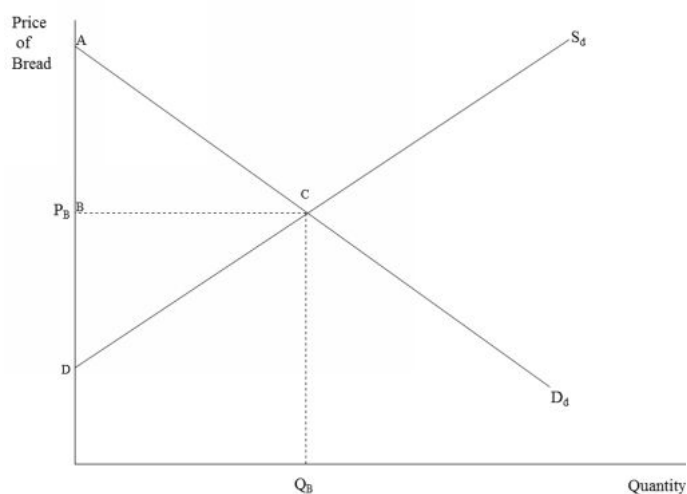
$$SB = f(P_B / \dots) \quad (2.1)$$

$$DB = g(P_B / \dots) \quad (2.2)$$

$$QB = \min(SB, DB) \quad (2.3)$$

$$\text{when surplus is maximized } QB = SB = DB \quad (2.4)$$

Figure 2.7 No-Trade Equilibrium for Bread



### Explanation Box 2.3. Consumer and Producer Surplus

*Consumer and producer surplus are common means of measuring welfare, especially in comparative static situations. Consumer surplus measures the welfare gain that consumers obtain from purchasing goods at prices that are below their worth. Given a typical (downward-sloping) individual demand function, the consumer is often willing to pay more for a product, than the market price. This net gain that consumers accrue is called a surplus. The area below the demand curve and above the market price is called consumer surplus. That area is the sum of gains that consumers obtain but do not pay for through the market price.*

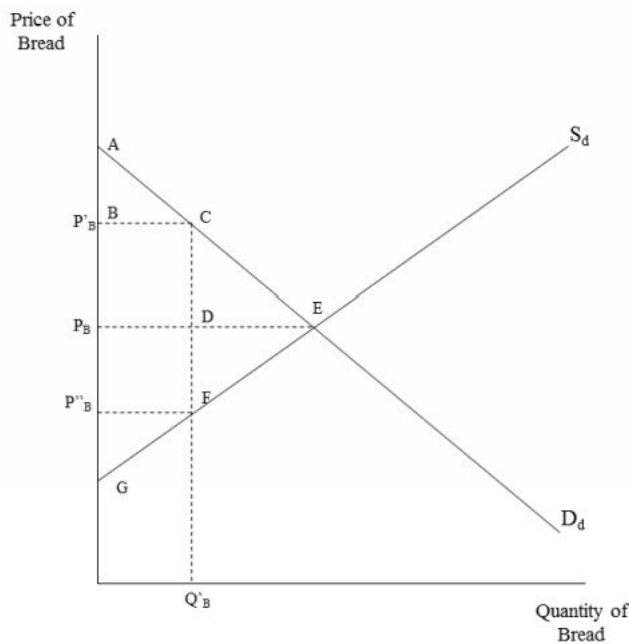
*In a similar manner, producer surplus measures the welfare gain that producers obtain from selling goods at prices that are above their production cost. Given a typical (upward-sloping) marginal cost curve, the producer is often able to produce a product for less than the market price. This net gain that producers*

*accrue is called a surplus. The area above the marginal cost curve and below the market price is called producer surplus.*

If price is above the intersection of supply and demand (as in Figure 2.8 at  $P_B'$ ), then producer surplus is area  $BCFG$ , which could be higher or lower than at the intersection of supply and demand, but consumer surplus is much lower (area  $ABC$ ) and the sum of producer and consumer surplus is less than when domestic supply equals domestic demand. In this case, bread's price does not reflect the true opportunity costs of bread and there is a net loss to society (the triangular area  $CEF$  in Figure 2.8). The signals are not optimal because consumers are receiving price signals that bread is worth  $P_B'$ , when it only costs  $P_B''$  to produce. At a price of  $P_B'$ , consumers will choose to consume only  $Q_B'$  units of bread, less than what they would consume if they were given the correct price signal ( $P_B$ ). A similar story could be told if bread's price was below the intersection of supply and demand, such as at  $P_B''$ , but in this case consumer surplus would be larger than optimal, producer surplus would be smaller, and there would be another net loss to society.

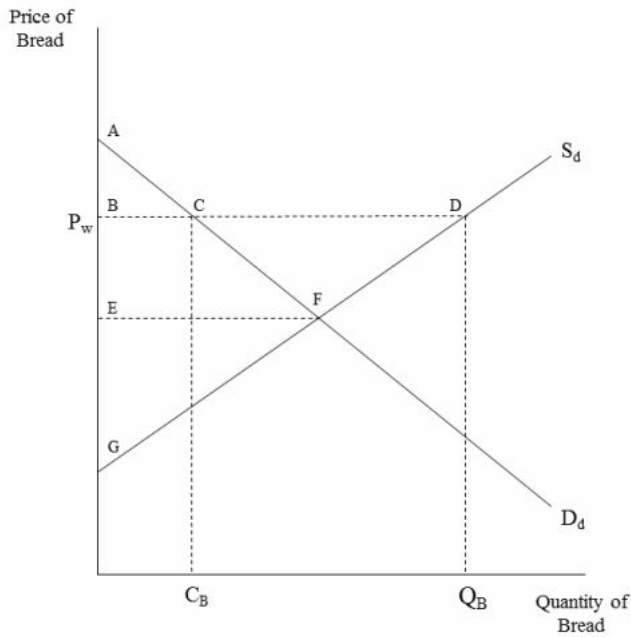
When trade is allowed, though, the constraint that domestic supply equals domestic demand is relaxed. The country can produce a surplus or consume more than it produces as long as international trade makes up the difference. Note, however, that if a country imports one product, it must export at least one product to preserve its trade balance. Figure 2.9 shows an example where a small country becomes an exporter of bread, since it produces a surplus at the world price that it faces.

Figure 2.8 Consequences of Non-Equilibrium Prices on Welfare



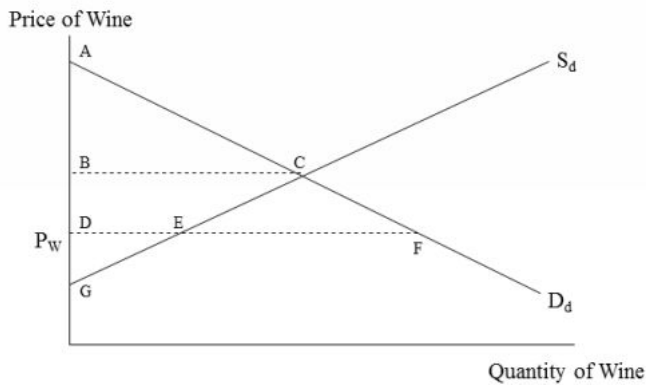
If the world price of bread ( $P_W$ ) is above the autarkic price, then the country will export. Domestic production will be  $Q_B$ , domestic consumption will be  $C_B$ , and the difference will be exported. Producer surplus in Figure 2.9 is  $BDG$ , consumer surplus is  $ABC$ , and the net gain to the country from trade is the triangular area  $CDF$ . Notice that relative to no-trade, consumers clearly lose (area  $BCFE$ ), while producers clearly gain ( $BDFE$ ).

Figure 2.9 Gains From Trade for the Exporting Country



If trade is opened up bread producers who gain could compensate consumers fully for their loss from the higher price of bread and there would still be net gains to bread producers. This doesn't normally happen because there are many goods that are traded and the country will import some of those goods, making consumers net gainers in total. Figure 2.10 shows that consumers clearly gain when trade is opened and the good is imported. If the U.S. allowed wine imports at the world price ( $P_w$ ), consumers would gain  $BCFD$  from the lower price of wine, but wine producers would lose  $BCED$ . In total, though, the country would have a net gain of  $CEF$  due to trade in wine.

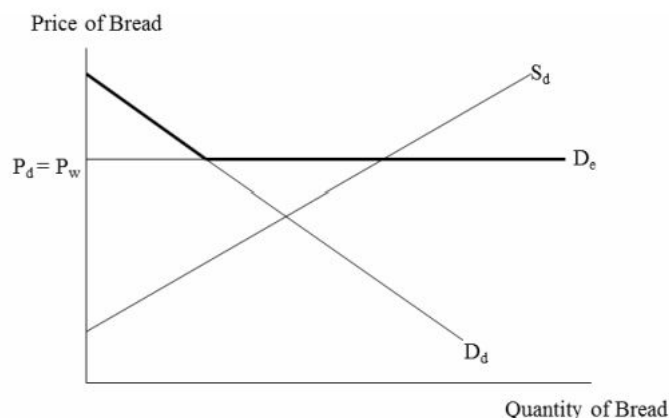
Figure 2.10 Gains From Trade for the Importing Country



Figures 2.9 and 2.10 allow the gains from trade shown in Figures 2.5 and 2.6 to be seen on a single-good basis. The gains are still conceptual, especially the gains to consumers, but they are more measurable than the pure utility concepts used in Figure 2.5. However, these gains are predicated on the idea that resources are mobile between industries, so that resources (workers, land, plants, etc.) from industries that

shrink will be re-employed in industries that expand from trade.

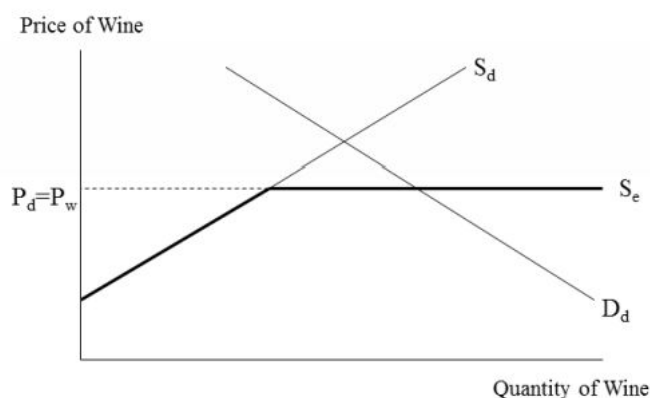
Figure 2.11 Effective Demand Curve for a Bread Exporting Country



A critically important concept throughout the rest of this book is effective supply and demand. Effective supply and demand measure the impact of domestic and world markets on the country. Figure 2.11 shows that the effective demand curve for a small bread-exporting country is perfectly elastic at the world price,  $P_w$ , meaning that the country can export any amount that it wants at the world price. The effective demand curve,  $D_e$ , is the sum of the domestic demand curve (with its normal down-ward slope) and the international demand curve, which is perfectly elastic at the world price. The domestic price,  $P_d$ , assuming there are no trade barriers, is determined by the intersection of the supply curve and the effective demand curve [7].

Figure 2.12 shows the effective supply curve ( $S_e$ ) for a small wine-importing country, which is the sum of the upward sloping domestic supply curve and the international supply curve, which is perfectly elastic at the world price ( $P_w$ ). The domestic price,  $P_d$ , is determined by the intersection of the effective supply curve,  $S_e$ , and the demand curve.

Figure 2.12 Effective Supply Curve for a Wine Importing Country



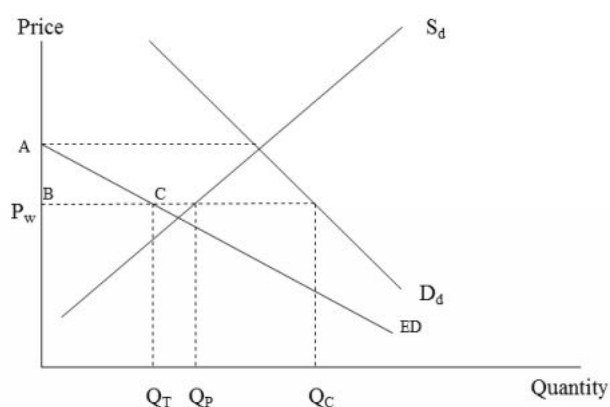
If the domestic supply or demand curve shifts with a small exporting (importing) country, one can see that there will be no change in the domestic price as long as the country continues to export (import). Shifting the supply or demand curve will only change the amount that is exported (imported). If there is an inward shift in the demand curve for an exporter, the amount of exports will fall by the amount of the shift. If there is an outward shift in the supply curve for an importer, the amount of imports will fall by the amount of the shift. The interested reader can plot all of the combinations of supply and demand shifts to verify that only the quantity traded will change (unless the exporter changes to an importer or vice versa).

One last important topic is the explanation of the amount that a country will import or export at a given price. These curves are called *excess demand* and *excess supply curves*, and are derived directly from the domestic supply and demand curves. Excess demand is obtained by taking the difference between what

domestic consumers purchase and what domestic producers supply at a given price. Thus, excess demand,  $ED$ , is the horizontal subtraction of the domestic supply curve from the domestic demand curve. This is shown in Figure 2.13.

At the autarkic price, excess demand for the good is zero, since the quantity of domestic supply is exactly equal to the quantity of domestic demand. At lower prices, though, excess demand is positive because domestic consumers consume more than domestic producers supply. This gap is made up by imports (for example, the length of  $BC$  in Figure 2.13 is exactly  $Q_C - Q_P$ ). Thus, the excess demand curve slopes downward from the autarkic price with a slope that is flatter (more elastic) than the domestic demand curve. The excess demand curve is more elastic because it captures two effects as domestic price falls: 1) more is consumed and 2) less is produced. Explanation Box 2.4 shows the relationship between domestic supply and demand elasticities and excess supply and demand elasticities.

Figure 2.13 Graphical Derivation of the Excess Demand Curve



Similarly, Figure 2.14 shows the derivation of an excess supply curve. Again, at the autarkic price, excess supply is zero because the quantity of domestic supply equals the quantity of domestic demand. At higher prices, excess supply,  $ES$ , is positive because domestic producers supply more than domestic consumers consume. This gap is made up by exports (for example, the length of  $AB$  in Figure 2.14 is exactly  $Q_P - Q_C$ ). The excess supply curve will have a similar shape to the domestic supply curve, except it is flatter (more elastic). This is due to the two effects captured by excess supply as domestic price increases: 1) more is produced and 2) less is consumed.

*Explanation Box 2.4. Derivation of the Excess Demand Curve*

*By definition the excess demand,  $M$ , is the difference between domestic demand,  $D$ , and supply,  $S$ .*

$$M = D - S$$

*taking the derivative of each side with respect to price,  $P$ ,*

$$\frac{dM}{dP} = \frac{dD}{dP} - \frac{dS}{dP}$$

$$\frac{P}{Q} \frac{dM}{dP} = \frac{dD}{dP} \frac{P}{Q} - \frac{dS}{dP} \frac{P}{Q}$$

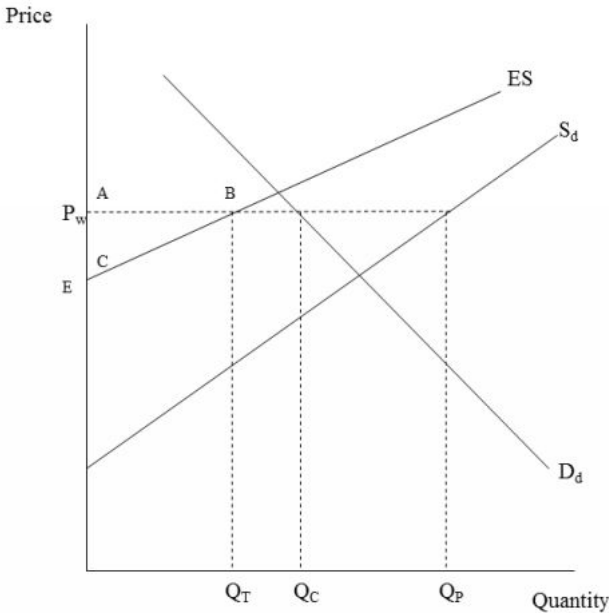
$$\epsilon_m = \epsilon_d - \epsilon_s$$

*Where  $\epsilon_m$ ,  $\epsilon_d$  and  $\epsilon_s$  are the excess demand, demand, and supply elasticities, respectively. Since  $\epsilon_d$  is negative and  $\epsilon_s$  is positive,  $\epsilon_m$  will be a larger negative number than  $\epsilon_d$ . Import demand*

*functions are always more elastic than ordinary demand functions. In a similar way, export supply functions are always more elastic than ordinary supply functions.*

The excess supply and demand curves can be used to show the gains from trade. If the world price in Figure 2.13 is  $P_W$ , the country in question will import  $Q_T$  from the rest of the world because there is an excess demand. The importing country's gain from trade can be measured as area  $ABC$ , which is exactly equal (by construction) to the gains from trade using the domestic supply and demand curves. Similarly, if the world price in Figure 2.14 is  $P_W$ , the country in question will export  $Q_T$  to the rest of the world because there is an excess supply. The exporting country's gain from trade is again measured by the area  $ABC$ , which is exactly equal to the gains from trade using the domestic supply and demand curves.

Figure 2.14 Graphical Derivation of an Excess Supply Curve





## Introducing the World Market and Large Countries

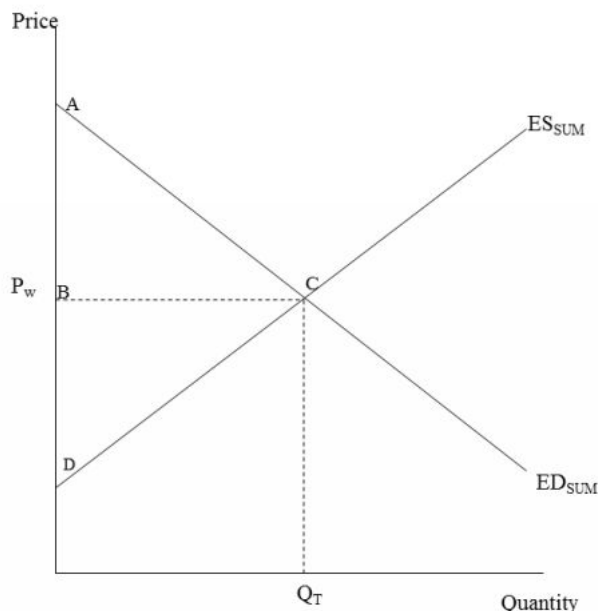
The single good, small country analysis assumes that there is a well-functioning world market that determines world price, and the small country uses that world price to determine how much it should produce and consume. If there is perfect competition throughout the world and no externalities, trade barriers, or transportation costs, this world price will be the true value of the good in question. The price will reflect the costs of producing the good and the value the good has in consumption. Under these assumptions, world market equilibrium occurs where the horizontal sum of all domestic supply curves intersects the horizontal sum of all domestic demand curves. It's logical that world price would be where world supply (or marginal costs) equals world demand (or marginal value).

### *Explanation Box 2.5 The Law of One Price.*

*With perfect competition, no externalities, no trade barriers, and no transportation costs, the Law of One Price prevails. Because of arbitrage opportunities, traders will ensure that the good's price will be identical among all countries. If any price difference prevails, pure economic profit could be obtained by purchasing the good in one country (with the low price) and shipping it to another country (with the high price). This profit is because all transportation and transaction costs are zero. If transportation and transactions costs are positive, then the Law of One Price will only prevail if trade takes place, and there will be price differences that reflect those costs.*

Another way of looking at world market equilibrium is by using the excess supply and demand curves. Use of the excess curves will make it easier to envision the effects of relaxing assumptions concerning trade barriers and transportation costs. In this case, world market equilibrium occurs where the sum of the excess supply curves for exporters intersects the sum of the excess demand curves for importers. This equilibrium is shown in Figure 2.15, along with the surpluses (gains) that world trade generates. Total world welfare is maximized at a price of  $P_W$  and a quantity traded of  $Q_T$ . World importing countries gain the area  $ABC$ , while world exporting countries gain the area  $BCD$ .

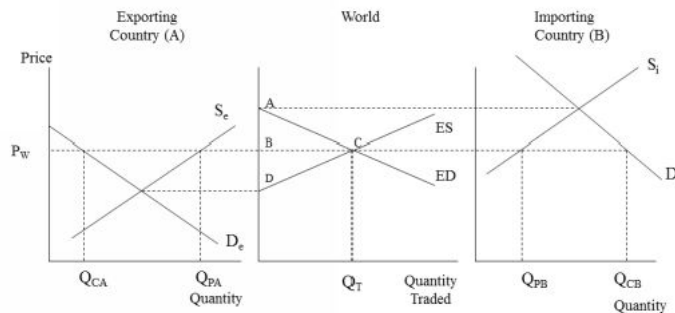
Figure 2.15 World Equilibrium Using Excess Supply and Demand Curves



A convenient simplification of the world market involves a situation where there is a two-country world (an exporting country and an importing country) and one good [8]. This situation is depicted in a three-panel diagram, as shown in Figure 2.16. The left panel depicts the domestic supply and demand situation in the exporting country; the right panel depicts the domestic supply and demand situation in the importing country; and the middle panel depicts the (excess) supply and (excess) demand situation in the world market.

The excess supply function in the middle panel is derived from the left panel and the excess demand function in the middle panel is derived from the right panel.

Figure 2.16 Trade Equilibrium in the Exporting Country, Importing Country, and World

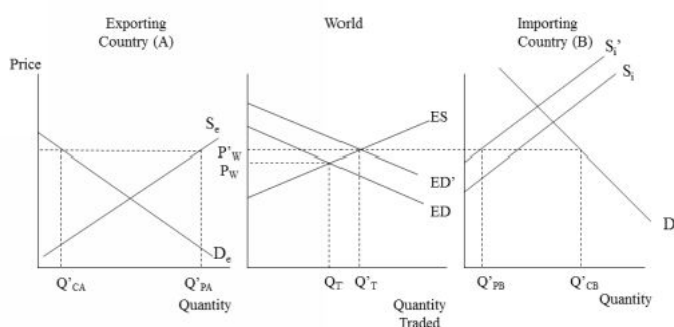


World market equilibrium is shown at  $P_W$  associated with exports and imports of  $Q_T$ . With no trade barriers and transportation costs,  $P_W$  will prevail in both countries and the excess supply in country  $A$  ( $Q_{PA} - Q_{CA}$ ) will exactly equal excess demand in country  $B$  ( $Q_{CB} - Q_{PB}$ ). World prices are equal to world opportunity costs, and world welfare is maximized by area  $ACD$  in the middle panel (area  $ABC$  going to importers and area  $BCD$  going to exporters). There are no price differences between countries because transportation and transaction costs are zero, so arbitrage will ensure that there is no difference in price between countries.

It is very useful to investigate what happens to equilibrium when there is a shift in supply or demand curves. This is called *comparative static analysis*, which is easily performed using the three-panel framework. If the good in question is bread and there is a drought in the importing country (reducing wheat production), the supply curve in the right panel shifts to the left, to  $S_i'$ , as depicted in Figure 2.17. The excess demand curve in the middle panel shifts upward to  $ED'$ , which forces world price to increase (to  $P_W'$ ) and the quantity traded to increase (to  $Q_T'$ ).

The effects on the two countries are traced back by using the new world price. Quantity supplied and demanded in the exporting country would move to  $Q_{PA}'$  and  $Q_{CA}'$ , respectively; and quantity supplied and demanded in the importing country would move to  $Q_{PB}'$  and  $Q_{CB}'$ , respectively. By construction  $Q_{PA}' - Q_{CA}' = Q_{CB}' - Q_{PB}'$ .

Figure 2.17 Effects of a Drought in the Importing Country



Only one curve shifts in this comparative static analysis. This is typical of comparative static analysis and it highlights the important distinction between shifting curves and moving along curves. In the above example, the drought only shifted the supply curve in the importing country, but it caused a movement along the other curves. One must be careful in comparative statics to only shift the appropriate curve, otherwise the analysis will become confused and the results erroneous. Table 2.2 summarizes the effects of increased supply and demand by each country on world price and quantity traded. Decreases (shifts) in supply and demand will have the opposite effect on world price and quantity traded. Interested readers can verify these impacts using a three-panel analysis.

**Table 2.2 Effects of Increased Supply and Demand on World Price and Quantity Traded.**

<i>Shift</i>	<i>Effect on <math>P_W</math></i>	<i>Effect on <math>Q_T</math></i>
Increase in importing country supply	$P_W$ down	$Q_T$ down
Decrease in importing country supply		$P_W$ up $Q_T$ up
Increase in exporting country supply	$P_W$ down	$Q_T$ up
Decrease in exporting country supply		$P_W$ up $Q_T$ down
Increase in importing country demand		country demand up $P_W$ up $Q_T$
Decrease in importing country demand	$P_W$ down	$Q_T$ down
Increase in exporting country demand		country demand down $P_W$ up $Q_T$
Decrease in exporting country demand	$P_W$ down	$Q_T$ up



## Introducing Transport Costs

When the assumption of zero transport costs is relaxed, there is no such thing as the world price, which is true in the real world -- for instance there is no such thing as the world price of wheat. Instead, there are as many prices as there are locations in the world, reflecting transport costs from producing regions to consuming regions. In the simple two-country, one good world being analyzed there are two prices -- the exporter's price and the importer's price -- and a constant per unit transport cost from the exporting country to the importing country.

Because it is assumed that there are no other transactions costs (including trade barriers), arbitrage will guarantee that the price difference between the importing country,  $P_I$ , and the exporting country,  $P_E$ , will be no greater than transport costs,  $t$ :

$$P_I - P_E \leq t \quad (2.5)$$

Otherwise, traders would make a positive profit by buying wheat in the exporting country and selling wheat in the importing country.

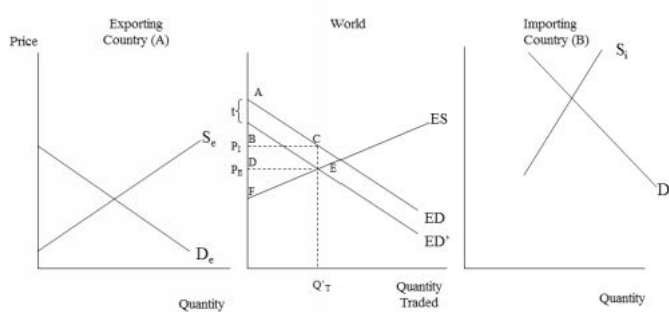
If the price difference between  $P_I$  and  $P_E$  is less than transport costs, then traders will not export wheat because their export revenue cannot cover transport costs. Therefore if trade takes place, the importing country price must equal the exporting country price plus transport costs:

$$P_I = P_E + t \quad (2.6)$$

The addition of transport costs can be incorporated into the three-panel analysis a number of ways. It may be easiest to view transport costs as an added cost of exporting, which can be depicted as a downward shift of the excess demand curve in the middle panel (to  $ED'$ ). This is shown in Figure 2.18 with the corresponding price in the exporting country,  $P_E$ , price in the importing country,  $P_I$ , new world trade,  $Q_T'$ , and transport cost,  $t$ . In this case the gains from trade are reduced to the small triangles  $ABC$  (for the importing country) and  $DEF$  (for the exporting country). The area  $BCED$  is the transport costs for the good, which reflect the fact that world trade consumes transportation resources and therefore prices should reflect this.

Note that the exporting country has a lower internal price because of transport costs, while the importing country has a higher internal price because of transport costs. The incidence of the transport costs will depend on the shape of the excess demand and supply curves. If the excess demand curve is more elastic than the excess supply curve, the importing country price will increase less than the exporting country price will fall. The opposite is true if the excess supply curve is more elastic.

Figure 2.18 Introducing Transport Costs in a Three-Panel Diagram



The solution to international trade problems when some countries are large and the supply and demand curves are linear is a spatial equilibrium model. The spatial equilibrium model maximizes the sum of the gains from trade for all importers and exporters, subject to constraints (such as equation 2.5) that are inequalities. The model is quite flexible and can handle many countries and many hindrances to trade (e.g., transportation costs, tariffs and quotas). Its solution is price, consumption, production, and trade for each country, along with the bilateral commodity flows. The objective function is a quadratic function of price because the gains from trade are triangles that involve price and quantities (which are linear functions of price). A spatial equilibrium model is a powerful tool to investigate comparative static effects on trade among countries.

## Summary

1. World relative prices give the signals concerning what countries should produce and consume. In the Ricardian case, countries will specialize in the good where the country has a comparative advantage relative to other goods.
2. Countries gain from trade because they are able to concentrate on producing goods where they are relatively efficient and trade for goods where they are not efficient producers.
3. With concave production possibilities curves there will normally be incomplete specialization by countries – they will produce some quantity of each good. Gains from trade are measured through increased consumption that trade allows in one of the goods.
4. If a country exports a good, it is because the world price is above the country's autarkic price. Through exports, the country gains overall because its producers gain more surplus than consumers lose. If a country imports a good, it is because the world price is below the country's autarkic price. Through imports, the country gains overall because its consumers gain more surplus than producers lose.
5. Excess supply and demand curves are excellent ways to depict trade situations if countries are large. Comparative static analysis allows world price changes, trade flow changes, gains from trade to be shown.
6. Relaxing the assumption of zero transportation costs results in less trade. Further, there are at least two prices which prevail in the world: price in the importing country (which is higher) and price in the exporting country (which is lower).

## Questions

1. How would you extend the analysis of gains from trade to more than two countries? To more than two goods?
2. What evidence can you find that gains from trade exist?
3. Why are agricultural economists more interested in export and import volumes, rather than returns to production factors?
4. What wheat-exporting countries would you consider “large?” What wheat-importing countries would you consider “large?”

## **Chapter 3 Trade Policies of Importing Countries**

Despite clear gains from free trade, the world is characterized by trade barriers that make prices in importing countries higher than world prices. These trade barriers increase the price of imported goods and therefore change relative prices in the economy. As relative prices shift, production and consumption adjusts and welfare of various groups changes. The implication is that governments know more about appropriate price signals than world markets.

This chapter covers the production, consumption, and welfare changes from various policies imposed by importing countries. The effects of trade policies on consumer and producer surplus are highlighted because they show the losses that come from these barriers. It is important to understand the trade-offs that occur when a country decides to pursue its own pricing policies, rather than to rely on world prices for its signal to producers and consumers. Throughout the chapter, it is assumed that welfare is equally valued among producers, consumers, and the government; meaning that the policy-makers value an additional unit of welfare in the hands of these three groups equally. One can conclude, though, from the host of trade barriers confronting agricultural products in most countries, that this assumption is not valid.



## Major Types of Import Barriers

Import barriers can come in many forms and countries have been increasingly creative in establishing new barriers over time. The earliest and most visible trade barrier is the simple import tariff (or tax). The *import tariff* can be a fixed amount per unit (a specific tariff) or can be a fixed percentage of the imported good's price (an ad valorem tariff). Generally, exporters can supply any amount to the importing country, but all imports are subject to the duty when they cross the border into the country. This import tax is considered a cost of supplying goods to the importing country.

Another common import barrier is the *import quota*, which restricts the quantity of a product that can enter the country. Sometimes these quotas are fixed on a country basis (e.g., the Philippines can ship only  $X$  tons of sugar to the U.S.). A firm must have an import license or visa before it is allowed to ship the product into the importing country. As will be seen later in this chapter, if the domestic price in the importing country is higher than the world price, then the import license has a value. Import licenses can be auctioned to the highest bidder, sold for a fixed price, given to importing firms, or distributed through government agencies. The way these licenses are distributed can be very important in determining welfare effects.

The *tariff-rate quota* is a combination of the import quota and import tariff. In this policy, a fixed quantity or value of imports is allowed at a preferential tariff (sometimes zero) and all imports over that quota are subject to a higher duty. Often the higher duty is prohibitive such that imports above the quota are zero. This policy gives exporting countries access to the importing country's market, but the domestic price in the importing country can still be above the world price plus the preferential tariff. This policy is often used as a means to liberalize trade when the quota is expanded and the over-quota tariff is reduced over time.

Some governments choose to follow policies that keep some agricultural prices fixed in their country. There are two basic import policies that can allow this domestic policy to prevail – the government can control importing through *state trading* (so they import at the world price and sell at the fixed domestic price) or a *variable levy* system can prevail (where the import tariff is the difference between the fixed domestic price and the world price).

These are the major import policies that are used in the world today and they are analyzed in this chapter. Technical barriers to trade are covered in another chapter because they are not easily analyzed in economic terms. Furthermore, technical requirements on international trade often provide economic benefits, as will be seen later.

## Reasons for Trade Barriers

There are many reasons that a government might want to impose barriers on imports, but in most instances, these policies reduce the overall welfare of consumers and producers. In general, the government may want to redistribute welfare among the three major groups – producers, consumers, and the government. This basically means that the government values welfare (or surplus) to one group more than welfare to another group. Governments often rely on import tariffs and other income from trade barriers to provide a substantial portion of the *government budget*. Collecting a duty on imported goods is an easier way to provide revenue than establishing and policing an income tax, and it is less visible than collecting a sales tax at retail outlets. Import barriers might be the most efficient way to collect much needed government revenue, especially in less developed countries.

Some countries feel that certain products must be protected from international competition for national security reasons, and food is sometimes mentioned as important for national security. Governments often feel that *self-sufficiency* is important and that domestic producers should not be driven out of business by foreign competition. A similar argument for trade barriers is to *protect newly-established businesses* during a critical phase in their development (the infant-industry argument). It can be shown, though, that in both of these cases, it is more efficient for the government to subsidize producers through direct payments, rather than to distort prices through trade barriers.

### *Explanation Box 3.1 Tariffs versus Subsidies*

*When perfect competition prevails it is always best that prices reflect production costs and consumer value. If tariffs are enacted, producer and consumer prices are distorted and losses occur. If a subsidy scheme can be designed such that only producer prices are distorted, losses are lower. Furthermore, with the subsidy, policy-makers may be able to meet their objectives (more producer income) with less welfare loss.*

Another important reason for import barriers is that businesses and farmers feel that they must be *protected from import competition*, and the government acquiesces because of their political power. In essence, the government gets more benefit from an additional unit of welfare to producers than to consumers. Lobbying groups and the theory of collective action help explain this result. It is in the interest of producers and farmers to lobby hard for import protection because of the tremendous difference it can make in their income. In contrast, consumers are a much more diverse group that is not well organized. Consumers have some interest in freer trade, but most trade policies impact them less, per person, than producers.

The only legitimate economic reason for import barriers is if the *importing country is large* enough that it can use its market power to extract welfare from the rest of the world. In this case, the importing country is so large that if it restricts its imports, the world price will fall. This fall in world price can benefit the large importing country and increase its welfare. The importing country is extracting welfare from exporting countries by changing its importing pattern.

## **Effects of Specific Import Policies**

The analysis of each import policy will start from the free trade case and measure the losses due from various trade barriers. The welfare analysis will weight consumers, producers, and the government equally<sup>[9]</sup>. Unless otherwise noted, the small country case, zero transport (and other transaction) cost and perfect competition are assumed. Free trade is used as the baseline because free trade is generally the policy that maximizes the country's welfare. In each case the effective supply and demand curves are important to the analysis. The effective supply curve includes international and domestic suppliers and the effective demand curve includes international and domestic demanders.

## Import Tariff

The simplest and clearest import barrier is a tariff or tax on imports. The tariff can be a constant amount per unit of the product (specific tariff) or a constant percentage of the product's value (ad valorem tariff). Either way, under perfect competition there will be a wedge between the exporter's price and the importer's price, even when transport costs are zero. The effects, however, are very similar to the impact of positive transport costs covered in Chapter 2. The distinction is that there are no resources that are consumed (transportation) to justify the difference between the import price and the export price. With an import tariff, the wedge is artificial.

If the country is small, the normal supply-demand picture will tell the entire story, since the country does not markedly influence world supply or demand. Under free trade, the country faces a perfectly elastic supply curve from the rest of the world (at  $P_W$  in Figure 3.1). When this function is added to the domestic supply curve, the effective supply curve,  $S_e$ , is the darkened line that includes the domestic supply curve below  $P_W$  and is horizontal at  $P_W$ . In equilibrium (assuming that the autarkic price is above  $P_W$ ), the country produces at  $Q_p$ , consumes at  $Q_c$ , and imports  $Q_c - Q_p$ . The importing country price is  $P_d$ , which is identical to the world price.

If the country imposes a specific tariff of  $t$  per unit, the domestic price will move up to  $P_W + t$  as long as the autarkic price is above  $P_W + t$ . Under perfect competition, importers are not making positive economic profits, so they must pass on the tariff fully to the importing country. This new internal price changes production and consumption patterns in the importing country, as shown in Figure 3.2, but it does not change the world price because the importing country is small (the added production and lower consumption have no significant influence on world markets). The effective supply curve is now the domestic supply curve below  $P_W + t$  and it is horizontal at  $P_W + t$ . Producers react to the new price and increase production to  $Q_p'$ , consumers react by decreasing consumption to  $Q_c'$ , and imports fall to  $Q_c' - Q_p'$ .

Figure 3.1 The Importing Country With Free Trade

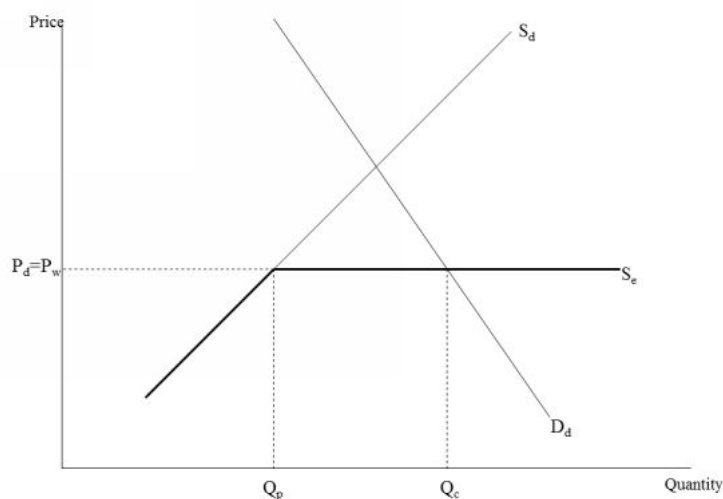
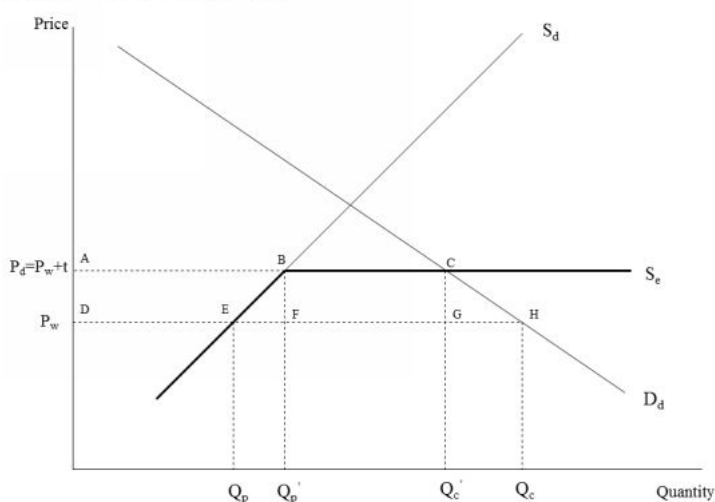


Figure 3.2 can be used to see the gains to producers, consumers and the government. Producers benefit from the tariff because they receive a higher price for their output, and this higher price also encourages them to produce more. Producer surplus increases by the area  $ABED$ . The government receives  $t$  for every unit imported, so the government has revenue of  $BCGF$ . Since this revenue can be used to fund government services, it is also a benefit to the economy. Consumers are the losers because they suffer an increase in price for the good, which also encourages them to consume less. The loss in consumer surplus is  $ACHD$ , an area that exceeds the other two areas (producer and government gains) combined. So there is a transfer from

consumers to the producers and government, but there is a net loss too.

Figure 3.2 Effects of an Import Tariff



The country's welfare falls by the two triangles  $BFE$  and  $CHG$ . The first triangle,  $BFE$ , is often called the *production loss* because it measures inefficiencies caused by increased production by domestic producers. The tariff has encouraged production of the good by domestic producers whose marginal cost is above more efficient international producers. World marginal cost is at  $P_w$ , but each unit produced beyond  $Q_p$  in the importing country has a marginal cost above  $P_w$ . When these extra costs are summed over the increased production, the triangle  $BFE$  is obtained.

The second triangle,  $CHG$ , is often called the *consumption loss* because it measures inefficiencies caused by reduced consumption. The tariff sends the wrong signals to consumers because the new price does not reflect the world's opportunity cost for the good. Consumers are being sent a false signal that the good is scarce, and this signal causes them to reduce consumption. Consumers are losing surplus because they would have consumed more than  $Q_c'$  and received added welfare if the price signals were accurately reflecting world opportunity costs. When this added value is summed over consumers, the triangle  $CHG$  is obtained.

As stated earlier, many countries are considering moving from restricted trade to freer trade. When eliminating a tariff, a scheme could be invented that would pay domestic producers for their losses from freer trade and there would be enough gain on the part of producers that the welfare of the economy would still improve. Hayami proposed a scheme for liberalizing Japan's beef import system in 1979. It would provide a deficiency payment for beef producers, while allowing consumers access to imported beef at a much lower tariff. Japan did finally liberalize its beef imports in 1986 (a very controversial move on the government's part), but there was no deficiency payment offered (Coyle). Nonetheless, Hayami's analysis showed that there were huge benefits available for Japanese consumers if the objections of the small number of beef producers could be overcome.

### Explanation Box 3.2 Japanese Beef Trade Liberalization

*The Japanese beef market was controlled by the Livestock Industry Promotion Corporation (LIPC), a quasi-government organization, until July 1991, when private traders were allowed to handle all imported beef directly. The termination of LIPC as a state trading entity was part of the Japanese Beef Access Agreement of 1988. Prior to 1988, the LIPC dictated the quality and origin of most Japanese beef imports, and licensed traders would then import the specific beef cuts that LIPC requested. Only a small portion of the trade was allocated to specific traders, who could make exact orders on what beef they wanted.*

*The LIPC had specific quotas that it had negotiated with Australia and the U.S. (the two leading beef exporters to Japan), but the final allocation between these two countries was determined by administrative decisions, not the market. This was frustrating to beef traders because the Japanese beef market is far and away the most differentiated market in the world. One can go to a Japanese steakhouse and order four to six different qualities (with four to six widely different prices) of the same beef steak.*

*The Japanese wagyu beef is the highest quality and most expensive. U.S. beef is typically within the middle part of the quality spectrum (slightly below beef from fattened Japanese dairy steers), while Australian and New Zealand beef (which is grass-fed) is normally viewed as the lowest quality (MATRIC). In 1977, the Australians controlled 85% of the Japanese beef import market (the U.S. had 9%), but by 1985, the Australians were down to a 62% share versus the U.S.'s 30% share (Hahn et al.). Some economists felt that the Japanese were allowing the U.S. share to increase for political reasons (Alston et al.).*

*Before liberalization, all Japanese beef imports were subject to a 25% tariff, but the price of Australian beef on Japanese wholesale markets was normally much above the level implied by a 25% tariff. These implied tariffs on imports were needed because the LIPC was supposed to keep domestic beef prices in Japan within a specific range. Some of these implied tariffs or "rents" were captured by LIPC's resale price (the government sold imported beef for much more than its purchase price), but the rest accrued to Japanese butchers who simply made a high margin on any Australian beef they were allowed to buy through LIPC (Hayami). Profits for LIPC were used to help domestic beef producers through subsidized credit, deficiency payments for calves, and other programs.*

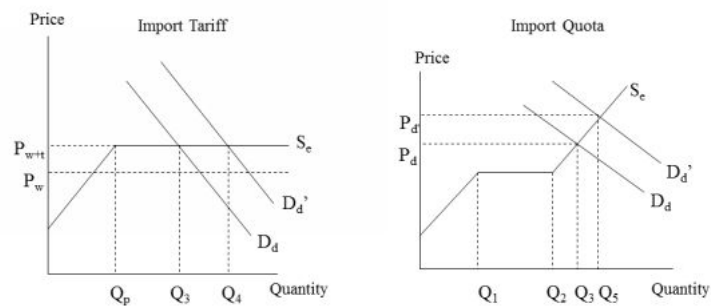
*In July 1991, the LIPC became simply a research and reporting agency of the Japanese government, turning over importing to private traders. Beef imports into Japan then became subject to a 70% tariff for the period July 1991 through June 1992, a 60% tariff for the period July 1992 through June 1993, and a 50% tariff after June 1993. During the Uruguay Round GATT negotiations, the Japanese pledged to lower their beef tariff to 38.5%.*

*Eliminating the LIPC, and the concomitant reductions in tariffs, had a tremendously positive impact on U.S. beef exports to Japan. In 1987, U.S. beef exports totaled \$562 million -- or 397 million lbs. on a carcass weight basis (Hahn et al.). In 1997, U.S. beef exports reached a peak of \$2.31 billion (or over 1 billion pounds on a carcass weight basis), but they have fallen since that time due to various factors (including slow income growth in Japan and BSE discoveries in the U.S.). Nonetheless, it is amazing what private traders can do to increase markets and sales if they are allowed.*



import tariff case is shown in the left panel and the import quota case is shown in the right panel. Both panels have initial consumption at  $Q_3$ , and initial domestic production is identical ( $Q_p = Q_1 + Q_3 - Q_2$ ). If the domestic demand curve ( $D_d$ ) shifts outward in the import tariff case to  $D_d'$ , imports rises by the amount that the demand curve shifts. In the import quota case (assuming that the quota is binding), shifting the domestic demand curve to  $D_d'$  increases the domestic price to where the effective supply curve intersects the demand curve; imports will not change. The only way that domestic consumers can obtain more output is to encourage domestic producers (by a higher price); importers are not allowed to provide more output because

Figures 3.4 Differential Effects of a Demand Shift with Import Tariffs and Quotas



of the import quota.

If the domestic demand curve shifts to the left in the import quota case, it is possible that the market will be in the region where  $P_w$  prevails but there are still imports (between  $Q_1$  and  $Q_2$ ). In this case, the import quota is not binding and import licenses have no value because the domestic price is identical to the world price. So there is a region of consumption levels that would generate import levels that would be consistent with free trade, even though there is an import quota policy. This possibility does not exist with the import tariff case -- all imports face a tariff.

Shifts in the domestic supply function will only affect the lower part of the effective supply curve under an import tariff, but a domestic supply shift will affect the entire effective supply curve under the import quota case. Under an import tariff case, as long as there are imports, shifting the domestic supply curve will change only the quantity of imports. Domestic supply shifts in the import quota case may change import levels (if the quota becomes non-binding), but will definitely change domestic price.

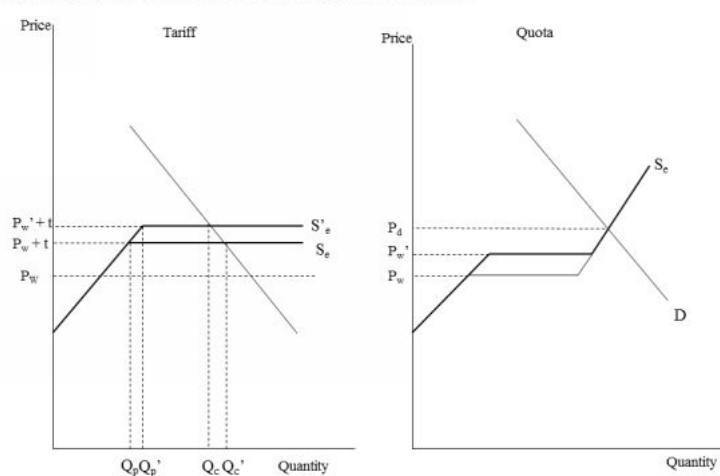


## World Price Stability under Tariffs and Quotas

Import tariffs and quotas also have different effects on world price stability. When the world price changes, it is a signal that the relative scarcity of the product in question has changed. If the world price increases, the product has become scarcer and that sends signals for producers to produce more and consumers to consume less. Figure 3.5 shows that under an import tariff, the importing country allows those world price signals to be transmitted (through a higher internal price) to their domestic producers and consumer. Because the price is allowed to change in the importing country, production and consumption will adjust.

Figure 3.5 shows that under an import quota, those signals are not allowed to be transmitted to domestic producers and consumers, as long as the quota is binding. If the world price is lower than the domestic price in the importing country, the importing country will not change its production and consumption decisions because the domestic price doesn't change. The importing country has shielded itself from outside disturbances. Remember, however, that the domestic price in the importing country changes if the domestic supply and demand conditions change. If the domestic situation is more volatile than the world situation, the importing country will experience more domestic price fluctuations under an import quota than under an import tariff.

Figure 3.5 Effects of a World Price Change, Tariff vs. Quota

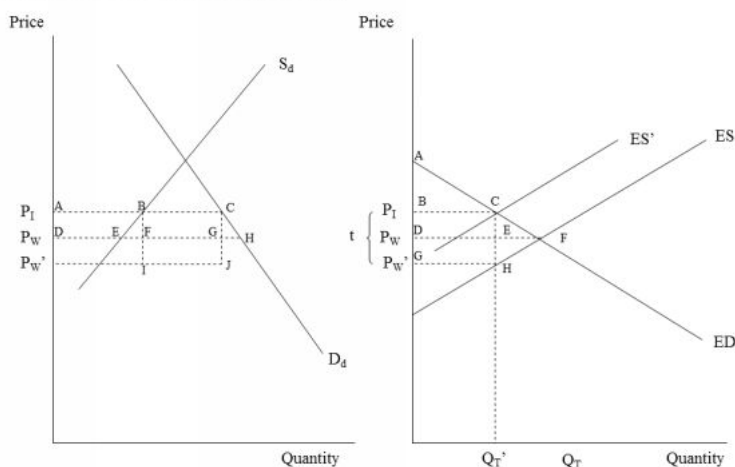


## The Large Country Case and Optimal Tariff

If the small country assumption is relaxed, the importing country's policies can affect the world price. Any policy that reduces the country's importation will reduce world price, and an import tariff by a large country certainly falls into this category. If the importing country is large, one must use at least two panels from the three-panel diagram to see the full impact of an import tariff.

Figure 3.6 shows that when the importing country institutes a specific tariff of  $t$  per unit, the difference between the world price and the import price is  $t$  units. The world price falls from  $P_W$  to  $P_W'$  and the price in the importing country increases to  $P_I$ . Notice that the importing country's price increases by less than the amount of the tariff. In essence, the importing country forces the rest of the world to pay part of the tariff through a lower world price. The quantity imported falls to  $Q_T'$ . The result comes from the importing country encouraging its domestic producers to increase production and its domestic consumers to decrease consumption (through increasing its domestic price due to the import tariff). This causes the exporter price to fall because world demand has fallen.

Figure 3.6 Import Tariff for a Large Country



The importing country's welfare changes associated with the large country case are quite interesting because the rest of the world pays part of the tariff. Surplus measures for the importing country are measured in the left panel. The tariff causes producer surplus to increase by area  $ABED$  in the left panel; consumer surplus to decrease by area  $ACHD$ ; and government revenue of area  $BCJI$ . The production and consumption losses, areas  $BFE$  and  $CHG$ , respectively, are smaller than under the small country case because the new world price is lower. It is unclear whether the large country is worse off from the tariff. One must compare the sum of areas  $BFE$  and  $CHG$ , the losses, with the area  $FGJI$ , the area gained because world price fell. If the latter is greater than the former, then the large country has gained from imposing the import tariff.

The right panel shows gains/losses for the importing and exporting countries; the import tariff shifts the  $ES$  curve up by the amount of the tariff. The panel clearly indicates that the exporting country has lost because of the import tariff. Specifically, the exporting country has lost area  $DFHG$ . The consumers and producers in the importing country gain area  $ABC$  from trade, but their government obtains revenue from the import tariff of area  $BCGH$ , making the importing country's total gain area  $ACHG$ , representing, relative to free trade, a gain of area  $DEHG$  and a loss of area  $CEF$ . If the former area is greater than the latter, then the importing country has gained from the import tariff. The importing country government is taking advantage of the country's large size to extract surplus from exporting countries. As long as the importing country faces an upward sloping  $ES$  curve, there is an import tariff that will increase welfare for the importing country. The import tariff that maximizes the large country's gain from trade is called the *optimum tariff*. An optimum tariff exists for any large country because its *marginal cost of import* ( $MCI$ ) is always greater than the import price. The reasoning behind this phenomenon is similar to the reasoning behind the marginal revenue curve lying below the demand curve in the monopoly case. The only way a large importing country can get additional output from the rest of the world is to bid up the price. Bidding up the price encourages other countries to produce more and consume less. However, the increased price accrues not only to the last units traded internationally, but also all other units traded. Thus, it costs the large importing country more than the world price to increase imports because it costs the country more than the world price to buy additional units. The example in Explanation Box 3.3 shows this numerically.

#### Explanation Box 3.3 Why is $MCI$ above $ES$ ?

*A simple numerical example can provide useful insights into why the  $MCI$  curve will lie above the  $ES$  curve if the importing country is large. Suppose that the following simple schedule below shows the amount of wheat that the rest of the world is willing to supply a country at different prices (this is a specific example of an excess supply curve, so it has a positive slope):*

Price (per ton)	Quantity (in 1,000 tons)	Total Cost	$MCI$
\$150	100	\$15m	\$150
\$200	200	\$40m	\$250
\$250	300	\$75m	\$350

If the price is \$150 per ton, the world can supply 100,000 tons; if the price is \$200 per ton, the world can supply 200,000 tons; and if the price is \$250 per ton, the world can supply 300,000 tons. Examining this from the importing country's perspective, if they wish to import 200,000 tons rather than 100,000 tons, the added cost is \$25 million and they obtain 100,000 additional tons. Those 100,000 additional tons cost on average \$250 per ton, much more than the original 100,000 tons, because they had to pay more for the original 100,000 tons to obtain the additional 100,000 tons. If the importing country wishes to import 300,000 tons, the added cost for the last 100,000 tons is \$35 million or \$350 per ton. Notice that the marginal cost of importing is increasing at higher import levels (as reflected in the MCI curve relative to the ES curve in Figure 3.7). Finally, if the importing country is small, the world will be able to supply its needs at the same world price so that the marginal cost of importing is the world price (so the MCI curve and the ES curve are identical and flat at the world price).

One can also show mathematically that MCI is always greater than the price by differentiating the total import cost function with respect to quantity imported:

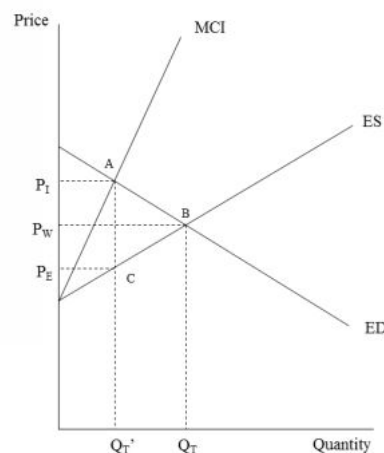
$$TCI = P Q_i \qquad MCI = \frac{d(TCI)}{d Q_i} = \frac{d(P Q_i)}{d Q_i} = P + \frac{dP}{d Q_i} Q_i = P \left( 1 + \frac{1}{E_{es}} \right)$$

Because  $E_{es}$  is greater than zero, MCI is always greater than  $P$ ; and as  $E_{es}$  increases, MCI is further from  $P$ .

The marginal cost of import (MCI) curve is shown in Figure 3.7, lying above the ES curve. If the importing country took advantage of its size in the world market, it would import until the MCI curve intersects the ED curve (where the importing country's marginal costs equals marginal benefit). The quantity imported would be  $Q_T'$  (less than  $Q_T$ ), the price for exporters would be  $P_E$  (lower than  $P_W$ ), and the importing country's price would be  $P_I$ . The large importing country's gain from the tariff (which was shown in Figure 3.6) will be positive, while the exporters (and the rest of the world) would lose. Overall, the world would lose the area ABC because  $P_E$  and  $P_I$  are different than  $P_W$ ; and  $P_W$  reflects the true scarcity of the good.

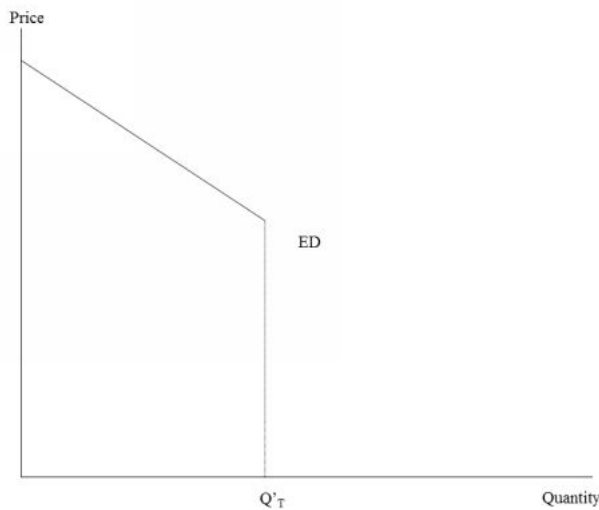
A large country could also impose an optimal import policy by using an import quota. In this case, the country would declare an import quota of  $Q_T'$  and sell the licenses so that the effects were identical to the optimal tariff of  $P_E - P_I$ . Again, though, the dynamic effects of these two policies are quite different. This can be seen by examining the ED curve under an import quota (Figure 3.8). The ED is vertical at  $Q_T'$  under an import quota, whereas the ES shifts upward under the import tariff case (Figure 3.6).

Figure 3.7 Optimal Import Tariff



Note that the optimal tariff for a small importing country is zero because it faces an ES curve that is perfectly elastic. Any tariff imposed by a small country will result in lower welfare for the country.

Figure 3.8 Excess Demand Curve under an Import Quota



### Fixed Internal Prices by Importing Countries

The real reason behind trade barriers for many importing countries is to support domestic producer incomes. Governments weight the producer's welfare more highly than they weight consumer's welfare, especially for agricultural products. Often governments decide what domestic policies they wish to support domestic producers and then determine a trade policy that will allow them to attain their domestic goals. Sometimes these domestic policies involve guaranteed or minimum producer prices. If an importing country wants a minimum producer price that is above the world price, they must have some trade barrier to assure that imports cannot be sold below the minimum producer price. A variable levy will perform this function.

A *variable levy* is a tax applied to imports that assures that they cannot enter a country below a fixed minimum level (often called a *threshold price*). Mathematically, the variable levy is simply the difference between the minimum import price ( $P_T$ ) and the world price.

$$L = P_T - P_W \quad (3.1)$$

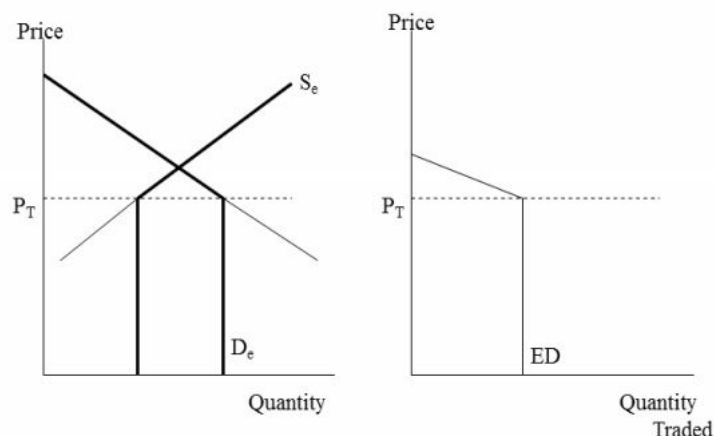
The levy is variable because the world price can vary on a daily basis. This variable levy system guarantees that the higher domestic price will not be undermined by imports. The European Union used a variable levy system for its major agricultural products (e.g., corn, wheat, pork, and beef) until 2003. Under that policy importers submitted bids on the price of their product and the customs authority subtracted the lowest bid from the threshold price (established for that year) to obtain the variable levy for that day. All imports of that product were assessed the variable levy for that day, ensuring that imports were at least as expensive as domestic products.

A variable levy system makes supply and demand points below the threshold price irrelevant because those prices cannot prevail. In other words, the effective demand and supply curves,  $S_e$  and  $D_e$ , become vertical (or perfectly inelastic) below the threshold price, as shown in the left panel of Figure 3.9. This makes the excess demand function for the importing country vertical below the threshold price too, as shown in the right panel. The gains for producers and the government, and losses to consumers can be shown easily in a manner similar to the import tariff case (Figure 3.2).

The main difference between the import tariff case and the variable levy case is highlighted when world supply and demand conditions change. If the world price changes in the import tariff case, there will be a change in the importing country's price, but that is not true in the variable levy case as long as the world price stays below the threshold price. In this regard, the variable levy is more similar to an import quota

because world prices are not transmitted to the importing country.

Figure 3.9 Supply and Demand Curves with a Fixed Internal Price



## Tariff-Rate Quotas

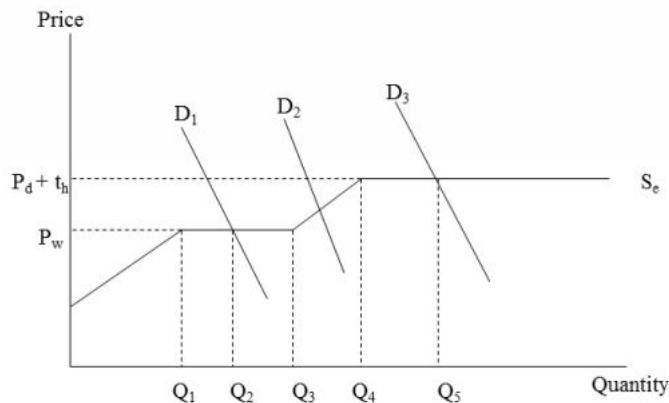
The *tariff-rate quota* (TRQ) has become more popular as countries attempt to lower their trade barriers over time. A TRQ allows a certain amount of imports at a lower tariff (sometimes zero), with imports above the quota assessed at a higher tariff. This concept doesn't make much sense until one considers the context of highly restricted trade. The TRQ allows some minimum access for imports, but domestic prices can still be very high because of the higher tariff for imports above the quota.

Often countries are in a situation where they guarantee that they will simplify their import policies and lower trade barriers significantly over time. The way they simplify them is to move from import bans, licenses, quotas, and other restrictive regulations that may not be completely clear and straightforward to a simple import tariff. In that way, prospective importers know that they will face an import tax, but they will not need to work with a government bureaucracy to obtain a license or go through myriad procedures to receive approval. Importers know that they will be able to get their product through customs as long as they pay the tax. This process of moving from many import barriers to a simple tariff is called *tariffication* -- changing all import barriers into their tariff equivalent.

After the country has moved to a simple tariff, it is easy to measure how fast trade barriers are being lowered because one simply measures how the tariff changes over time. The tariff-rate quota is used to guarantee that there is increased access to the importing country's market through the liberalization process. The import quota might be set at some average import level over the previous few years and the lower tariff might be zero, guaranteeing that imports will be at least as large as they have been in previous years. Imports beyond the quota would be taxed at the new "tariffed" rate. This gives the exporting countries the benefit of not losing their past market when tariffication takes place, and gives them access to a larger market if their price can be competitive with the new tariff.

Figure 3.10 shows the  $S_e$  curve for a small country imposing a TRQ with the lower tariff at zero and the higher tariff at  $t_h$ . The effective supply curve is the lower part of the domestic supply curve below  $P_w$ . It becomes flat at  $P_w$  until the quota is exhausted because the world can send product to the importer under the quota. After the quota is binding, the  $S_e$  curve takes the shape of the domestic supply curve again (as in Figure 3.3) because the least cost way of obtaining the product is by enticing domestic producers with higher prices. Finally, the  $S_e$  curve becomes flat at  $P_w + t_h$  because the importing country can obtain unlimited supplies at that price from the world market. Imports of the country (and domestic price) are determined by where the domestic demand curve intersects  $S_e$ . With  $D_1$  imports are  $Q_2 - Q_1$ , the quota is not binding, and price is at  $P_w$ ; with  $D_2$  imports are  $Q_3 - Q_1$ , the quota is binding, and price is higher than  $P_w$  but below  $P_w + t_h$ ; with  $D_3$  imports are  $Q_3 - Q_1 + Q_5 - Q_4$  and price is  $P_w + t_h$ .

Figure 3.10 Effective Supply Curve for a Tariff Rate Quota



Tariff-rate quotas were very important in the early years of the North American Free Trade Agreement (NAFTA). Both the U.S. and Mexico agreed on TRQs for some products where the quota was based on the average of the previous three years' imports and the tariff was zero. Imports beyond the quota were taxed at a very high rate that reflected the tariffication of import policies at that time. Liberalization occurred through a progressive increase in the duty-free import quota and a progressive reduction in the tariff on imports beyond the quota. TRQs were also an important part of the 1994 GATT agreement, are discussed in Chapter 5.

#### *Discussion Box 3.3 Other Import Policies.*

*Importing countries have thought of many devices to protect their domestic producers. Some countries require that importers use one ton of the domestic product for every ton of product imported. This is called a **mixing requirement** and this guarantees that there is a market for domestic production. Other countries require that all domestic output be purchased before imports are allowed into the country. All of these policies restrict trade and result in lower welfare for the importing country.*

### State Trading

The final form of trade barrier covered in this chapter is when the government has a state-owned organization that controls importation. Normally, with state trading, the government organization is the sole importer and controls the resale price of the imported product. This situation was rather common in the 1960s and 1970s, particularly in less developed countries, but the wave of privatization that occurred during the 1990s has made state trading less common throughout the world. State trading is not consistent with open and free markets. Thus, many major players in the World Trade Organization (especially the U.S.) have vehemently opposed them and worked for their elimination. Each year more state trading firms are closed but they still exist in China and many countries of the Former Soviet Union.

When the government controls importation, many of the other policies covered in this chapter could be implicit in the organization's actions, making for a very restrictive trade policy. The state organization can control exactly how much is imported, since it is the sole importer. The actions of the government agency can serve as an import quota that can change through its own simple actions or dictates. Further, since the government agency sells the imported products in the local market (either directly to consumers through its own stores or to wholesalers), the agency can impose implied tariffs (or subsidies) that will impact its domestic price for the product.

## Summary

1. Trade barriers are used for many purposes, but their intent is normally to protect domestic producers and therefore shift welfare from consumers to producers.
2. Import tariffs increase the domestic price for a good, encouraging production and discouraging consumption. Producers gain, consumers lose, and the government gets a revenue source. However, with a small country, consumer losses are greater than producer and government gains.
3. An import quota specifies the maximum amount that can be imported into a country. Its effect is similar to the import tariff (domestic prices increase if the quota is binding), but the dynamics are different. If there are domestic supply or demand shifts when the quota is binding, the domestic price will also change, whereas it will not change with an import tariff.
4. A large country can gain from an import tariff by significantly reducing world trade. In this case, the large country extracts welfare from other countries by lowering world price, which will reduce welfare of exporting countries. The large country's gain in producer surplus and government revenue exceeds the losses incurred by its consumers.
5. A variable levy is a tax imposed on imports which makes up the difference between a fixed domestic price and the world price. The welfare effects of a variable levy are the same as an import tariff at a point in time, but if domestic supply and demand curves change, there will be no change in the country's importing pattern.
6. A tariff-rate quota is a means to guarantee that some minimum amount (the quota) will be imported at a lower tariff, but imports above the minimum are subject to a higher import tariff. This policy has been popular in recent trade negotiations (GATT and NAFTA).

## Questions

1. Why have import policies become more complex over time?
2. The U.S. imposes relatively high tariffs on sugar and dairy imports. Why do you think the U.S. follows such policies?
3. Why would a government weight producer surplus more highly than consumer surplus? How do you think those weight have changed over time and how will they change in the future?
4. Can you think of instances where countries have imposed import tariffs to take advantage of their market power? Explain.
5. What would the welfare and trade impacts be if the country was large and it imposed an import quota?





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## **Chapter 4 Trade Policies of Exporting Countries**

Policies that drive a wedge between world prices and domestic prices are not unique to importing countries: exporting countries often use policies that affect their trade patterns. Again, these policies are normally used to meet domestic policy objectives, which vary markedly among exporting countries. The common thread, though, is that export policies are normally geared toward increasing exports, rather than keeping production at home.

This chapter covers the main export policies used by countries to influence trade. The assumptions for the analysis of each export policy covered in this chapter will be the same as for the import policies. The analysis begins with the free trade case and measures the losses in welfare by using equal weights for consumers, producers, and the government. Unless otherwise noted, the small country case, zero transport costs and perfect competition are assumed.

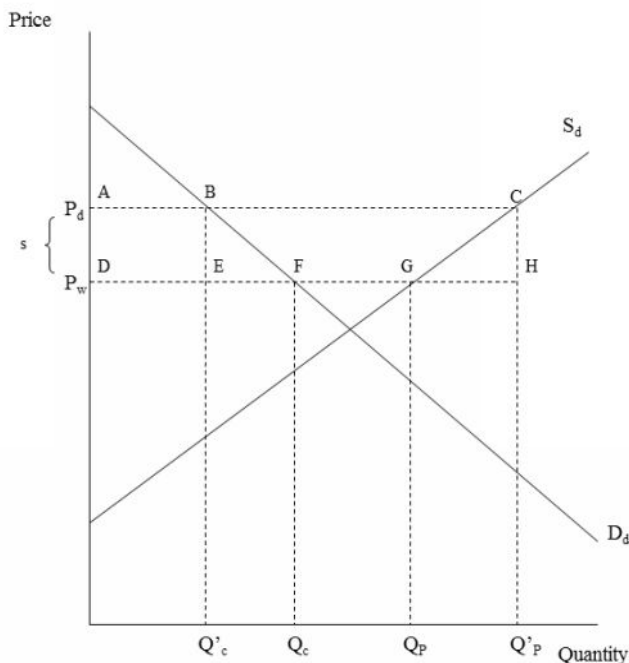
## Export Subsidy

The first export policy analyzed, the export subsidy, is common for agricultural products in more developed countries such as the European Union. An export subsidy allows the domestic price in the exporting country to exceed the world price. This policy is always welfare-reducing if the country weighs producer surplus, consumer surplus, and government revenue equally. Yet it has been a common policy for raw agricultural products.

The export subsidy case for a small country is presented in Figure 4.1, where domestic supply and demand curves are drawn with a price in the exporting country,  $P_d$ , that is above the world price by  $s$  units, the per unit amount of the export subsidy. Presumably the government in the exporting country has determined that its domestic price must be  $s$  units above the free trade price, so the only way that the exporting country can get rid of its surplus ( $Q_P' - Q_C'$ ) at the prevailing domestic price is through an export subsidy of  $P_d - P_W$ . Note that in this example domestic consumers pay the non-subsidized price of  $P_d$  and the effective demand curve for the country is perfectly elastic (or flat) at the domestic price (because the government provides a subsidy to effectively raise the price above  $P_W$ ). If the government chooses to allow domestic consumers to purchase at the world price (through a subsidy), then exports would fall by  $Q_C - Q_C'$ .

Domestic producers benefit from the export subsidy because their surplus increases by  $ACGD$  and consumers lose by  $ABFD$ . The government is also a loser in this case because  $BCHE$  must come out of the government budget to pay exporters to supply  $Q_P' - Q_C'$  to the world market. The net losses to the exporting country are  $BFE$  (from consuming too little) and  $CHG$  (from producing too much). In the world market, the small country faces a perfectly elastic excess demand curve, so the world price does not change with an export subsidy and there are no significant benefits to the rest of the world.

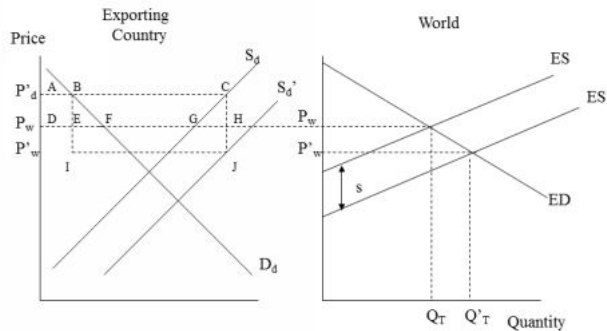
Figure 4.1 Domestic Supply and Demand with an Export Subsidy (Small Country).



The large country case is even more welfare-reducing for the exporting country because the export subsidy results in significantly more exports for the world, which reduces the world price. This result is shown in Figures 4.2 using two panels of the three-panel diagram. The export subsidy causes the excess

supply curve to shift downward by the amount of the subsidy, lowering world price to  $P_W'$ . The domestic price in the exporting country goes up by less than the amount of the export subsidy because the world price has fallen (rather than being  $P_W + s$ , the new price in the exporting country,  $P_d'$ , is  $P_W' + s$ ). Consumer losses ( $ABFD$ ) and producer gains ( $ACGD$ ) are much less than when the country was small. The government still loses the export subsidies that are paid ( $BCJJ$ ). The triangular losses for consumption ( $BFE$ ) and production ( $CHG$ ) are less, but the net loss to the country ( $BFE + CHG + EHJJ$ ) is greater. Clearly the net losses from the export subsidy are greater for the large country (Figures 4.2) than for the small country (Figure 4.1).

Figure 4.2 Export Subsidy When the Country is Large



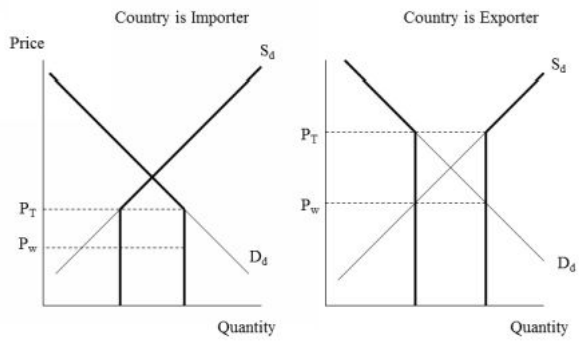
Despite this result, some large exporting countries continue to subsidize exports. One potential reason is that they value producer surplus more than consumer surplus or government revenue (cost). If you weigh producer surplus high enough (relative to consumer surplus) in the country's social welfare function, the country can gain from the export subsidy. For many years the U.S. used targeted export subsidies to combat subsidies by other countries, specifically the European Union. These targeted export subsidies reduce government costs because the subsidies were only given for certain markets where the U.S. competed with export subsidies from other countries (particularly the E.U.). The U.S. argued that this was a strategy to combat the E.U. export subsidies (and preserve some markets for U.S. farmers) while reducing welfare losses from export subsidies. Yet some agricultural economists saw this as a very poor strategy and argued that such a battle would not reduce export subsidies (Leathers). Most targeted export subsidies by the U.S. ended in late 1990s but some export subsidies continue on selected products.

The European Union is forced to subsidize exports when their domestic prices (decided upon through the Common Agricultural Policy (CAP)) are higher than the world price and the E.U. produces more than it consumes. Recall the variable levy system that prevailed for many agricultural products in the E.U. (Chapter 3). When the CAP was formulated in 1958, the supply-demand situation was such that the autarkic price was above the threshold price (guaranteed minimum price), so the E.U. consumed more than it produced. Over time, because of higher internal prices, technological advances, efficiency gains, and other factors, the E.U. supply-demand situation changed such that the autarkic price was below the threshold price, so the E.U. produced more than it consumed. The CAP has changed so that variable levies are no longer used, but prices are still supported at levels above the world price. This forced them to subsidize exports.

The two situations that the E.U. faced with its CAP and variable levy system over time are shown in Figure 4.3. The left panel is the situation when the E.U. was a net importer with a variable levy system (this is identical to the left panel in Figure 3.7) and the government receives revenue from the variable levy. The right panel is the situation when the E.U. moved to a net export position with a variable levy system. The supply curve shifted out enough that its relevant portions lie to the right of the demand curve, making it necessary for the E.U. to export if the internal price is to remain at  $P_T$ . The E.U. is forced to provide a subsidy of  $P_T - P_W$  if exports are to occur. Without exports, there is no way to get rid of the surpluses through market forces.

Some economists have performed analyses of export subsidies that attempt to explain why governments (particularly in more developed countries) choose to subsidize exports when welfare losses are so clearly present (Alston, Carter, and Smith). They argue that under some conditions, an export subsidy can be a least costly means of redistributing income to producers (the Efficient Redistribution hypothesis). Another idea is that governments simply want to make producers happy without causing too much protest on the part of consumers. If consumers don't know about the government costs from subsidies and feel that their prices are low (the good is exported, so the price should be low in the exporting country), they will not protest.

Figure 4.3 Effective Demand and Supply Curves With a Variable Levy



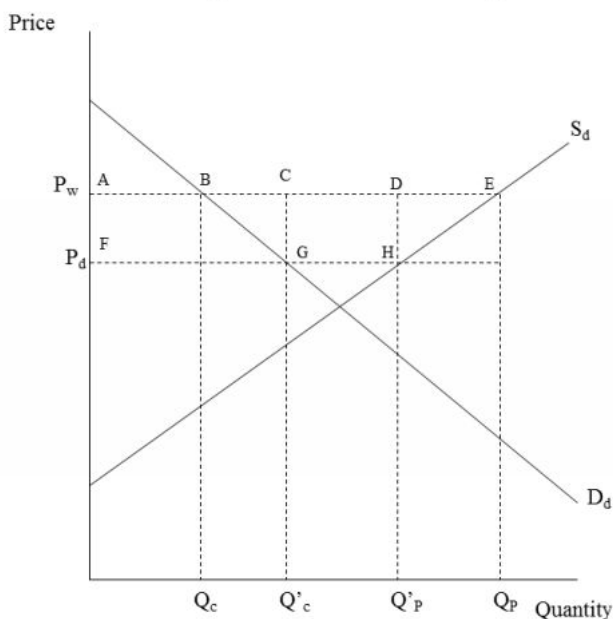
## Export Tax

Export taxes can be collected directly from exporters or indirectly through a government marketing board that pays producers a price lower than the world price. Export taxes are more prevalent in less developed countries because they are an easy way for the government to obtain money from one of the few viable industries in the economy: agriculture. Governments may realize that this distorts economic decisions in the country, specifically distorting prices in agriculture, but these distortions are simply the cost of obtaining operating funds for the government. Unfortunately there can be long-run consequences by keeping agricultural prices low for long periods of time (such as a lack of investment, little incentive for research).

The export tax forces the price in the exporting country below the world price by the amount of the tax so that the effective demand curve is flat at a price below the world price ( $P_d$ ). If a small country is involved, the domestic price will fall by the full amount of the tax, as shown in Figure 4.4 (domestic price falls from  $P_w$  to  $P_d$ ), reducing exports from  $Q_p - Q_c$  to  $Q'_p - Q'_c$ . Producers lose from this policy because they receive a lower price and they also cut back on production. Producer surplus falls by the area  $AEHF$ . Consumers are allowed to purchase the product domestically at the lower price, so they gain area  $ABGF$ , and the government collects revenue of area  $CDHG$ . The country as a whole loses the two familiar triangles, areas  $BCG$  and  $DEH$ , which are the consumption and production losses, respectively.

There is no question that a small country will lose from an export tax. However, this is not true if the country is large. A large country can hold production off the market and force the world price higher, allowing the possibility that the country could gain if the production cutback is small relative to the world price rise. The way the government can encourage exports to fall is to implement an export tax.

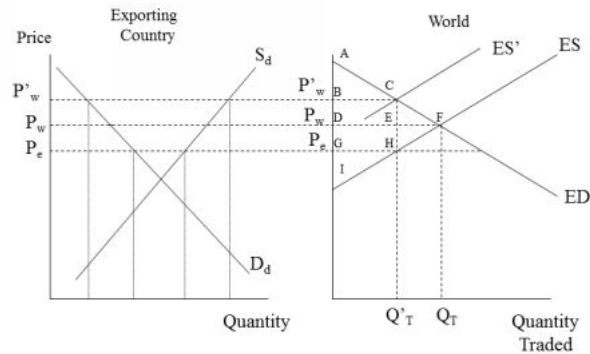
Figure 4.4 Effects of an Export Tax on a Small Country



The general case of an export tax with a large country is given in Figure 4.5. The tax shifts up the ES curve so that the exporting country's price ( $P_e$ ) and the new world price ( $P_w'$ ) differ by the amount of the export tax, as shown in the right panel; reducing the quantity traded from  $Q_T$  to  $Q'_T$  and driving a wedge between the exporting country's price,  $P_e$ , and the new world price,  $P_w'$ . World price increases from  $P_w$  to  $P_w'$  because of the export tax (the large exporter has held some output from the world market so price increases). The figure does not show it, but the ES curve has shifted such that it moves through point C. The gains from trade for producers and consumers in the exporting country are area  $GHI$ , the gains for the importing country have shrunk to area  $ABC$ , but the exporting country's government has gained the area  $BCHG$ , making it possible for the exporting country to be a net gainer (in particular if area  $BCED$  is greater

than the area  $EFH$ ). There is no question that the importing country loses because of the export tax (area  $CEF + BCDE$ ) and the world loses (area  $CFH$ ). In this case the exporting country has extracted welfare from the

Figure 4.5 Effects of an Export Tax on a Large Country



importing country (area  $BCDE$ ).

The left panel, which shows the effects of the export tax on the domestic supply and demand situation, is similar to Figure 4.4 for the small country, except that the world price has increased, reducing the loss triangles and exposing an area of gain for the exporting country because of the higher world price. The gains from the policy can also be highlighted in the left panel, but that is left to the reader.

For every large exporting country there is an optimal export tax that will maximize the country's total welfare (producer surplus, consumer surplus, plus government revenue). This optimal export tariff exists because the marginal revenue from exporting for a large country is less than the world price. The only way the exporting country can increase exports is by reducing the price on all of its exports (Discussion Box 4.1). Thus, the *marginal revenue from exporting* (MRE) curve lies below the  $ED$  curve faced by the large country, as shown in Figure 4.6. The welfare-maximizing exports for the large country are where MRE is equal to  $ES$  (or marginal cost of exporting). This level of exports is shown as  $Q_T'$ , which is lower than  $Q_T$ , the free trade level of exports. The optimal export tax in Figure 4.6 is  $P_w' - P_e$ . This allows the exporting country to have producer and consumer gains from trade equal to area  $EFG$ , plus government revenue of area  $ABFE$ . By construction this should have more welfare to the country than the free trade equilibrium (though the importing country suffers a large welfare loss from the tax).

**Discussion Box 4.1 Elasticity of MRE and ED Curves**

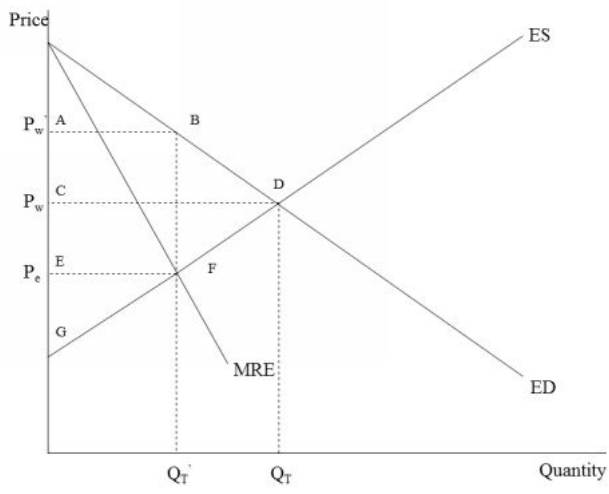
*One can see that MRE is always less than the price by differentiating the total export revenue function:*

$$TRE = P Q_e \qquad MRE = \frac{d(TRE)}{d Q_e} = \frac{d(P Q_e)}{d Q_e} = P + \frac{1}{E_{ed}} (P Q_e) = P \left( 1 + \frac{1}{E_{ed}} \right)$$



*Because  $E_{ed}$  is less than zero, then MRE is less than  $P$ . Further, as  $E_{ed}$  increases, MRE is closer to  $P$ .*

Figure 4.6 The Optimum Export Tariff for a Large Country

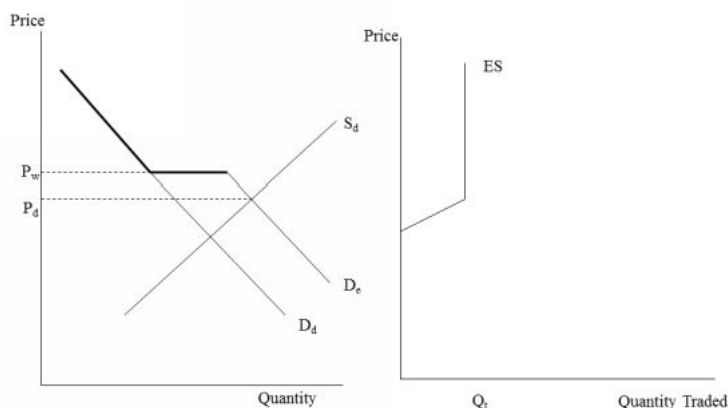


## Export Quotas

Export quotas are not common, but they do appear at times. It is likely that the export tax is an easier way to enact a policy where the exporting country lowers its domestic price relative to the world price. The static effects of an export quota are identical to an export tax (the results in Figure 4.4 are identical to an export quota of  $Q_P' - Q_C'$ ). There will be losses for a small country and a potential gain for a large country (just as in the export tax case), but the gains will depend on who has the right to export (who has the export quota licenses). That right allows someone to purchase the good in the exporting country at  $P_d$  and sell in the world market at  $P_w$  (and remember that all costs of exporting are assumed to be zero, so that person gains a nice profit). If the government auctions that right in a perfectly competitive market, the right will sell for  $P_d - P_w$  and the government will gain that surplus (much as it gets money through the export tax). If it gives that right away, then others will gain that surplus.

The dynamic effects of the export quota, much like the import quota, are different from the export tax because the effective demand and excess supply curves are different, as shown in Figure 4.7. The effective demand curve facing the exporting country is flat at the world price as long as the export quota is not binding. If the export quota is binding, the effective demand curve is downward sloping; reflecting the fact that domestic price must fall below the world price in order to encourage domestic consumers to purchase the available supply from producers (to  $P_d$  in Figure 4.7). The excess supply curve for the exporting country is also vertical at the export quota. Notice if the world price changes, there is no adjustment in production or consumption by the exporting country as long as the export quota is binding (similar to the lack of adjustment by importing countries under an import quota).

Figure 4.7 Effects of an Export Quota



Export embargoes are a special case when the export quota is zero. This embargo can involve all exports from the country or it can involve exports to a specific country (Discussion Box 4.2 outlines the effects of an export embargo for a specific country). During the commodity price boom of 2007/2008, many grain exporting countries (including Argentina, Kazakhstan, Russia, Ukraine, and Vietnam) instituted export embargoes to keep their domestic prices low for important staples. They were afraid that all of the grains would be exported and not available for domestic consumers (or that domestic consumers would be forced to pay “too much” for these grains to keep them from exiting the country). These policies resulted in panic buying throughout the world and riots in importing countries because of increased food prices and a call for ways to provide assurances to importing countries that they will have access to grains and other food items when production shortfalls occur or other factors cause prices to increase.

### Discussion Box 4.2 Export Embargos

*The U.S. has used embargos on agricultural exports periodically as a foreign policy tool. This chapter does not cover the economics of such a policy, but it obviously hurts agricultural producers. Two notable U.S. agricultural embargos are occurred since 1970 – the soybean embargo of 1974 and the Russian embargo of 1980. In both cases, the U.S. embargo merely forced importers to use other means to obtain their needed food supplies. Yet, there were long-term consequences.*

*In June 1973, the U.S. price of soybean meal was more than three-times that of the previous year. There was tremendous political pressure to control this serious price increase, so the U.S. placed an embargo on all oilseed exports on June 27. Five days later, the U.S. announced an export licensing scheme that lasted until October, 1973. The U.S. Department of Agriculture's commissioned study found that there were little short-term or long-term effects of the embargo. Yet some economists argue that the Japanese began to invest directly into Brazil's soybean industry after that time (Tweeten).*

*The 1980 embargo on U.S. agricultural sales to the USSR was imposed to punish the USSR for its invasion of Afghanistan. The embargo lasted from January 1980 to April 1981. Grains were the most important commodities influenced by the embargo. The U.S. Department of Agriculture's commissioned study found that the embargo had little impact on Soviet imports or consumption levels. The Soviets simply changed the sources of agricultural supplies. The U.S. did implement agricultural programs that compensated farmers for lost Soviet markets.*

*The conclusion from these embargos and other embargos, though, is that they rarely make much difference to the countries involved. Product distribution patterns might change during the embargo, but countries can usually find the products that they need to feed their people. After the embargo, normal commercial channels are followed and there is little change in the way business is conducted. Some importers might complain of supply reliability, but in the final analysis, they are mostly interested in finding products at the lowest price possible.*

When one moves to an analysis that involves many exporters and importers, there are interesting dynamics when one country imposes an export tax or embargo. When one exporting country imposes an export tax, all other exporters gain because the world price increases. Furthermore, those other exporters will gain more than the exporter that imposes the tax (or quota) because they receive the benefits of the policy without paying the costs. The costs for a small exporting country are area  $BCG + DEH$  in Figure 4.4 or area  $DFHG$  in the right panel of Figure 4.5 for a large exporter. Economists say that other exporting countries are getting a free ride from the country imposing the export tax.

When one introduces many countries, there can be gains for all of the exporting countries if they ban together and reduce their exports (and production) in order to uplift world prices (because they would certainly face a downward sloping ED curve). That is why cartels are formed for some commodities (for instance, there have been coffee and cocoa cartels through international agreements but both agreements have fallen apart). If the exporters can agree to cut production, they will all share in the gains from a higher world price (and share in the smaller losses from inefficient use of resources). However, there is a strong incentives for an individual country to cheat by not reducing its exports (become a free rider) because then it will gain more because it doesn't suffer the losses from lowering domestic production. The best known cartel is OPEC, which accounts for a large percentage of oil exports, but non-OPEC oil exports benefit greatly from OPEC production quotas because they can produce as much as they wish.

## Price Discrimination

With an optimal export tax the exporting country has extracted rents (or surplus) from the rest of the world by holding down exports and increasing the world price. The rest of the world is a net importer, so it is a net loser when the world price increases. This situation exists because the exporting country faces a downward sloping excess demand curve. Discussion Box 4.1 shows that the more elastic (flatter) the ED curve, the smaller is the optimal export tax because MRE lies closer to ED.

If the exporting country acts as a profit-maximizing (or surplus-maximizing) monopolist, the country will segment its markets and charge different prices to different markets (this is sometimes called pricing-to-market; see Discussion Box 4.3). The exporting country can extract more rents from those countries that are willing to pay more because of demand and supply conditions. In this situation the exporting country would sell until MRE was equal to its marginal cost in every country. This decision-rule would result in lower prices in importing countries with a more elastic excess demand curve and higher prices in importing countries with a less elastic excess demand curve. The exporting country would be charging a higher price (and extracting more rents) from importing countries that were not price responsive, and charging a lower price in importing countries where there was more competition.

### *Discussion Box 4.3 Pricing-to-Market*

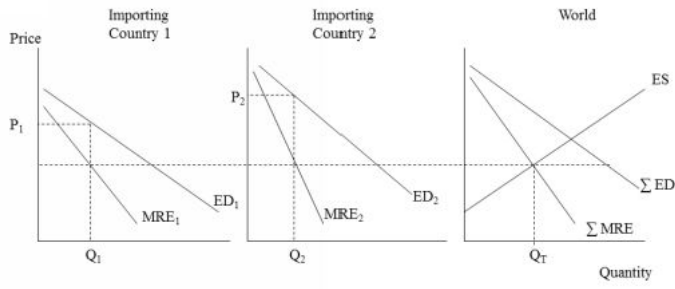
*There is a large literature that investigates whether some exporters offer different prices among customers – the pricing-to-market literature. This research was founded by Paul Krugman, who noticed that at times exporters didn't always change their prices as exchange rates changed. The idea is that if prices in the exporter's currency are the same for all countries, then as the exchange rate for one country changes, the price in that country's currency should also change. Many researchers have found that exporting countries do not change all of their prices by the same percentage as the exchange rate changes; thus, pricing-to-market does take place and they argue that this indicates there is price discrimination by some exporters. Knetter's two papers are the most heavily cited, but Pick and Carter's work concerns agricultural products. Pick and Carter found that there was pricing-to-market for U.S. and Canadian wheat exporters.*

An example of this situation with one exporting country and two importing countries is shown in Figure 4.8. The left panel shows the excess demand curve and corresponding MRE curve for country 1 (an importing country) and the middle panel shows the same curves for country 2 (another importing country). The right panel shows the horizontal summation of both curves for the two countries and the excess supply curve for the exporting country. If the exporting country exploits its market power and equates the summed MRE curve in the right panel with the ES curve (its marginal cost curve) to determine how much it supplies the two markets, the export levels would be  $Q_1$  and  $Q_2$  ( $Q_T = Q_1 + Q_2$ ), with the corresponding prices at  $P_1$  and  $P_2$ . Note that country 1 has a lower price because its ED curve is flatter (more elastic).

The key to the price discrimination case, though, is making sure that the product cannot flow among importing countries; otherwise the price differences among countries can vary no more than transport costs (which we have assumed are zero). Easy markets for the exporting country to discriminate between, though, are the domestic versus the export market, since transport costs and import barriers often preclude sending the good back to the exporting country. The domestic demand curve in the exporting country is also usually much less elastic than the excess demand curves faced in international markets, so there is often fear that exporting countries will charge lower prices for exports than for domestic sales (the classic dumping case)[\[10\]](#). Most countries have laws against foreign companies dumping products on their markets (selling below the price

they sell in their own country), but it is sometimes very difficult to prove dumping cases.

Figure 4.8 Price Discrimination With Two Importing Countries



#### *Discussion Box 4.4 Other Means of Export Enhancement*

*The U.S. Department of Agriculture has employed other means of increasing agricultural exports at times. These programs do not fit neatly under any of the categories covered elsewhere in this chapter. All of the programs here are authorized under the 1978 Trade Adjustment Act and are ways that the U.S. government subsidizes exporters or exporter organizations. Some of these practices, particularly some of the export subsidy programs, have been discontinued because of commitments made during WTO negotiations. There was a long-standing argument by some countries that the General Sales Manager (GSM) programs are disguised export subsidy/price discrimination programs of the U.S. (charging lower prices to countries with lower price elasticities). This controversy was the impetus for the elimination of the GSM 103 program.*

*The oldest program is the Foreign Market Development Program (also known as the Cooperator Program), which provides matching support for producer organizations to promote exportation of products throughout the world. The Federal funds for this program totaled \$34.5 million in fiscal year 2010. Through such organizations as the U.S. Wheat Associates, U.S. Meat Export Federation, and other groups, U.S. exports of agricultural products are promoted at trade fairs, exhibitions, media campaigns, and other events.*

*The GSM 102 and 103 programs underwrite (guarantee) credit extended by U.S. commercial banks to less developed countries. Countries and commodities for GSM support are approved annually. The GSM 102 program extends credit for up to three years, while the GSM 103 program extends credit for up to ten years. However, the GSM 103 program is no longer active. This credit subsidy allows U.S. firms to sell products to countries that might not otherwise be able to afford imports. For fiscal year 2009, GSM 102 credits taken by U.S. exporters totaled \$5.3 billion.*

*Finally, there is the Market Access Program (also known as the Targeted Export Assistance Program and the Market Promotion Program), which provides matching support to individual U.S. producers, exporters, trade associations, others in their quest to develop international markets for their products. This program was originally designed to combat export subsidies by U.S. competitors in specific markets. However, the program has been generalized and is available for U.S. products being shipped throughout the world, though countries and products are approved based on a competitive process. The Market Access Program had a \$200 million budget for fiscal 2010.*

*Some countries also argue that U.S. food aid is another form of export subsidy employed by the U.S. government. In this case, the food is purchased by the government and distributed in various ways to less developed countries through disaster relief or through sales of the commodities in non-commercial channels. This practice tends to lower food prices in less developed countries and therefore discourages agricultural production and encourages increased dependency. Some donor countries (the E.U. and Japan) have changed to providing cash to the recipient countries so that they can purchase food from whatever source fits their needs (including from local farmers or neighboring countries). The practice of giving cash will tend to increase local food prices rather than lower them (encouraging local production).*

## **Other Important Policies that Affect Exports**

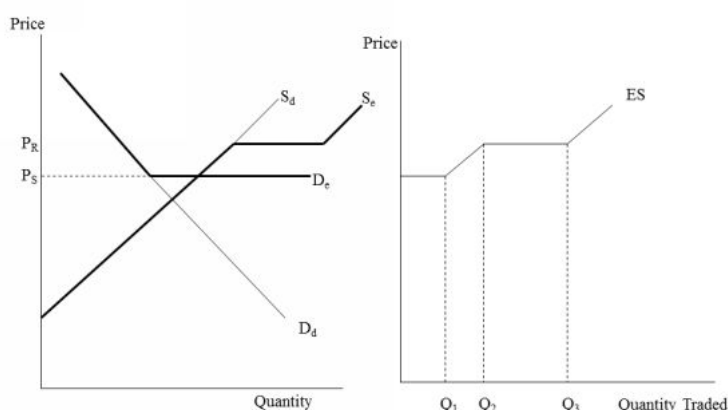
There are two other policies followed by exporting countries which are not trade policies, but have an effect on international trade. The United States has used both policies, but it has been a while since the U.S. used the price support system. Other countries have had similar price support systems at times more recently. A discussion of these programs sheds additional light on how policies that are sometimes viewed as purely domestic can have large impacts on international trade.

## Price Supports

The price support system was a major policy in U.S. agriculture from 1933 through 1985. The price support system had many facets and changed from year to year, but its basic concept was that a minimum price was established and the government purchased (or loaned farmers money to store) the product at that support price. Accumulated surpluses came out of storage at a release price. This program made sense as long as the price support was low relative to the long-run price of the product and accumulated surpluses didn't become burdensome.

The left panel of Figure 4.9 shows the effects of a price support policy on effective supply and demand curves. The effective demand curve ( $D_e$ , the darkened part of the demand line) is the domestic demand curve at higher prices, but becomes perfectly elastic at the price support,  $P_S$ , because of government purchases. The effective supply curve ( $S_e$ , the darkened part of the supply line) is the supply curve below the release price, but it becomes perfectly elastic at the release price ( $P_R$ ) until government carryover stocks are exhausted, when it returns to the shape of the domestic supply curve. The excess supply curve in the right panel is consistent with the effective demand and supply curves. Carryover stock levels will determine the extent that the effective supply and the excess supply curves are flat at the release price. If the ED curve intersects with ES before  $Q_1$  the exporter will be exporting but also accumulating stocks and the price support will prevail. If the ED curve intersects between  $Q_1$  and  $Q_2$  the exporter will be exporting but not accumulating stocks so the price will be above support levels. If the ED curve intersects between  $Q_2$  and  $Q_3$ , the release price will prevail and the exporter will be exporting and some of those exports will come from stocks. Finally, if the ED curve intersects beyond  $Q_3$ , the price will be above the release price and all stocks will have been sold.

Figure 4.9 Price Support System for an Exporting Country



The price support policy was common for grains, and the U.S. accumulated large stock levels in the 1950s, 1960s, and the late 1970s and early 1980s. The U.S. became known as a residual supplier of grains because importers knew that any shocks to grain prices would be absorbed by the U.S. If world production was large for a particular year, the excess demand curve would fall to the price support level and the U.S. would purchase a high percentage of the U.S. crop, uplifting world prices. If world production was low for a particular year, importers could always go to the U.S. and purchase grain at the release price. One can imagine that U.S. exports fluctuated a great deal because the storage program absorbed much of the market shocks.

When carryover stocks were very high, or when the price support was high relative to the world price, the ES curve for the U.S. had large portions that were flat and other exporting countries were careful to price their product just below the U.S. price so that all of their output would be sold. Bredahl and Green analyzed this issue in the late 1980s. If the price support is above the world price, then the exporter government must purchase all of its excess production or subsidize its exports. Furthermore, it must make sure that foreign production does not enter the country for sale at the support price.



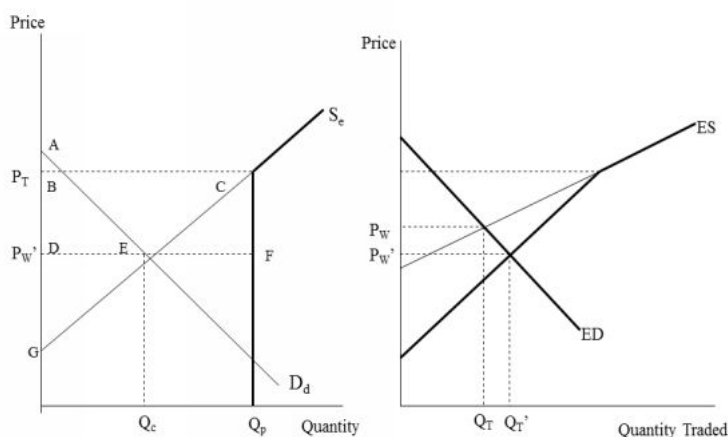
## Deficiency Payment System

In 1986, the U.S. instituted a second policy to complement the price support system: the deficiency payment scheme. Here, the U.S. government guaranteed that producers would receive a fixed target price ( $P_T$ ) each year, but market prices were allowed to be determined by supply and demand (the government would not purchase grain or encourage storage). Any difference between the market price and the target price was made up by a government payment directly to producers. Producers would make decisions based on the target price, while consumers (domestic and international) would make decisions based on the market price.

Figure 4.10 shows the deficiency payment scheme when the country is a large exporter. The left panel is the exporting country's domestic supply and demand situation. The effective supply curve is vertical below  $P_T$  (because producers know they will receive at least the target price) while the entire domestic demand curve is relevant ( $D_d$  is the effective demand curve). Exports are equal to the difference between domestic supply and demand, so exports increase under a deficiency payment scheme. If the world price is at  $P_W'$  with a deficiency payment program, the country will produce  $Q_p$ , consume  $Q_c$ , and export the difference ( $Q_T'$ ).

Producers like this policy because their surplus is quite large (area  $BCG$ ) and consumer surplus is also large (area  $AED$ ). However, government costs are relatively high (area  $BCFD$ ). Furthermore, world prices are lower if the country is large (as shown in Figure 4.10) because production is substantially increased. The net losses from this policy for a small country, though, are small because consumer prices are not distorted (only producer prices). In a pure deficiency payment scheme, there are no stock buildups or trouble in selling internationally because there is no support price which is above the world price.

Figure 4.10 Deficiency Payment System for a Large Exporting Country



The right panel of Figure 4.10 shows the excess supply curve for the exporting country. It is kinked at  $P_T$  because at prices below  $P_T$  there are no supply effects from a lower world price (producers in the exporting country disregard  $P_W$  because they are guaranteed  $P_T$ ). Figure 4.10 shows what the world price and quantity traded would be without the deficiency payment ( $P_W$  and  $Q_T$ , respectively). If the country is large (as the U.S. is in most grain markets), the deficiency payment scheme results in a lower world price ( $P_W'$ ) and larger volume of world trade ( $Q_T'$ ).

## Marketing Boards

The exporting country's counterpart to state trading is the marketing board, which is a government organization which controls exports of a product. As with state trading, marketing boards can allow implicit tariffs, subsidies, or quotas on exports through their operations. There are three general types of marketing boards (Bray et al.): negotiating agencies, which control access to the exporting country's product; central selling agencies, which own the exporting country's product so that all purchasing for export must be done through them; and price and volume regulating agencies, which control prices, production, and all aspects of policy for the exporting country's product.

The government wants these activities performed by a marketing board to influence prices received by producers, reduce price fluctuations, and standardize the terms of sale. If the marketing board purchases the product below world prices and exports the product, there is an implied tax on producers, which is a common occurrence in less developed countries. If the marketing board purchases the product above the world price and exports the product, there is an implied subsidy. Often, though, the marketing board only wants to smooth out prices over the years so that producers do not face wildly fluctuating prices on a yearly basis. A potential problem, however, is that secular downward prices can cause the implied subsidy to increase each year.

The Canadian Wheat Board (CWB) was a good example of a marketing board that has all three of the above-mentioned objectives. Until 2012 (when the law was changed), all Canadian exports of wheat, barley, and durum had to come from the CWB. The CWB was also the sole seller of these products for human consumption. The Board dated back to 1917, but it had been the sole marketing agent since 1943 for wheat and since 1949 for other products.

The CWB wanted to move all Canadian grain at world market prices without holding government stocks. The Canadian grain elevator and transportation system has limited capacity, so it was always major challenge for the CWB. The CWB used rail subsidies (to the West Coast Canadian ports) to make sure that grain flowed to export points in an orderly manner. The CWB didn't handle the grain itself, but allowed grain to enter into the marketing system slowly through the quota system it had with farmers. Each farmer had a quota and the CWB called for delivery of the quota throughout the year as sales commitments were made.

The CWB followed a pooled pricing system. Farmers received an initial price upon delivery and that price (normally about 70% of the world price) was essentially the price guarantee. The farmer received other payments throughout the year based on the prices the CWB received. Each Canadian farmer received the same net price for each grade and class of grain, after accounting for the transportation costs they incurred to get the grain to the terminal elevator.

There was always a debate in Canada as to whether the CWB was less efficient than a free market system, such as in the U.S. Some argued that the CWB was very flexible in its marketing decisions and generated tremendous benefits for Canadian grain farmers. Schmitz et al. argued that studies consistently found that the CWB obtained price premiums over a multi-seller arrangement (such as in the U.S.) because the CWB price discriminated among its buyers. The Export Enhancement Program of the U.S. and the European Union export restitutions (both are subsidy schemes) encouraged Canada to price discriminate among destinations for their wheat, charging high prices where U.S. and E.U. wheat was not subsidized.

Schmitz et al. also argued that there was a price premium on Canadian wheat because of its focus on quality throughout the production and marketing system. Government involvement in the marketing system allowed the control of quality and more assurance in transactions. Some observers argued that the U.S. grain marketing system has an incentive for companies to market lower quality grain or at least to make sure that the grain falls within the lower segment of a quality grade. This is not true with the CWB. Yet the decision in 2011 to disband the CWB seems to be an irrevocable decision.

## Summary

1. Export subsidies result in net losses to the country (losses to consumers and the government, while producers gain). The losses increase if the country is large because there is a further loss because the increased exports lower the world price.
2. Export taxes increase welfare to consumers, increase tax revenue to the government, but result in losses for producers. In the small country case there are net losses to the country. It is possible that the country will be a net gainer if it is large because the country restricts exports and increases the world price.
3. If the country is large and it can segment its markets, it will maximize its welfare by selling in each market until the marginal revenue in exporting (MRE) is equal to its marginal cost. The country would charge a high price in countries where demand is relatively inelastic and a lower price in more elastic markets.
4. Price support programs and deficiency payment schemes change the shape of the effective export supply curve for the exporter. The price support program makes the effective export supply curve flat in two places, whereas the deficiency payment scheme kinks the effective export supply curve at the target price.

## Questions

1. Countries clearly lose when they subsidize exports. Why does the U.S. continue to subsidize exports of some of its products?
2. Export taxes are unconstitutional in the U.S. Why do you think that is?
3. Can you think of instances where price discrimination is allowed in the U.S.? What examples are there in international trade?
4. Why did the Canadian government decide to disband the wheat board?
5. How would an export quota be integrated into a supply-demand graph? What would the effective supply curve be?

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## **Chapter 5                    Technical Barriers to Trade**

Technical regulations and rules (or barriers) are imposed on imports to make sure that international trade does not spread pests, diseases, and other problems to the importing country, and to ensure that imported products meet the same standards required of domestic products. These technical standards include rules for quality, packaging, labeling, standards of identity, and conformity assessment. Some of these regulations help increase the information flow in the marketing process and allow consumers to be informed of product origin, safety, and quality. Other technical regulations or barriers include sanitary and phytosanitary (SPS) regulations on plants and animals to ensure that traded products are not infected with harmful pests or diseases.

New technical regulations on international trade are increasing because of growing demands for enhanced food safety and for an environment that is free from pests and diseases. Consumers want assurances that imported food passes the same health and safety standards which apply to domestic foods. It is natural that as domestic food standards increase, as a result of heightened consumer awareness and enhanced detection technology, so do imported food standards.

This chapter covers general issues associated with technical barriers (their justification, effects, and problems) and specifically looks at how technical barriers have been handled in the Uruguay Round of the GATT negotiations. Specific examples of disputes involving technical barriers lend insight into the many problems (mostly political) that come about with liberalization of barriers. The chapter concludes with details on ways of measuring trade barriers quantitatively.

## General Issues

There have been long-standing concerns that imported products could harbor harmful nonindigenous species of pests and diseases that could present problems for domestic agricultural industries. Some examples of harmful nonindigenous species that have been brought to the U.S. include aphids, gypsy moths, and fire ants. It is estimated that 50-75% of the weeds in the U.S. and 40% of the pests are nonindigenous (OTA). Thus, countries have a right to protect their domestic industries through technical barriers, and they are allowed under GATT section 20 regulations on health and safety.

Yet, there are concerns that many of these technical barriers are really disguised means of protectionism, brought about because there are limited opportunities for other GATT-legal tariffs and non-tariff barriers. Some observers argue that governments are relying on technical barriers to keep imports out and domestic industries more profitable (Orden and Roberts). There is no question that product standards can affect the cost competitiveness of imported products, so it is important that these standards be justified or imported products will be at a disadvantage. The possibility that technical barriers are disguised economic barriers has led to calls for a more scientific approach to justifying and establishing technical standards.

In dealing with technical standards, however, one must also deal with risk, because it is virtually impossible to eliminate the chance that undesired outcomes will occur<sup>[11]</sup>. Yet there are ways to quantify the risk associated with a particular occurrence and develop a system to ensure that the risk of a bad occurrence is less than some acceptable level. Science can provide quantitative assessment of risks, but it cannot provide answers on acceptable levels of safety. Acceptable levels of risk are normative issues that often come from society or the government. Very low tolerance of risk will generate a demand for very strict technical barriers, while higher tolerances will generate looser technical barriers.

The GATT anticipated problems with the establishment and operations of technical barriers to trade in the 1960s. During the Tokyo Round of GATT negotiations (1974-79), the Technical Barriers to Trade (TBT) agreement was enacted, which aimed at protecting the consumer against deception and fraud in product standards. The TBT agreement specified that all technical standards and regulations must have a legitimate purpose (to provide information on the product or protect against harmful pests or diseases). The cost of implementing the standard must be proportional to the purpose of the standard, meaning that the costs of implementing the standard cannot be many times the value of the standard in terms of health and safety protection. Finally, the agreement stated that if there were multiple ways of attaining the objective, the least trade-restricting method should be chosen. These are all familiar GATT ideas and expressions that are based upon the founding principles of liberalized trade.

The TBT agreement from the Tokyo Round was an important first step, but there was a general consensus that the agreement failed to stem the proliferation of technical regulations (Roberts). The pressure to protect domestic agricultural industries, more scientific findings related to health and food safety, and more accurate detection technology has helped to bring about more barriers and more disputes associated with those barriers. There was not enough legal force behind the GATT dispute settlement procedures before the Uruguay Round, and there was no structured mechanism to reach agreement on legitimate standards and regulations.

## Uruguay Round

The Uruguay Round's Agreement on the Application of Sanitary and Phytosanitary Measures (the SPS agreement) defined basic GATT principles behind use of SPS barriers to trade. The first principle is that countries have the basic right to institute SPS measures that protect plant, animal, and human health when they are based on scientific principles. These measures cannot discriminate between members where identical or similar conditions prevail. If the E.U. and U.S. have two different scientifically valid means of assuring that milk is pure, the U.S. cannot insist that the E.U. follow its procedure. The U.S. must allow imports from the E.U. that follow the E.U.'s scientifically valid methods.

A second principle is that members should base their SPS requirements on international standards, guidelines or recommendations when they exist, although they can institute higher standards if there is a scientific justification. This implies a need to harmonize SPS measures among countries so that international trade will flow more easily and production processes can be geared toward one set of regulations. New Zealand is a major exporting nation for many agricultural products. Its beef industry must conform to standards in the E.U. and U.S.; its apple industry must conform to standards for countries throughout the world associated with the 146 organisms that affect mature fruit (Johnson). A common world standard for SPS and other TBTs would be helpful for New Zealand and other exporters.

A third principle is that members are obliged to recognize measures adopted by other countries that provide equivalent protection. This is the concept of equivalency and means that countries should view the end product rather than the process that is used to meet the standards. The Japanese cannot reject a fumigation used by the U.S. simply because it is not used in Japan. If the method is safe and effective on a scientific basis, the Japanese must recognize it as equivalent.

A fourth principle is that members should base their SPS measures on a risk assessment, taking into account methodologies developed under the auspices of three international organizations: the Codex Alimentarius Commission (Codex), the International Office of Epizootics (IOE), and the Secretariat of the International Plant Protection Convention (IPPC). These organizations help in moving the world toward a common risk assessment methodology and harmonized standards.

The final principle is that members should recognize that SPS risks do not necessarily coincide with political boundaries. Pest-free and disease-free areas within a country should be recognized if there is sufficient evidence to warrant. Therefore, import protocols should be based on a regional distinction in many cases, rather than a country distinction. This principle is important in establishing pest-free and disease-free zones from which exportation is allowed.

These principles, along with the enhanced dispute settlement procedures, should help GATT and its successor agency, the WTO, to ensure that SPS and other technical barriers are truly in place to protect health and safety. Another important part of the SPS agreement requires countries to provide advance notification for standard changes. There have been over 10,000 such notifications (as of October 2011) during the first sixteen years of the WTO's existence ([www.wto.org](http://www.wto.org)).

The risk assessment methodology for SPS measures suggested by GATT involves three steps: evaluating the likelihood of a disease or pest entering a country or determining the potential adverse effects on health of additives and contaminants (the scientific part of the process); determining the acceptable level of risk that can be tolerated (this is a choice that decision makers must justify because rarely is there zero chance of occurrence); and selecting and applying measures that would limit risk to acceptable levels (designing a procedure that is as trade-neutral as possible).

If two parties disagree on a particular technical barrier, the WTO dispute settlement procedure begins with initial consultations among the parties. If the initial talks do not solve the dispute, a party can request that a WTO dispute panel be formed. The panel will hear the case and rule on it. The losing party is obliged to implement the panel's recommendations and report how it has complied with the recommendations. This is a very standardized process, and the decisions of the panel have more status than under the GATT rules. The international organizations referenced earlier will provide technical expertise in the dispute settlement process.

These three international organizations -- Codex, IOE, and IPPC -- are well recognized and have a long history of issues on health and safety. Codex, established in 1963, is responsible for food additives, pesticide residues, contaminants, animal drugs, packaging, and food standards. It is a subsidiary of the Food and Agriculture Organization and the World Health Organization. Its 184 member countries cover 98% of the world's population with representatives from government regulatory agencies, the scientific community, and



the food industry (Dawson). It works with member countries to establish food standards to facilitate international trade.

The International Office of Epizootics (OIE), an international veterinary organization that was formed in 1924, is responsible for animal health issues. There are 178 countries represented in its membership, and the organization maintains a reporting network on animal diseases. The OIE is useful in establishing quarantine policies for livestock trade and determining the procedures to decide whether a region is disease-free (which is a big issue for foot-and-mouth disease).

The International Plant Protection Convention (IPPC), which was formed in 1951, is responsible for plant disease and plant health issues. It is another subsidiary of the Food and Agriculture Organization and it has representatives from 177 countries. Its objective is to protect the world's cultivated and natural plant resources from the spread and introduction of diseases and pests.

All of these international organizations are very active in developing approaches to manage risk and working with individual governments to recommend quality control programs. Codex has been active in working on hazard analysis critical control point (HACCP) and best management practices (BMPs) systems. Their involvement ensures that no country can dominate discussions on technical barriers and that science plays the key role in decisions.

Another important international organization that is important for the food industry is the International Standards Organization (ISO), located in Geneva, Switzerland. Its ISO 9000 program is a voluntary quality assurance system to certify that the best practices are being followed by firms. This internationally recognized standard helps importers know that the product has reached process criteria that are appropriate for the particular industry.

It would be nice if the world could agree on common standards, publish and abide by them, and allow firms to trade freely based on those agreed-upon standards. However, that is not exactly how the world works even among developed countries – but it is moving in that direction. The costs involved in establishing standards have increased greatly over the years and science is more able to provide precise product quality measurements. However, tastes and situations vary tremendously by country and there are pre-existing national laws that are in force. As product standards increase in the future (as a result of higher incomes and increased preference for food safety), countries with reliable food safety and animal and plant health systems will have an advantage over others.

## **Examples of Disputes over SPS Measures**

This section covers four SPS cases that highlight the difficulty in settling disputes between and among countries. Many times politics plays a more pronounced role than science. Yet, there are clear indications that over time the WTO mechanisms will allow science to prevail over politics, even for large, powerful countries.

## Mexican Avocados

Mexican avocados were banned from entering the U.S. between 1914 and 2001 because of a fear that their importation would lead to infestations of avocado seed weevils (moths and fruit flies) for American producers[12]. The Mexican avocado industry is concentrated in the southwestern part of the country, and the mountains of northern Mexico have blocked the weevil's northern movement. Mexican scientists claim that there are modern chemicals and cultural practices that can be used to quell the threat.

Mexico is the largest avocado exporter in the world, and wanted to reach the U.S. market for avocados during the 1980s. A study commissioned by the American Farm Bureau estimated that Mexican production costs were \$600-900 per acre compared to \$5,200 to \$5,700 per acre in California. Roberts and Orden found that wholesale prices in the U.S. were approximately double those in Mexico. Mexico was clearly a low-cost producer of avocados and their produce would flood into the U.S. if there were no technical and trade barriers.

The negotiations for a NAFTA prompted a new inquiry by the Animal Plant Health Inspection Service (APHIS) of the U.S. Department of Agriculture, which is the organization in charge of quarantine issues associated with international trade, into the import situation for Mexican avocados. APHIS assesses hazards and recommends rules that permit entry of imported products with minimal risk to U.S. agriculture. This review began in 1990 and resulted in a proposed rule by APHIS to allow importation of avocados from the Mexican state of Michoacán, which is in northern Mexico, into the Northeastern U.S. during the months of November through February. These months were chosen because the weather conditions minimized the risk of pest infestations. Field studies had detected no weevils in Michoacán. The APHIS ruling also established strict regulations for monitoring insect populations, harvesting, packing and shipping practices, and inspections.

The review period for the proposed regulation change and the public comment period were spiced with negative comments from the U.S. avocado industry. The U.S. industry argued that the field studies on insects in Michoacán were flawed and the U.S. should allow importation of Mexican avocados only if all regions of Mexico were deemed pest-free. The final proposed rules reflected numerous changes in the work plans that the Mexican authorities had devised for the production and importation process. In the final analysis, APHIS estimated that a seed or fruit fly outbreak might occur less than once every million years and a stem weevil outbreak once every 11,402 years.

It is interesting to note that other U.S. fruit growers were not sympathetic to the cause of the U.S. avocado industry. A pest infestation could cause severe damage to other U.S. fruit growers, but they did not object to allowing importation of Mexican avocados. They saw the entire strategy of the U.S. avocado industry as seeking protection to keep avocados out of the U.S., which harmed efforts to open Mexican fruit markets to increased competition. Roberts and Orden imply that there was tremendous pressure on APHIS to keep the import ban on Mexican avocados, despite a minimal risk of pest infestation.

The U.S. Department of Agriculture ultimately allowed nineteen Northeastern states and the District of Columbia to import avocados from Michoacán in 1997 during the four months (November through February). In 2001, approval was extended to an additional twelve states and the import period was expanded to six months. Liberalization continued over time, as all states except California, Florida and Hawaii were allowed to import in 2004 and finally all states were allowed to import in 2007. There are still compliance rules for Mexican growers who ship avocados to the U.S. They include field surveys for pests, trapping, sanitation requirements, post-harvest safeguards, packing house inspections, and arrival inspections (Peterson and Orden). Some of these rules are aimed specifically at fruit flies, while others are more basic precautions. Mexico exported 267,000 metric tons of avocados to the U.S. in 2010.

Peterson and Orden performed an analysis of the effects of eliminating the fruit fly rules for Mexican avocados. They included four scenarios for the base year of 2005/06 (in that year the U.S. imported 114,000 metric tons from Mexico and 57,000 metric tons from Chile; while California produced 253,000 metric tons). Each scenario incorporated the costs of compliance and the estimated probability for a pest outbreak. The first scenario was with the 2001 rules that restricted which states could import and limited the time of year; the second scenario used the 2004 rules; the third scenario eliminated all rules pertaining to fruit flies (since even U.S. authorities admit that avocados are an unlikely host for fruit flies); and the last scenario eliminated all compliance requirements on Mexican producers.

They found that allowing avocados to be imported by almost all states and throughout the year increased U.S. total welfare by \$77.5 million under average risk conditions. In this result California growers lost \$76.3 million in producer surplus (California output would fall by over 2,000 metric tons), Chilean growers lost \$16.8 million in producer surplus (imports from Chile fell by over 6,800 metric tons), and

Mexican growers gained \$5.1 million in producer surplus (imports from Mexico increased by 91,000 metric tons). The main gainers were U.S. consumers who increased avocado consumption due to lower prices; they gained \$153.7 million. Interestingly the authors did not argue for a total elimination of SPS protocols for avocados. They estimated that the gains from eliminating the fruit fly regulations were modest, but abandoning the entire protocol “would be a questionable decision on pest-risk and economic criteria” (p. 334).

## Nursery Imports

Romano and Orden provide another case where the U.S. industry has put pressure on the U.S. Department of Agriculture, specifically APHIS, to keep import restrictions that are not justified by scientific evidence. The nursery case has been ongoing since the early 1970s and it is illustrative of the long time delays and meticulous negotiations that often accompany procedures to reduce technical barriers.

The importation of most nursery stock, plants, roots, bulbs, and other plant products is only allowed in bare root condition because the attached soil can carry undesirable pathogens. Shipping plants on a bare root basis is very costly because of high mortality rates. In 1974, the Netherlands Inspection Service reached an agreement with APHIS that allowed five plant genera to enter the U.S. in soilless growing media, including unused peat moss and vermiculite. These shipments were allowed on a five-year trial basis under the stipulation that strict phytosanitary procedures be followed. There was little at stake for the U.S. nursery industry because the value of imports was quite small for these five items. No disease outbreak occurred during the five-year trial period, so APHIS ruled that importation of these genera could occur with the specified growing media.

Between 1980 and 1983, APHIS received requests to allow importation of an additional sixty genera in the same growing media. Because of the comments and pressure from the nursery industry (probably related to the economic significance of these genera), APHIS stopped the regulatory process during the middle 1980s. Ultimately, APHIS decided to perform the risk assessments (the major part of the regulatory process) on five products at a time, in the hope that this would defuse some of the controversy associated with the economic impacts. Throughout the process there has been a struggle between APHIS scientists, who focused on minimal risk strategies (which is consistent with the GATT), and the industry, who wanted a zero risk strategy (obtainable only through an import ban). To date, only ten of the sixty requests have been approved.

Romano and Orden argue that this is another instance where interest groups have exerted strong pressure on the regulating agency to use SPS measures as a means to discourage international trade. There is no scientific evidence that gives credence to the U.S. nursery industry's viewpoint. These types of disputes involving risk assessments are very detrimental to the trade liberalization process and make it impossible to arrive at a consensus among the disputing parties. Both sides can agree on the probability of an outbreak, but if one side demands a minimal risk and the other side demands no risk, there is no room for imports.

## Beef Treated with Growth Hormones

The European Union's (at the time it was called the European Community's) Council of Ministers adopted a ban on the use of growth-promoting hormones in domestic cattle in 1985 and banned imports of cattle and beef that had been treated with growth hormones in 1988. Much of the stimulus for this ban on growth hormones came from E.U. consumers, who had experienced a number of food safety scares dating back to a scandal in Italy where the illegal growth promotant DES was found in baby food. Europeans have been skeptical of growth hormones since that time.

The U.S. viewed the hormone ban as simply a protectionist measure to keep U.S. beef out of the E.U. The ban occurred at a time when there was tremendous pressure on the E.U. to reduce agricultural expenditures. The E.U. had huge surpluses of beef and other animal products, so the U.S. felt that the Europeans were only trying to keep U.S. beef out of the market to reduce their surplus beef stocks.

The U.S. tried to use the TBT agreement from the Tokyo Round to attack the hormone ban in 1986 (before the import ban), but the TBT agreement only dealt with end-product characteristics. One cannot tell whether beef has been treated with a growth-promoting hormone because such hormones occur naturally in beef. The hormone ban involved restrictions on a specific production method, so the U.S. tried unilateral negotiations for a number of years, but they did not work. At the same time a Codex Commission decided that there is no need to place a maximum residual limit on natural hormones (the type used in the U.S. during the cattle production process).

Finally, the U.S. and Canada began the WTO dispute settlement procedure with the E.U. in 1996. A panel was formed and arguments were heard from both sides. The E.U. stated that its regulations on hormone use were a precautionary stance because one never knows what the ultimate risks will be. It argued that it had a right to impose a higher standard to support the concerns of its citizens.

The U.S. countered with a challenge that there was no scientific evidence that growth-promoting hormones cause health problems. The existence of hormones in food is not related to health, since one egg has over 75 times the amount of hormones in one kilo of beef. One cannot simply argue that banning hormone use is a higher standard without supporting evidence. Further, the E.U. allows similar hormones in other situations (such as carbadox in swine production), so there was significant evidence that the ban was a protectionist scheme.

The WTO panel rendered its decision in 1997 and sided with the U.S. and Canada. It said that there was no proof that disallowing hormone-treated beef was indeed a higher standard. Simply forcing domestic producers to follow those procedures did not mean it was a higher standard. The panel suggested that the E.U. develop a labeling program that would identify hormone-treated beef, so if consumers wanted such beef, they could readily purchase it.

The E.U. notified the WTO that it wanted to appeal the panel's decision, but the Appellate Body also ruled in favor of the U.S. and Canada. After the decision was adopted by the WTO Dispute Settlement Body, the E.U. said that it will abide by the decision in "a reasonable time." An arbitrator decides that a reasonable time was 15 months, so the E.U. had until May 1999 to comply with the WTO ruling. The E.U. did not abide by the WTO decision so the U.S. was allowed to withdraw access for \$117 million in E.U. good each year.

## Genetically Modified Organisms

The beef-hormone issue is indicative of a much larger fear in Europe concerning modification of agricultural products. There have been cases where European scientists have insisted that production processes were safe, only to discover later that they were not. The most controversial example of this is the problems with Bovine Spongiform Encephalopathy (BSE), or mad cow disease. British scientists had stated that the feeding practices of farmers were safe and would not affect people consuming British beef. However, when it was discovered that mad cow disease could be transmitted to humans consuming the beef, European consumers wondered what scientific revelations would come for other food products.

The focal point of disagreement between the U.S. and E.U. for crops concerns the use of genetically modified organisms (GMOs). Many crops in the U.S. emanate from genetically modified seed stock, and some countries, including many European countries, want these GMOs separated from natural products and labeled as GMO. This separation of product would be nearly impossible within the current grain marketing system, which means that grain sellers cannot guarantee that a shipment is GMO-free. The U.S. shipped \$1.1 billion of soybeans to the E.U. in 2010 and almost all of those soybeans were genetically modified.

There was an informal agreement to disregard policies and import barriers that discriminated against GMOs until the late 1990s. In 1999, the EU Council of Ministers voted to cease approval for GMOs until a more stringent approval process was adopted. The EU was hoping that a separate environmental agreement on biotechnology would provide the vehicle for handling differences in GMO policies and regulations among countries. A biosafety protocol agreement under the 1992 Convention on Biological Diversity was reached and signed in 2000. Under that agreement an importer could make unchallenged use of the precautionary principle to limit imports. No major GMO-producing country signed the biosafety protocol, so it did not provide a mechanism to resolve the differences in opinions between the EU and countries promoting GMO use.

Argentina, Canada, and the U.S. filed disputes about the EU approval process with the WTO in 2003. In late 2003, the EU instituted a revised approval regime which the litigants still felt was overly restrictive, so the dispute continued through the WTO process. In 2006, a WTO panel agreed with the complainants. In 2008, the U.S. asked the WTO for permission to suspend concessions for the EU (i.e., to increase tariffs on some EU products), but the U.S. has agreed to delay the arbitration as it negotiates with the EU.

The EU is in a very difficult political situation with this WTO ruling because the issue is such a lightning rod for criticism. Europeans are against GMOs for a number of reasons – food safety, environment, ethics and control of the food system. Some people feel that genetic manipulation might be a food safety risk. There is no scientific evidence that this might be true, but they wonder what future research will find. It is better to take approval of such food cautiously (the precautionary principle). Some people feel that widespread use of GMOs will harm the environment and reduce biodiversity. A number of people believe that it is unethical to manipulate foods in ways that cannot be achieved through natural processes. Some Europeans believe that GMOs give large multinational firms (mostly from the US) too much control over the food system.

Isaac (2007) argues that many Europeans simply have a different view of science. He feels that the US view of science (what he calls scientific rationality) is that it generates technologies that enhance efficiency and lead to economic development and growth. Market access should be allowed based on scientific justification. Regulations might be necessary to make sure that these technologies are safe and environmentally friendly, but they should be allowed. In contrast, Europeans have a social rationality approach that views technology as one facet of economic development. Science and technology should be balanced with precaution if there are speculative risks and data collection is not complete. In this case, science is one factor that must be weighed with other factors. In the social rationality approach, science can deny approval but it cannot secure approval (much like in statistics, one can refute a hypothesis but cannot prove one). The regulation of biotechnology is good example where these views clash.

The Europeans are not alone in their concern over GMO products. Many African and Latin American nations are in favor of labeling programs for GMO products. However, most grain exporting nations -- including Argentina, Australia, Canada, and the U.S. -- are vehemently opposed to labeling. There is no scientific evidence that GMO products cause harm to consumers, though a recent British study, which has been judged as non-scientific, found that genetically modified potatoes caused stunted growth and suppressed immunity in laboratory rats.

Labeling proponents argue that one never knows whether future research will find GMO products as harmful. There is a history of this in Europe, so why not label the products and allow consumers to choose? This isn't any different than labeling meats as kosher/halal or tuna as dolphin-friendly – the labeling provides

information to the consumer. A survey of European consumers found that 86% support labeling of GMO products (The Economist). Yet, producers are concerned that non-scientific consumer concerns will keep them from reaping the benefits of GMO products and force them to identify their products for many markets (increasing their costs tremendously).



## **Future Challenges for the WTO**

There has been great progress in dismantling some SPS barriers in recent years. There have been thirty-seven formal complaints that have mentioned the WTO SPS agreement ([www.wto.org](http://www.wto.org)). These complaints range from inspection procedures to country of origin labeling; many involve sanitary requirements for meat. There will be more work on disputes on a host of issues as food and safety standards change over time.

Progress is slow on disputes because these technical requirements must be addressed on a case-by-case basis with much effort going into the risk assessment methods. As methodologies become standardized and countries become convinced that WTO dispute settlement procedures work, there will be more unilateral or bilateral resolution of disputes, resulting in fewer technical barriers to trade. Yet, there will be a bias towards disputes involving developed countries because they have the resources necessary to follow WTO dispute settlement procedures. Either the U.S. or E.U. has been involved in most dispute cases because they have the staff and expertise to pursue these lengthy, complicated processes. Less developed countries often do not have the expertise and time to pursue their rights through WTO processes.

## Measuring Trade Barriers

As this and previous chapters have shown, there are a host of different methods for countries to break the link between their domestic market and the world market. The break can result from a tariff, quota, variable levy, or technical requirements. Often there are numerous policies, particularly with technical requirements, that impact the linkage between the domestic market and the world market for a particular product. It is essential to measure the protection that these trade barriers afford, so that trade negotiators can understand what barriers should be negotiated away and liberalization progress can be measured as barriers are lifted.

This section covers three common measures of trade barriers used for monitoring trade liberalization: the nominal rate of protection, the effective rate of protection, and the producer (and consumer) subsidy equivalent. The aggregate measure of support, the tool used to monitor protection in the WTO, is discussed in chapter 7.

### Nominal Rate of Protection

It is possible that one could quantify the protection that each trade barrier affords by investigating the effect that the barrier has on the difference between the world price and the domestic price. A \$1 per unit tariff would generate a \$1 difference between the world price and the domestic price. However, this only works with barriers that have prescribed price effects, such as tariffs. As previous chapters have shown, the domestic price effects of a quota will depend on supply and demand conditions within the country. Measuring the price effects of technical requirements and other restrictions that are not price-based is virtually impossible.

For this reason, economists tend to look at the difference between domestic prices and world prices (or the price wedge) to determine the combined effects of all trade barriers for a particular product. One must be careful that the two prices are comparable (at the same time, level within the marketing system and geographic location) so that the price difference reflects only the barriers to trade (a border price compared with an internal wholesale price at the port). Thus, the difference between the domestic price,  $P_d$ , and the world price,  $P_w$ , is the implied trade barrier,  $T$  [13].

$$T = P_d - P_w \quad (5.1)$$

For example if the product in question is peanut butter, the world price might be \$1.50 per pound, while the domestic price might be \$2.00 per pound, making the implied trade barrier \$0.50 per pound.

#### *Discussion Box 5.1 Problems with Price Wedges in Measuring Trade Barriers: the Case of Japanese Apple Imports*

*Sometimes the difference between the domestic price and the import price (the price wedge) underestimates the effects of a trade barrier. An analysis by Calvin, Krissoff, and Foster analyzed Japanese apple import procedures (protocols) and found that the effects are more complex.*

*The U.S. government and the U.S. apple industry have had quite a few disputes with the Japanese over protocols for allowing apples into Japan. The Japanese have been very concerned with fire-blight, a bacterial disease, and codling moth. Part of the dispute was the Japanese claim that symptom-less fruit could still carry the disease (a hypothesis that has not been confirmed by scientific evidence).*

*In the mid-1990s, the Japanese required imported apples to be produced under a complex, strict protocol to reduce the spread of fire-blight and codling moths. Any imported apples had to be produced in a separated field with a surrounding buffer zone. The apples produced in the buffer zone could not be exported to Japan and the apples within the buffer zone had to be inspected three times during the growing season. Apples without fire-blight symptoms can be sold in the U.S. and most other countries without restrict, so apple growers only had to follow this protocol if they were exporting to Japan.*

*The Japanese apple market is typical of many Japanese produce markets – the prices are quite high, but the quality must be flawless. Apples can only sell in Japan if they are large and blemish-free, so U.S. growers faced a decision with significant risks if they were to attempt to sell in Japan. Calvin, Krissoff, and Foster performed an interesting economic analysis of the decision process for U.S. producers in selling to Japan. Producers need to pre-commit to the Japanese protocols before they are assured that their apples are not only fire-blight free, but also of sufficient quality for export to Japan. Calvin et al. argue that a simple price wedge (the difference between Japanese apple and US apple prices) was not sufficient to measure the*

*effects of the technical barriers because the apples were not homogenous and there were costs involved in following Japan-specific protocols.*

*In 1997, the US requested a modification of the fire-blight protocol for apples by arguing symptom-less fruit doesn't carry the disease. The WTO heard the case in 2002 and ruled in favor of the U.S., so Japan changed some of its protocol. However, the new protocol still deals with handling procedures concerning codling moths. This requires that apples be held in cold storage for at least 55 days and fumigated with Methyl-bromide (which not only costs money but also reduces their price in the Japanese market).*

*Calvin et al. built a model to see how often a U.S. producer would likely gain from following the procedures to meet Japanese requirements (rather than to sell in the U.S. or other markets that don't require the protocol). Their most likely situation was a 50% chance that the apple would be free from fire-blight and a 67% chance that the apple would meet Japanese quality standards. When one added the costs of transportation, tariff, and fumigation to the U.S. price of 50¢/lb., and included the expected 7.75% discount due to fumigation, the landed cost in Japan was \$1.11/lbs; just a bit above the baseline Japanese price of \$1.08. Of course all of these prices and costs vary from year to year so there is much risk involved. This analysis highlights the complex nature of technical barriers and how they shape decision-making by farmers and marketing firms.*

The *nominal rate of protection*, NRP, is the simplest percentage measure of trade barriers. It simply puts Equation (5.1) into percentage terms.

$$\text{NRP} = \text{T}/\text{P}_w \quad (5.2)$$

In the peanut butter case, the NRP would be 33% (0.50/1.50).

### Effective Rate of Protection

If one wishes to measure the degree that domestic producers of a product are protected, then consider that the value-added by the manufacturer is less than the product's price. Assuming that the price of the processed product is broken into the price of the raw material (input 1) and the composite of all other value-added activity (input 2, which would include land, labor, capital, etc.), then the following equation holds in perfect competition:

$$\text{P}_d = w_1 \text{P}_1 + w_2 \text{P}_2 \quad (5.3)$$

One can think of the  $w_i$ s as reflecting the number of units of input  $i$  needed to produce one unit of the processed good. The value-added of the processor is  $w_2 \text{P}_2$ , because  $w_1 \text{P}_1$  is a purchased input. The *effective rate of protection*, ERP, reflects only the protection afforded the value-added by the processor:

$$\text{ERP} = \text{T}/(w_2 \text{P}_2) \quad (5.4)$$

or

$$\text{ERP} = (\text{P}_d - \text{P}_w)/(w_2 \text{P}_2) \quad (5.5)$$

Note that ERP will normally be greater than or equal to NRP; the lower the value-added in the process, the higher the effective rate of protection. In the peanut butter case, if one assumes that peanuts are the only raw ingredient in peanut butter and those peanuts make up 50% of the domestic cost, the ERP for peanut butter would be 50% (0.50/1.00). If the costs of peanuts make up only 10% of the cost, the ERP would be 27.8% (0.50/1.80), which is lower than the NRP because the value-added is quite high for peanut butter manufacturers.

To further complicate things (but closer to reality), assume that the processed product uses an ingredient whose domestic price is above the world price (i.e., there is an implied trade barrier on the ingredient). The protection afforded domestic producers of the processed product is lower because they must pay a higher price for their input.

The price of the processed product without trade barriers on either the product itself or the ingredient is reflected in Equation (5.3) if  $\text{P}_1$  reflects the world price for the ingredient. However, because of trade barriers on input 1 (the domestic price for the input is  $\text{P}_1^*$ ), the domestic price of the processed product under perfect competition with all trade barriers,  $\text{P}_d^*$ , is:

$$\text{P}_d^* = w_1 \text{P}_1^* + w_2 \text{P}_2 \quad (5.6)$$

The difference between what the domestic price of the processed product is,  $P_d^*$ , and what it should be under free trade,  $P_d$ , has two elements -- an implied trade barrier on the processed product,  $T^*$ , and an implied trade barrier on input 1,  $w_1 (P_1^* - P_1)$ . The implied trade barrier on the processed product can be found from the following equation:

$$P_d - P_w = w_1 (P_1^* - P_1) + T^* \quad (5.7)$$

or

$$T^* = P_d - P_w - w_1 (P_1^* - P_1) \quad (5.8)$$

In this case, the implied trade barrier,  $T^*$ , is less than the difference between the domestic price and world price for the processed product because the processor has purchased inputs at above the world price [14]. The formula for calculating the ERP is still Equation (5.4), but with  $T^*$  instead of  $T$ .

In the peanut butter example, if the domestic price of peanuts was double the world price, so that the world price of peanuts in one pound of peanut butter was only \$0.50, then the effective rate of protection on peanut butter would be zero. The peanut processor is paying \$0.50 extra for the peanuts in each pound of peanut butter and the domestic peanut butter price is \$0.50 above the world price. In this example, the trade barrier on peanut butter has fully compensated the peanut butter producer for the higher price of domestic peanuts.

### Producer and Consumer Subsidy Equivalents

Nominal and effective rates of protection are good measures of protection on an individual product basis. However, they are not perfect, particularly for agricultural products, because of the important role of government subsidies. Some of these subsidies come in the form of direct payments to producers, which are easy to include in an NRP or ERP formula, but many areas of government support are not directed at a particular commodity or are difficult to document in terms of a difference between a domestic price and a world price. *Producer subsidy equivalents* (PSEs) were developed to overcome some of the problems with NRPs and ERPs.

The PSE measures the effects of government policy on gross farm income, or the lump sum payment that governments would need to pay farmers to keep their income unchanged if government policies terminated (Ballenger). PSEs include direct government payments (or subsidies) plus the costs of government expenditures related to the commodity. PSEs are normally calculated by the following general formula:

$$PSE = (P_d - P_w) Q + GE \quad (5.9)$$

The PSE can also be shown as a percentage of farm receipts or on a per ton basis.

The term  $P_d - P_w$  is the price wedge between domestic prices and international prices,  $Q$  is the amount of production, and  $GE$  includes government expenditures that also support producers of the product, including general and product-specific expenditures. When PSE is divided by gross farm income, it is a percentage of gross farm income that is attributed to government policy.

Government expenditures that are not associated with particular commodities (such as farm credit subsidies, transportation subsidies, and government expenditures on research and extension) are normally assigned to commodities in their proportion of farm income (e.g., if corn accounts for 10% of farm income, 10% of the general government expenditures are included in PSE calculations for corn).

Table 5.1 shows PSE calculations for corn in the U.S. for 1986, the year where the PSE as a percentage of corn producer income was at a maximum and 1993, a more normal year. For 1986, direct payments to corn producers totaled \$8.0 billion and indirect transfers totaled \$1.8 billion. These benefits to corn producers accounted for 47.7% of their total income. The PSE for 1993 was much lower because direct payments to corn producers were \$1.5 billion and indirect transfers were \$0.9 billion. These benefits to corn producers accounted for 13.9% of their total income. There was no difference between the U.S. corn price and the world corn price, so the price wedge was zero for both years.

**Table 5.1 Calculation of PSEs for U.S. Corn, 1987 and 1993.**

	1987		1993
	In Million \$		
Direct Payments to Producers			
Crop insurance	(17)		0
Deficiency payments	6,196		1,526
Disaster payments	0		0
Diversion payments	133		0
Loan forfeit benefits	1,333		0
Storage payments	359		0
Total Direct Payments	8,004		1,526
Indirect Transfers			
Commodity loans	879		0
Farm credit	208		135
Pest and disease control	27		43
Advisory	33		39
Inspection	5		7
Processing and marketing	13		17
Land improvements	150		201
Research	84		128
State programs	200		249
Taxation	132		53
Transport	57		122
Total Indirect Transfers	1,788		994
Total Direct Payments and Indirect Transfers (PSE)	9,792		2,520
Value of Production	12,507		16,597
		Direct Payments	8,004
		1,526	
Total Income	20,511		18,123
		PSE as percent of income	47.7%
			13.9%

Source: Economic Research Service, U.S. Department of Agriculture  
<http://www.econ.ag.gov/Prodsrvs/dp-ti.htm#subsidy>

One benefit of the PSE is that it is readily comparable between countries because it includes the scale of production and involves a dollar amount. Further, one can easily aggregate PSEs for commodities to obtain a PSE for the entire agricultural industry of a country. This is impossible to do with NRPs or ERPs without tremendous weighting problems by product. So, PSEs provide a simplified yardstick to measure one country or commodity against another.

PSEs are also convenient ways of turning every barrier and government expenditure into a subsidy equivalent. Pure NRPs and ERPs do not consider whether domestic production is great or small, so an NRP of 10% on beef (a major import item for the U.S.) has the same presumed impact as an NRP of 10% on corn (a product where U.S. imports are virtually zero). The subsidy equivalent of the 10% NRP on beef will far exceed the subsidy equivalent of the 10% NRP on corn for the U.S. When multilateral negotiations are taking place, it is far easier to deal with PSEs than with other measures of protection. Also, when the negotiations are finished, dealing with PSEs makes it easier for countries to arrive at liberalization targets: it doesn't matter what combination of policies is changed, only that the PSEs fall by a certain percentage.

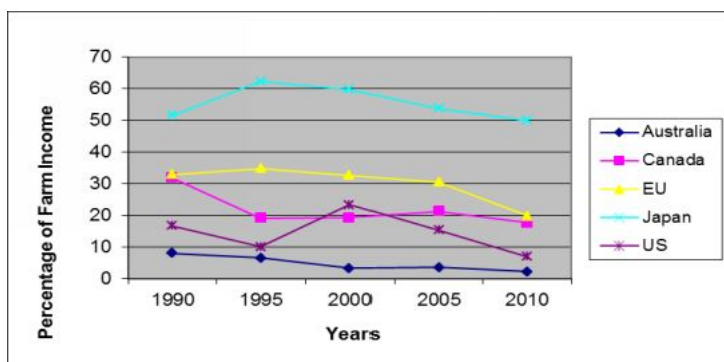
Finally, the PSE serves as a convenient monitoring device because it is relatively easy to calculate (though time-consuming). Table 5.2 shows aggregate and percentage PSEs for selected countries for 2011 collected from the Organization for Economic Cooperation and Development). China and the European Union have the largest aggregate PSEs (\$147.0 and \$101.4 billion, respectively), but their percentages are relatively low (17.4% and 19.8%, respectively). The countries with the highest percentage PSEs are Norway (60.4%), Switzerland (53.9%), Japan (50.0%), and Korea (44.6%). The PSE for New Zealand is essentially zero. The U.S. aggregate PSE is \$19.5 billion or 7.0% of farm income.

**Table 5.2 Producer Subsidy Equivalents, Aggregates and Percentages, for Selected Countries, 2011**

	<u>Aggregate</u> In billion \$s	<u>Percentages</u>
Australia	\$ 1.0	2.2%
Brazil	\$ 7.1	4.5%
Canada	\$ 7.4	17.7%
China	\$ 147.0	17.4%
European Union	\$ 101.4	19.8%
Japan	\$ 52.9	50.0%
Korea	\$ 17.4	44.6%
New Zealand	\$ 0.5	--
Norway	\$ 3.6	60.4%
Switzerland	\$ 5.4	53.9%
United States	\$ 19.5	7.0%

Figure 5.1 shows how percentage PSEs have varied over time for five countries, Australia, Canada, the E.U., Japan, and the U.S. These percentages increase as world prices fall (and vice versa), but they are generally falling for all countries. The downward trend is less pronounced for Japan, though. If world commodity prices continue to rise, PSEs will continue to fall.

**Figure 5.1 PSEs by Country, 1990-2-10**

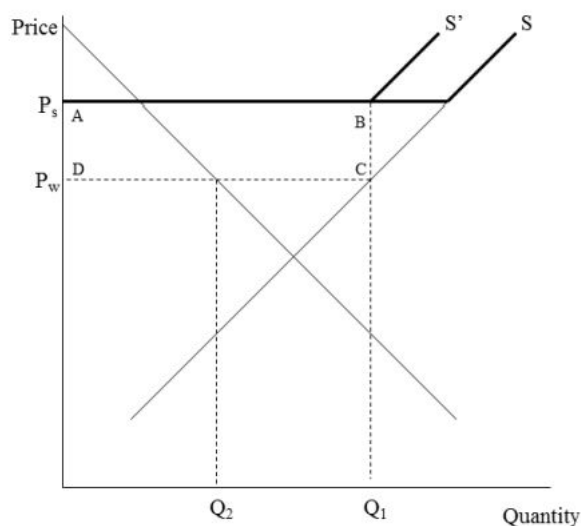


Despite their ease of use and encompassing definition to include all government transfers, PSEs have their problems with respect to trade liberalization. They do not indicate the impact of government policies on world markets. Specifically, PSEs do not measure the degree that international trade has been distorted, and elimination of this distortion is the main topic of multilateral trade negotiations. Two countries can have identical PSEs for a commodity, but one country’s policies might have no impact on trade, while the other’s policies might have tremendous impacts.

Consider a case where an exporting country guarantees the price of the product above the world price, as depicted in Figure 5.2. With no government policies and free trade, the country should allow its domestic price to equal the world price,  $P_w$ , and exports would be  $Q_1$  minus  $Q_2$  (production minus consumption).

Assume that the country instead wants a guaranteed producer price of  $P_s$  through a deficiency payment that would make up the difference between  $P_s$  and the market price (which would be  $P_w$  since the country is an exporter). However, producers are only allowed to receive the price guarantee if they set-aside acreage (and assume that percentage is enough to shift the effective supply curve from  $S$  to  $S'$ ).

**Figure 5.2 Combination of Policies with No Net-Effect on Exports**



The PSE for the country would be the area  $ABCD$ , but this combination of policies would have no effect on the country’s exports, and therefore no effect on the rest of the world. Other countries shouldn’t care about this combination of policies because it does not affect world price, consumption, or production. One can contrast this with a pure export subsidy system generating an identical PSE, which would increase the exporting country’s exports and therefore generate trade distortions that would cause the rest of the world to

change their production and consumption patterns. Thus, one must be careful in inferring that PSEs always reflect trade distortions.

In the Uruguay Round GATT negotiations, the final negotiated outcome by country involved aggregate protection in agriculture and protection for individual commodities. The PSEs were not used in the final agreement (as will be explained in Chapter 7). The Aggregate Measure of Support (AMS), which deals more with clearly trade distorting policies, was used.

Calculations of PSEs have problems that they share with other measures of protection. Because world prices and domestic prices are often denominated in different currencies, one must choose what exchange rate to use. This choice can be a problem if exchange controls exist (restrictions on who can exchange currency or uses of the currency) or if there are multiple exchange rates depending on the transaction. Both of these instances occur in some less developed countries. Further, recent volatility in exchange rates and world commodity prices can change the calculations drastically over time. Averaging exchange rates and commodity prices over time may reduce the variability of these calculations

Despite problems with measuring trade barriers, there is a huge demand for aggregate measures that can be used for negotiations and monitoring progress in trade liberalization. It is important that work continue to refine these measures and overcome some of the conceptual weaknesses, while keeping them relatively simple for policy formation.

Finally, *consumer subsidy equivalents* (CSEs) are comparable to PSEs, but they measure the value of government subsidies to consumers and are often denoted as a percentage of consumer expenditures. CSEs also have two components: the price wedge between the world price and the domestic price (CSEs are negative if the domestic price is above the world price), and government expenditures that benefit consumers of the commodity. They are typically small for most countries, but can be large positive numbers for some less developed countries.



## Summary

1. Technical standards are rules for quality, packaging, labeling, standards of identity, and conformity assessment. Some of these regulations help increase the information flow in the marketing process and allow consumers to be informed of product origin, safety, and quality. Other technical regulations or barriers include sanitary and phytosanitary (SPS) regulations on plants and animals that assure that traded products are not infected with harmful pests or diseases.
2. Many people are concerned that technical barriers are purely means of protection for domestic producers. This is especially true now when traditional trade barriers have fallen due to GATT negotiations, but countries are increasing their technical barriers.
3. The Uruguay Round's SPS agreement had the following basic principles: countries have the right to institute measures that protect plant, animal, and human health if they are based on scientific principles; countries should base their SPS requirements on international standards, guidelines, or recommendations; countries should recognize measures adopted by other countries if they provide equivalent protection; SPS measures should be based on a risk assessment; and countries should recognize the SPS risks do not necessarily coincide with political boundaries.
4. The Mexican avocado, nursery import, beef-hormone, and GMO cases show how difficult it is to make trade more open through reducing technical barriers. There are numerous ways to slow the liberalization process, particularly if the money involved is substantial.
5. Four measures of trade barriers are the nominal rate of protection, the effective rate of protection, the producer subsidy equivalent, and the consumer subsidy equivalent. The first two deal with differences between domestic prices and world prices, whereas the later two also incorporate government expenditures into the calculations.

## Questions

1. How do you feel about the U.S. harmonizing its food and safety standards to those of an international scientific organization?
2. How would you feel about the Mexican avocado case if you were an avocado producer?
3. Technical barriers to trade are becoming increasingly contentious issues in agricultural trade. How do you think WTO philosophies and dispute settlement affect the implementation of technical barriers?
4. Why were PSEs useful in GATT negotiations? What is used in today's WTO negotiations?
5. Should products derived from GMOs be labeled as such? Why?

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## Chapter 6

## Multilateral Trade Negotiations: The GATT and WTO

After World War II, the Allies made great efforts to make sure that all countries of the world had forums where they could meet, discuss issues, and decide on the best course for the world to move forward. The most important and encompassing organization formed was the United Nations, which is mostly for political matters and international relations. The idea was that if nations continually communicated in an open forum, it was less likely that conflicts would come about.

Numerous multilateral organizations were formed to assure that the world trading system operated smoothly, because many believed that economic matters were a major cause of Germany's belligerent behavior during the 1930s (the high war reparations and resulting inflation allowed German fringe parties to be successful). Van de Bossche argues that international trade rules were needed to restrain nations from themselves, to provide security, stability, and predictability, and to cope with globalization challenges.

This chapter covers the major multilateral organizations charged with promoting freer trade among nations, the General Agreement on Tariffs and Trade (GATT) and the World Trade Organization (WTO)[\[15\]](#). The guiding principle behind the GATT and WTO is that trade benefits all countries, as seen in Chapter 2. Yet people realize that domestic issues often encourage countries to follow more restrictive trade policies. The GATT is structured to overcome those domestic arguments for trade barriers through multilateral negotiations involving tariff and trade barrier reductions among all GATT member nations. Through this mechanism, trade barriers have fallen drastically in most products and world trade has soared, resulting in vastly improved welfare for all countries.

## GATT History and Guidelines

The GATT was established after World War II (in 1947), along with the United Nations, International Monetary Fund, and International Bank for Reconstruction and Development (World Bank). Originally an International Trade Organization (ITO) was proposed along with GATT; the GATT dealing with multilateral trade negotiations and the ITO dealing with other international trade issues (GATT being within the ITO). However, the negotiations for the ITO were delayed, so GATT was established before the ITO. The negotiations for the ITO charter were completed in 1948, but the US Congress never approved entry; rendering the ITO useless. The GATT became the de facto international trade organization for many years, transforming itself from an agreement into an organization.

There were twenty-three original GATT members. Until 1994, when the Uruguay Round ended and the World Trade Organization (WTO) was established (on January 1, 1995), the GATT was the only multilateral organization with established rules for international trade policies. The GATT had member nations (117 in 1993) that pledged to follow the principles of reduced trade barriers and other trade distortions. The members at that time included all major trading countries except China and the former Soviet Union. The GATT, and now the WTO, is mostly a negotiating club with specific rules for conduct and dispute settlement.

Voting wasn't originally a part of the GATT charter, so all decisions are by consensus. This has caused problems, especially as the membership has grown; decision-making can be very time-consuming. The GATT has always had to balance inclusiveness with efficiency in their processes. Some outside observers charge that the decisions are not transparent and it is dominated by behind doors bargaining and not open discussion of issues. Bluestein argues that the WTO is democratic and consensual, but it also must deal with draft statements (to increase efficiency and move the process forward) and policies that are quite complex. These statements are drafted with the needs of the major countries in mind. Yet ultimately all members must agree (or at least agree not to disagree) to a particular decision.

The GATT rules and principles are only as good as the pledges and promises of the member nations. There is no international government or police force to uphold the GATT rules and agreements. National sovereignty is always an issue because multilateral rules can have uncomfortable impacts on member nations. Thus the GATT works only as well as the member nations make it work through their own self-interest in lowering trade barriers to promote and increase world trade. There is no question, though, that the GATT rules and principles make it easier for member governments to make changes to open their economies.

There are many complex and specialized GATT rules, but they basically cover market access and transparency, definitions of unfair trade, procedures for resolving conflicts between trade liberalization and societal values, special and differential treatment for less developed countries, and institutions and procedures for decision-making and dispute settlement.

The GATT is guided by a number of principles that members agree to uphold. These include:

**Reciprocity:** A country comes to the bargaining table with offers to reduce trade barriers with the expectation that other countries will do the same.

**Non-discrimination:** Countries are to give all GATT members the same preferences. This is often called the Most Favored Nation principle.

**Transparency:** Trade barriers should be easily recognized by others, not disguised.

**National treatment:** Goods should receive the same treatment within a country, no matter what their country of origin.

**Compensation:** Countries harmed by changes in policies of another country are entitled to compensation.

The manner in which these principles were followed during the GATT's history had its ups and downs; depending on how committed the governments were to GATT's goals. Nonetheless, there has been tremendous liberalization in merchandise trade since 1947, and certainly the GATT is a major reason for this occurrence. This is because the GATT has concentrated its efforts on market access – reducing tariff and non-tariff barriers to trade.

## Market Access

The basic principles on market access are reciprocity and Most Favored Nation (MFN). If you (as a country) request an increase in market access, you should be prepared to improve market access for others. Furthermore, if you make a concession for one GATT member, you should make it for all. There are exceptions to MFN through the United States' Generalized System of Preferences which provides special access (reduced tariffs) for less developed countries or former colonies. The Everything But Arms program of the E.U. gives duty-free access for some LDCs in all products except arms.

In the early years of GATT (before the Tokyo Round), negotiations on market access were performed on a product-by-product basis; each member put together a request list and the negotiations were among suppliers and importers of the product. A linear approach was introduced in the Tokyo Round where the aim was to reduce tariffs across the board by a certain percentage (though some products were excluded or had different reduction commitments). Now negotiations tend to take place on a formula (non-linear) approach that results in high tariffs being reduced more than low tariffs.

The Most Favored Nation (MFN) principle assures equality of opportunity for all members. Members can grant no advantages for like products in terms of tariffs, internal taxes, and internal regulations (Van den Bossche). National treatment makes sure that internal policies do not negate reduced trade barriers from GATT negotiations. The legal term is that imported product receive a treatment that is "no less favorable" than national products. National treatment does not hold for government procurement and domestic subsidies (though there is an Agreement on Government Procurement that some nations have signed). All GATT member countries pledge themselves to these principles and the overall goal of freer trade. Countries must convince the GATT, and now the WTO, of their commitment before membership is accepted. China joined the WTO in 2001 and had a very difficult time in its negotiation process. The Russian Federation finally was admitted in 2012 after many years of negotiations; some members are still not convinced that the Russian Federation is fully committed to WTO principles.

## Unfair Trade Practices

The two most common unfair trade practices are subsidies and dumping. Subsidies are a common policy used by governments to pursue legitimate domestic economic and social goals. However, these subsidies can adversely affect trading partners because they can distort production and consumption; therefore impacting trade. Dumping is bringing a product into a country at less than its “normal value.” This practice is not illegal, but countries can take actions against it (e.g., anti-dumping duties).

It is a challenge to have a procedure to determine which subsidies are harming other countries and developing a means for resolving subsidy disputes. The initial WTO Agreement has the Agreement on Subsidies and Countervailing Measures (SCM Agreement). The SCM Agreement defines subsidies as a financial contribution by a government or public body that benefits a company or industry. Some subsidies are specifically prohibited – export subsidies and import substitution subsidies (which are contingent on using domestic goods over foreign goods). Other domestic subsidies are “actionable” in the sense that they can be challenged by another country claiming that they cause injury to their constituents. The challenging country must show that a subsidy exists; that injury has taken place; and that the injury is caused by the subsidy. Generally, the subsidy must be specific to a company or industry (though the U.S. Foreign Sales Corporation law, which gave tax preferences to certain corporate structures, was ruled an illegal subsidy). Claims of injury from subsidies are a legal process within WTO dispute settlement, though the timetable for the dispute may differ. If a subsidy is found to exist, a country can impose a countervailing duty (an import tariff that counteracts the subsidy). This duty cannot be more than the subsidy found and is based on the damages incurred.

The SCM rules do not apply fully to agricultural products. “Listed” agricultural products are exempt from SCM rules, but are subject to the member’s specific commitments under the Agriculture Agreement (they are listed in the Agriculture Agreement). Unlisted agricultural products are subject to the SCM Agreement. With the ending of the Peace Clause in 2004, all agricultural subsidies can be challenged under the SCM Agreement. The Agriculture Agreement prevails when the SCM and Agriculture Agreements conflict.

There is an Anti-Dumping Agreement that took effect in 1994, which deals with prices in exporting countries versus prices in importing countries. For anti-dumping provisions to be allowed, three things must be present: selling below normal value (dumping); injury to a domestic industry; and that injury must be caused by the dumping. Determining the normal sale price is often difficult because of product differentiation, exclusive sale agreements (when the product is only exported), and sales to affiliated companies. If exporting prices are not available, prices in third countries can be used to determine normal value. The difference between the export price and the normal value is the margin of dumping. Even this comparison is difficult because export price and normal value vary over time. Should the comparison be on a daily basis? A weighted average over time? Should lags be included?

Injury must take place in a “like” product from a domestic industry. The definition of the product is sometimes difficult, as is the definition of the industry. If one wants to find injury, then the definition of an industry will tend to be narrower and confined; whereas if one wants to argue that no injury has occurred, then one would define an industry more broadly. These types of arguments are wonderful for lawyers, but a headache for economists. Article 3.4 of the Anti-Dumping Agreement lists some of the factors within an industry that must be tracked to determine injury: actual or potential sales, profits, market share, return on investment, capacity utilization, domestic prices, the margin of dumping, cash flow, inventories, employment, wages, and growth. Note that a causal link must be found between the dumping and these factors.

Anti-dumping investigations are held by member nations based on these WTO rules. If a preliminary investigation finds that dumping has occurred there can be a provisional anti-dumping measure (a countervailing duty or a cash deposit equal to the estimated margin of dumping) for up to four months. If the final investigation finds that dumping has occurred there are two courses of action. The first is price undertakings – where the perpetrators agree to increase export prices or cease exports. The second is a countervailing duty. If export prices are increased, then there is no further action needed. However, if countervailing duties are imposed, the question becomes how long should those duties remain?

Remember that the firm found guilty of dumping does not feel that it has sold below normal value. If the countervailing duty prices the exporting firm out of the market, then the anti-dumping finding has turned into a highly protectionist measure (which is the conclusion of many economists). It might seem odd that the importing government would collude with the exporting firm to increase its export price to resolve the dispute, but this has happened. The main users of anti-dumping investigations are India (a country that has a long history of protection for its domestic industries) and the United States. The most common target is China.

## Dispute Settlement

The original GATT did not have means to resolve disputes because it existed to negotiate reduced trade barriers. In the early years there were only a few countries, so disputes were resolved through working parties that normally included diplomats with similar backgrounds and cultures (coming from more developed countries). Countries would try to work out difficulties themselves if a disagreement erupted, but sometimes they would take their dispute to the GATT. This approach broke down in the 1980s and 1990s as the membership increased, so the GATT began having a more rules-based system that involved panels. A GATT panel of experts would hear the arguments of both sides and render a verdict/report. However, if the offending party was found guilty, the system relied on the offending country to remedy the situation: the GATT did not force a policy change. The losing party could delay or disregard the proceedings in many ways, including vetoing the panel establishment and the panel's recommendation. If the offending country did not remedy the situation, the injured country was allowed to enact sanctions on the offending country in proportion to the estimated injury. Yet, a major problem was that in the end, the resolution of any dispute relied upon the voluntary action of the offending government. Furthermore, any party could delay the proceedings.



## Agriculture and the GATT

Trade negotiations under the GATT were generally handled through Rounds (occurring approximately every eight years) that concentrated on trade barriers and other problems in specific industries. This allowed countries to come with very specific proposals on liberalization for their economy, along with certain expectations for liberalization on the part of other countries. The preparation undertaken and effort expended were often great, but the push to end a Round, with the resulting liberalization, made the GATT Round format a success. Further, because countries had pledged never to retrench and enact higher trade barriers, each Round saw fewer factors inhibiting trade over time.

The one exception to this continual reduction in trade barriers through the GATT was agriculture (at the insistence of the U.S. in 1955). The U.S. Congress forced the GATT to allow waivers on policies that would conflict with U.S. agricultural policies. Other countries agreed because agriculture had always been viewed as a special case. Three exemptions of note were that export subsidies could be used on agricultural products as long as they didn't result in more than an "equitable share" of the market. A second exemption was in section 22, where countries were allowed to enact tariffs if imports were found to cause "domestic injury" for agricultural products covered by a domestic policy. The third exemption allowed suspension of GATT rules if needed to preserve health, safety conservation, and national security.

The nebulous nature of these exemptions and the continuing desire of countries to protect their agricultural sector (especially in Japan, Western Europe and the U.S.) effectively kept agricultural products out of the negotiation Rounds until 1986 when the Uruguay Round began. That year world agricultural prices were at their lowest level in many years and agricultural protections, measured by producer subsidy equivalents (PSEs), were at their peak. The beginnings of these protectionist policies trace back to the establishment of the united Western Europe in 1958 (the European Common Market at that time) and its Common Agricultural Policy (see Chapters 7 and 10). The emergence of the European Community as a major agricultural exporter during the latter 1970s and throughout the 1980s encouraged the U.S. to rethink its idea of keeping agriculture out of the GATT.

The challenges for agriculture came from high levels of internal support, export subsidies that allowed countries to dispose of accumulated surpluses, and high trade barriers to support domestic policies. The high internal supports (usually through guaranteed domestic prices) in many countries encouraged production and exports. This hurt producers in countries that did not subsidize their agriculture, or subsidized it at a relatively low level. Export subsidies were coupled with high internal support, particularly by the E.C., so that surpluses could be dumped on the world market.

Because agriculture was never fully included in a GATT Round, many agricultural tariffs were not "bound" for GATT purposes, so there were no hindrances for countries that wanted to increase their tariffs or other trade barriers. The European Community was allowed to adopt Common Agricultural Policy and withdraw all its previous tariff bindings by concessions that were given on non-agricultural products (Hudec). Thus, the variable levy of the E.C. was GATT-legal because agricultural products covered by the levies were not bound.

### *Explanation Box 6.1 Bound Tariffs*

*"Bound" tariffs are ones that have been included in the GATT process and essentially sanctioned at that rate. The tariff rate cannot increase from the bound level. Because E.C. tariffs had never been bound before the Uruguay Round agreement they could increase without GATT objection. Some African countries do not have tariff bounds either. Applied tariffs can be lower than bound tariffs; this is called "water" in the tariff. Trade negotiations deal with bound tariffs, so there can be negotiated changes in bound tariffs with no effects on trade if the applied tariff is lower.*

Domestic subsidies should have been a violation of national treatment, because domestic producers were receiving benefits in the country that were not allowed to foreign producers. This was never enforced through a GATT panel because there was not a pro-trade climate when many of these policies were instituted. Subsidies became so pervasive among the more developed countries that they were never challenged.

By the mid-1980s, the costs of agricultural programs in many countries had become burdensome and there was great pressure to lower government expenditures (particularly in the E.C. and the U.S.). The U.S. was also committed to liberalized agricultural trade, even though it followed many policies that artificially

encouraged production and exports while discouraging imports. American farmers, politicians, and the American public were convinced that the U.S. would gain much if world agricultural trade was liberalized. Thus, the Uruguay Round, the eighth and final GATT Round, began in September 1986 with agriculture as one of the specific areas for negotiations.

## Uruguay Round -- Timetable of Negotiations

The Uruguay Round of the GATT got its name from the location of the initial meeting in Punta del Este, Uruguay, in September 1986, where member nations committed themselves to "greater liberalization of trade in agriculture." Other important areas covered by the Uruguay Round were intellectual property, services, trade-related investment measures, and the dispute settlement procedures. These later areas have impacts on agriculture, but the heart of the Round had very specific impacts on agriculture.

Despite the general commitment to liberalize agricultural trade, there were many differences among the member nations on the way to do this and the extent of liberalization. Three important groups developed relative to the initial stages of the negotiations -- the United States, the European Community, and the Cairns Group. The latter group was made up of Australia, Argentina, Brazil, Canada, Chile, Colombia, Fiji, Hungary, Indonesia, Malaysia, New Zealand, the Philippines, Thailand, and Uruguay. The U.S. and the Cairns Group supported more open trade, while the E.C. was more cautious. Other important players, such as Japan and Korea, stayed mostly on the sidelines to watch the other groups, hoping that the negotiations would support their restrictive-trade stance.

The negotiations got off to a rocky start when the United States proposed that all trade-distorting policies in agriculture be eliminated over a 10-year period. This caught observers throughout the world by surprise, including many in the U.S., and was dismissed by many as a polar negotiating stance, not a legitimate proposal for ultimate enactment, since the U.S. highly supported agriculture through trade-distorting means. The Cairns group preferred a freeze on existing price supports, coupled with a phased reduction in their levels. The E.C. favored reductions in support after world prices were at higher levels. Producer subsidy equivalents (PSEs) were suggested as the best devices for negotiating reduced levels of internal support, despite their problems (see Chapter 5).

Instead of paving the way for an agreement, the three proposals were divisive, resulting in a collapse of the GATT talks in December 1988. The talks were restarted in April 1989, but there was still much work to be done and the conflict between the U.S. and E.C. was heated. The disagreements in agriculture threatened to jeopardize the entire Uruguay Round.

A U.S. proposal for an agreement emphasizing three areas was submitted in December 1989. Those areas were market access, export subsidies, and internal support. These are the same three areas of ultimate agreement for the Round with respect to agriculture. A more detailed plan with specific targets in those areas was submitted by the U.S. in December 1990, and the Cairns group submitted another specific plan based on the U.S. proposal. Both plans called for the elimination of export subsidies and the conversion of all non-tariff barriers to tariffs. The E.C. was not happy with those plans.

The Director-General of the GATT, Arthur Dunkel, submitted a draft Final Plan for the Uruguay Round in December 1991 that included all negotiating areas, including agriculture, intellectual property, and services. Dunkel tried to strike a compromise among the various agricultural plans since agriculture was the major sticking point for the entire Round. This draft Final Act was approved by the GATT members as the basis for concluding the Uruguay Round, but the final negotiations were halted by the E.C.'s demand to weaken the agricultural provisions -- effectively blocking the entire Round because of agricultural conflicts. But the U.S. and E.C. reached a compromise on export subsidies and internal support in November 1992 (the Blair House Agreement), leading to the final agreement in December 1993. The pressure for the E.C. to reform its farm policies (due to budget constraints) allowed the agreement take place at that time.

## Uruguay Round -- Terms of the Agreement

The three areas included in the December 1989 proposal -- market access, export subsidies and internal support -- served as the main elements of the agreement for agriculture. Despite being signed in 1993 and beginning in 1995, the base years for liberalization in these three areas were in the 1980s (1986-88 for market access and internal support; 1986-90 for export subsidies). This allowed the higher prices in world agricultural markets that occurred throughout the 1990s to count towards the Uruguay Round commitments (thus reducing the needed liberalization).

All countries committed to transform their trade barriers to tariffs immediately, with a few exceptions. This tariffication process bound the tariffs for all products and established a ceiling on future tariff rates. All tariffs were reduced by a minimum of 15% over a six year period (a 10-year period for less developed countries, LDCs) and by an average of 36% over all commodities (24% for LDCs). The average was calculated as a simple average of tariffs over commodities, so it was not weighted by the commodity's importance in trade. Thus, a country could choose to reduce high tariffs on products that were not heavily imported, so the agreement's minimum 15% reduction is important.

For products where imports were less than 5% of domestic consumption, there is a 3% minimum access opportunity in the first year of the agreement where imports are subjected to a preferential duty rate. This minimum access opportunity amount increases to 5% by the end of the agreement. This provision essentially established a tariff-rate quota for products where imports have historically been low.

The agreement called for no new export subsidies for agricultural products and for cuts in current export subsidies. Over six years (ten years for LDCs), beginning in 1995, members were to cut the quantity of products with export subsidies by 21% and the total budgetary outlays for export subsidies by 36%. Because world prices rose markedly between the late 1980s and mid-1990s (and the level of subsidy needed for exportation had fallen), the quantity adjustments were more constraining than the budgetary reductions. Genuine food aid was not counted as an export subsidy. Countries also agreed not to retaliate against existing export subsidies (through countervailing duties), the so-called "peace clause."

The commitments for reducing internal support for agriculture were more sensitive because of the division over which policies count as internal support. All policies were divided into ones that distort trade (called Amber policies) and those that do not distort trade (Green Box policies). Only Amber policies were targeted for reductions; the dollar value of those policies is labeled the Aggregate Measure of Support (AMS). The AMS is similar in concept to the PSE, but is calculated in a different way and does not include non-trade distorting policies. Furthermore any AMS for a commodity that amounts to less than 5% of production (or 10% for a less developed country) is classified as "de minimis" and not counted.

Green policies include costs of general services (research, extension, inspection, marketing and promotion), public stockholding, decoupled income support, crop insurance and income safety nets, and conservation programs. These programs do not encourage production of particular products and are, therefore, classified as non-trade-distorting. Amber policies include price supports, marketing loans, acreage payments, livestock payments based on animal numbers, input subsidies, and some subsidized loans. Exempt from the Amber category are direct payments to producers that are linked to production-limiting policies (Blue Box policies). These exemptions include U.S. deficiency payments for crops and the E.C. compensatory payments system.

The agreement called for countries to reduce their AMS by 20% over six years (13% over ten years for LDCs). The AMS has three components: the implied tariff (equal to domestic price minus world price multiplied by the quantity of domestic production), direct payments to producers (measured by government expenditures), and other government outlays (measured by expenditures). Any producer assessments to pay for this AMS are subtracted. The AMS limits, 2001 AMS, 2001 Green box, and 2001 Blue box expenditures are presented in Table 6.1. Note that all countries are well below their AMS limits and that Green box expenditures are high for the EU, US, and Japan, while Blue box expenditures are high for the EU.

**Table 6.1. Expenditures by Various Countries as Classified by the WTO, 2001, in billion US dollars**

	EU	US	Canada	Japan
Brazil				
AMS limit	\$65.4	\$19.1	\$2.8	\$32.7
\$1.0				

Current AMS \$ 0	\$35.8	\$14.4	\$0.5	\$ 6.0	
Green box \$1.8	\$19.4	\$50.7	\$1.1	\$21.0	
Blue box	\$21.2	0	0	\$ 0.7	0

Source: Walsh, Brockmeier, and Matthews

All waivers and special exemptions for agriculture are removed by the agreement, and there are special provisions on sanitary and phytosanitary (SPS) regulations (rules that protect human, animal, or plant life and health from biological and chemical risks). Under the agreement, the SPS regulations must be based on science. Countries are encouraged to use international standards, but are allowed to have their own, stricter regulations if they have scientific evidence and a risk analysis to back-up the regulations.

*Explanation Box 6.2 International Organizations for Technical Standards*

*The international organizations for technical standards are the Codex Alimentarius Commission, which is concerned with human health issues, fair practices in food trade, and food standards; the International Office of Epizootics, which is concerned with trade in animals; and the International Plant Protection Convention, which develops plant quarantine requirements.*

## The World Trade Organization and the Doha Round

The World Trade Organization (WTO) supersedes the GATT because it is a more encompassing organization. The framework for the organization came from the Marrakesh Agreement Establishing the World Trade Organization, which was concluded on April 15, 1994. The WTO came into force on January 1, 1995. Its primary functions are to implement WTO agreements, negotiate new agreements, settle disputes, review trade policies (to improve adherence and transparency), cooperate with other multilateral organizations (such as the IMF and World Bank), and to provide technical assistance to LDCs. Much of the law in WTO came from earlier GATT agreements. Annexes to the agreement include the following multilateral agreements: Agreement on Agriculture; Agreement on the Application of Sanitary and Phytosanitary Measures; Agreement on Textiles and Clothing; Agreement on Technical Barriers to Trade; Agreement on Trade-Related Investment Measures; Agreement on Rules of Origin; Agreement on Subsidies and Countervailing Measures; and Agreement on Safeguards.

The WTO's goals involve more than trade – to increase standards of living; to attain full employment; to grow real incomes; and to expand production and trade. These goals are achieved through reduction of trade barriers and elimination of discrimination among nations. The most important principles of the WTO are identical to the GATT: national treatment, most favored nation (MFN) treatment, and transparency. Regional agreements and special concessions for LDCs are the only exceptions to MFN.

### *Discussion Box 6.1 National Sovereignty and the WTO*

*A key question relative to the future of the WTO is, How willing are the large nations to allow WTO rules and panels to impinge on their national sovereignty? The entry of the U.S. and other countries into the WTO was controversial. Some in the U.S. felt that there was no reason why the largest and most powerful country in the world should have one vote on issues associated with the world trade. Further, the U.S. might be required to abide by the ruling of a three-person panel concerning some policy enacted by the U.S. Congress. The U.S. Congress sometimes considers (and even enacts) policies which are clearly illegal according to the WTO.*

*The E.U. has shown through its actions in the beef-hormone dispute that it doesn't like abiding by WTO rulings and is doing everything possible to avoid changing its policies in some instances. There are many such examples where national interests collide with the WTO. Yet, if national interests are allowed to prevail, the WTO will collapse. One cannot allow powerful nations to escape WTO rulings and expect less powerful nations to be a part of the organization. Further, if national interests prevail in one case, the floodgates will be open for protracted future cases. There is no question that all WTO-member nations must be willing to give up national sovereignty and interests if the WTO is to be an effect organization in world trade.*

The WTO has an appointed director general and a Secretariat with over 625 employees that keep the organization operating. The real power in the WTO, though, resides in its 156+ member nations, who set the agenda and make the decisions. Almost all decisions are reached by consensus, so every member has veto power. Yet most members don't exercise that veto power, even when they disagree. Instead, the negotiations continue until all nations are reasonably satisfied with the particular decision.

In order to join the WTO, a country must accept the current WTO agreement, all multilateral trade agreements, and obtain agreement from all existing members. The membership process involves the country introducing its current policies to the membership, individually negotiating with each member on accession, drafting membership terms that are consistent with the accession agreements, and obtaining a positive membership decision by consensus (or a two-thirds majority vote if consensus isn't present). This can be an arduous process; it took China fifteen years and 900 pages of accession text to gain entry (in 2001). It took Russia nine years to negotiate its entry into the WTO in August 2012 (it was the 156<sup>th</sup> member). The new member receives all the benefits of WTO membership (the past progress in trade liberalization and other benefits). Its accession pledges are what existing WTO members receive in return. Countries can withdraw from the WTO (none have), but they cannot be expelled.

The WTO adopted the Dispute Settlement Understanding from the Uruguay Round, making it more formalized and stronger than the often confusing, ad hoc manner of settling disputes under GATT (Hudec). This method for handling disputes emphasizes resolution through consultations among the parties. Once a

complainant (the country with the complaint) files for a dispute with the WTO against the respondent (the alleged rule-breaker), the parties are to enter consultations within thirty days. If there is no resolution of the conflict within 60 days, the complaining party can ask that a panel be assembled. If the two sides cannot agree on membership of the panel, the director general of the WTO will appoint the panel. The panel hears the case, and renders a decision within nine months after its establishment. There is also an Appellate Body to hear appeals, which has sixty days to finish its work. Finally, reports dealing with implementing the decision come to the Dispute Settlement Body within a “reasonable length of time” and it gives the final ruling. The only complete resolution of the matter comes when the offending party changes its policy to make it consistent with WTO rules. However, compensation can be used until the concessions covered by the complaint are withdrawn. Membership in the WTO implies consent to decisions of the panel, appellate, and Dispute Settlement Body.

This new dispute mechanism makes it easier to resolve issues because there is a clear timetable for the settlement. There are also clear winners and losers. However, there is still no way that the winning party can guarantee that the losing party will ever follow through with compensation or change the offending policies. If there is no redress, however, the winning party can place sanctions on the losing party. There were seven authorized retaliations between January 1995 and September 2004 (Van den Bossche), including the U.S.’s foreign sales corporation law (\$4.0 billion); the E.C.’s banana import regime (\$191 million); and the E.U.’s policy on hormone-treated beef (\$117 million for the U.S. and \$11 million for Canada). Case Box 6.1 outlines the EU banana dispute.

#### *Case Box 6.1 The EU Bananas Dispute*

*Banana import policies differed widely among European Union member nations. Germany allowed entry without duty; Spain only imported from the Canary Islands; others had preferences provided to former colonies in Africa, Caribbean, and the Pacific Group (ACP countries). In 1993, the EU came up with a tariff rate quota scheme that favored imports from ACP countries (though non-ACP countries had quotas too). The quotas were not based on historical import or production and the quotas were more than the ACP countries could supply (allowing them to sell their licenses to other countries). Ecuador, Guatemala, Honduras, Mexico, and the US (none of whom are ACP countries) disputed the import system in 1996 by arguing that it violated national treatment, favoring some supplying countries (where EU multinational corporations had operations) over others (where US multinational corporations had operations). The US could enter the dispute because US multinationals had service agreements to supply bananas (which fall under the General Agreement on Trade in Services (GATS)). These banana policies also violated the Most Favored Nation principle. The bananas dispute had been brought forward through the GATT dispute settlement framework, but the EU always vetoed the panel report (which found the policies in violation).*

*The panel ruled in favor of the claimants in 1999, but the EU kept its policies in place initially. Guatemala, Honduras and Mexico negotiated a settlement with the US. The US and Ecuador could not reach an agreement, so compliance panels were formed. They ruled that the US was allowed to reduce imports from the EU by \$191 million per year; Ecuador was granted \$202 million in concessions (reduced imports) from the EU, but it chose instead to use the concession to reduce protection for EU brands in the Trade-related Aspects of Intellectual Property Rights (TRIPS) Agreement. These sanctions against the EU lasted until 2001 when the EU adjusted their quotas, granting licenses based on historic exports (which allowed more imports from Latin America) and finally moving to an import tariff only scheme by 2006.*



As of January 2012, there have been 427 disputes filed with the WTO since January 1995 ([http://www.wto.org/english/tratop\\_e/dispu\\_e/dispu\\_status\\_e.htm](http://www.wto.org/english/tratop_e/dispu_e/dispu_status_e.htm)). The US and EU account for most of those disputes (as complainant, respondent or a third party participant). The US was involved in 304 of the disputes (71%) – a complainant on 98, a respondent on 113, and a third party on 93. The EU was involved in 268 of the disputes (63%) – a complainant on 85, a respondent on 70, and a third party on 113. The US complaints targeted the EU (19 times), China (12 times), Korea (6 times), Mexico (6 times), and Japan (6 times). US responses have mostly been to complaints from the EU (32 times), Canada (15 times), Brazil (10 times), Korea (9 times), and Mexico (9 times).

The WTO disputes are dominated by the more developed countries because they have the legal staff for the process. The dispute settlement process is quite time consuming and most countries don't have the personnel to devote to such issues. Furthermore, some less developed countries don't want to anger their trading partners (particularly more developed countries which import their products). Brown goes over these and other hindrances that LDCs and smaller countries face in disputes. Nonetheless, it is believed that the culture of dispute settlement under the WTO will be conducive to greater international cooperation. When nations consider joining the WTO, it is made clear that there will be more pressure to follow the outcomes from the dispute settlement procedures and nations are expected to sacrifice some degree of national sovereignty to obtain the benefits of membership to this important international organization.

## The Doha Round

Preparations for the next round of trade negotiations (the first under the WTO) began in Seattle in December 1999. That meeting was marked by huge demonstrations by many groups (especially NGOs, non-government organizations) that viewed the WTO as controlled by big multinational companies and harmful to various causes – labor, the environment, poor people. There were also very contentious issues on anti-dumping, intellectual property, textiles, services, and (of course) agriculture scheduled for negotiation. Agriculture had specific issues that were left unresolved from the Uruguay Round that were to be considered.

Despite the difficulties from Seattle, the round was launched in Doha, Qatar in November 2001 with a scheduled end on December 2004. We are long past the scheduled end but there is an agreement that is close to fruition, but it is much less encompassing than the original plan<sup>[16]</sup>. The Doha (Development) Round was controversial from the beginning because there were so many players involved (146 members in 2003) and some countries had little to gain in areas where other countries asked for liberalization. The EU especially wanted to include Singapore Issues in the negotiations – dealing with Competition Policy, Investment, Government Procurement, and Trade Facilitation – but many less developed countries (particularly India) didn't want them included at all. Less developed countries were very interested in reducing developed country agricultural subsidies (AMS), but not very interested in lowering their own high tariffs in agriculture.

The World Bank (Anderson and Martin) estimated that totally liberalizing trade would increase world incomes by nearly \$300 billion per year by 2015, with \$141 billion going to less developed countries. Agricultural liberalization accounted for 62% of those gains and textiles another 27%. According to Anderson et al. real prices for most agricultural products would increase, including cotton (20.8%), oilseeds (15.1%), dairy products (11.9%), coarse grains (7.0%), and wheat (5.0%). Other commodity prices would increase, but by less than 5%. Most of the gains (93%) in agriculture came from increased market access (lower tariffs); very little came from reducing AMS or export subsidies. Full liberalization would lift 32 million people out of poverty (the poverty line used was \$1 per day). Yet their estimate for a Doha Development agreement under most reasonable scenarios was only \$18 to \$75 billion per year.

The negotiations on the Doha Round have been difficult throughout the years. Various coalitions of less developed countries (with support from many non-government organizations) have influenced the negotiating process and framework. Blustein and others give interesting insights into the progression. The issues are difficult and simply choosing the target areas for the negotiations took a very long time. The Singapore Issues were ultimately dropped, but agriculture remained.

The GATT/WTO trade negotiations on agriculture had to begin with initial ideas (modalities). With so many countries involved, it is natural for some countries (or country groups) to develop proposals for consideration. With that in mind, the US put a proposal on the table in 2002 for agriculture that called for no tariffs greater than 25%, an increase in the quotas for all tariff-rate quotas of 25%, eliminating the Blue Box exemption for AMS, capping overall AMS to 5% of production value, and maintaining the de minimus provision. This proposal was beneficial for the US because its 1996 Farm Bill included few Blue Box policies, and many of its commodity policies fall into the de minimus category.



The EU proposed agricultural liberalization similar to the Uruguay Round Agreement in 2002. The main components were reductions in tariffs averaging 36% for more developed countries and 15% for less developed countries; a drop in AMS by 55%; and reduction in export subsidies by 45%. This was far from what the US proposed.

The US and EU agriculture proposals were met with scorn and derision by many of the LDC coalitions. They felt that the Uruguay Round Agreement did little for them, so they were not keen to let the MDCs dictate the terms for the Doha Round agreement. It didn't help that the US's 2002 Farm Bill increased agricultural subsidies and offered no tangible evidence that the US was interested in liberalizing its agricultural policies. The US and EU met together and hammered out some of the differences in August 2003 (remember that it was the US-EU negotiations at Blair House that contributed to the final Uruguay Round Agreement), but this didn't help at all.

At this point, Stuart Harbison, the chief agricultural negotiator for the WTO, stepped in, much like Arthur Dunkel had with the Uruguay Round Agreement, with a proposal for modalities. Harbison's proposal for agriculture in early 2003 called for high tariffs to fall by a higher percentage than low tariffs (the so-called Swiss formula). All export subsidies were to be eliminated within ten years; AMS (Amber Box) was to fall by 60%, Blue Box expenditures were to be capped and fall by 50%, and the de minimus exemption was to fall by 50%.

Another important group for the negotiations has been the Group of 20 countries (G-20), led by Brazil, China, and India (including Argentina and Thailand too), which represents 50% of the world's population and 67% of the world's farmers. They want an end to all export subsidies and have a very large cut in farm subsidies in more developed countries. The MDCs were spending \$400 to \$500 billion per year on farm subsidies (or \$1 billion per day), which was six times the amount those countries spent on developmental aid (Peterson). US cotton policies were a lightning rod issue where 25,000 US farmers receive \$2-3 billion per year in subsidies while eleven million cotton farmers in West Africa suffered from low world cotton prices (partially caused by US subsidies and exports). The WTO ruled that US cotton policies were illegal (see Case Box 6.2), so the US was not in a good position with respect to cotton or agricultural subsidies in general.

#### *Case Box 6.2 The US-Brazil Cotton Dispute*

*In September 2002, Brazil filed a complaint with the WTO over US cotton policies, claiming that the US introduced new policies after the Agreement on Agriculture that were export subsidies. Brazil argued that export credit guarantees provided by the US government and the Step two payments of the cotton program were illegal export subsidies no longer covered by the Peace Clause (so they were not longer covered by the Agriculture Agreement).*

*A dispute settlement panel ruled in favor of Brazil in September 2004, agreeing that when the Peace Clause expired, many US subsidies fall under the SCM Agreement, rather than the Agreement on Agriculture. This was a problem with Step 2 because it was a new subsidy enacted after the Uruguay Round Agreement. Further, the export credit guarantee programs were prohibited export subsidies. Finally the panel ruled that these subsidies had materially suppressed cotton prices, thus harming Brazil. An appeal by the US was denied in March 2005.*

*A compliance panel said the US wasn't fully complying with the ruling in December 2007, so Brazil claimed the right to impose \$2.5 billion in retaliatory sanctions against the US, but a panel granted Brazil sanctions for \$829 million -- \$591 million in retaliatory tariffs and \$238 million in intellectual property rights. Brazil didn't want import tariffs increase on goods because they mostly import intermediate and capital goods from the US. However, the IPR sanctions and other tariff increases caused consternation with various US companies. Just before the sanctions were to take place, a deal was brokered between Brazil and the US. The US now gives the Brazilian cotton industry \$147 million in cash each year and the US has promised to re-evaluate its fresh import policy for Brazil beef.*

*It is interesting that Brazil brought the case even though West African producers may have been harmed even more. Two African producing countries, Benin and Chad, were third parties to the case, but Brazil brought the experts together for testimony (some of whom were from the US), had their lawyers argue the case, and took the brunt of criticism from the US government and public. However, in the end, US cotton policies remain unchanged; it is only costing the US government money.*

The meeting of trade ministers in Cancun Mexico was scheduled for September 2003 because it was thought that sufficient progress had been made to come up with final modalities that could move the negotiations forward. Instead, the negotiations broke down completely because of the Singapore Issues and agriculture. The G-20 and other LDCs simply felt that the MDCs were dominating the proceedings and walked out of the negotiations.

There is still some action on Doha Round negotiations periodically with respect to agriculture. For instance, the WTO has draft modalities for agriculture that were established in December 2008 (see Explanation Box 6.3). Yet it is unclear that these modalities will ever serve as the basis for an Agriculture Agreement from the Doha Round. It is also unclear what this lack of agreement means for the future of the WTO. One can be depressed about this lack of progress, but Lambert and McKoy found simply being a member of WTO stimulates agricultural trade. They estimate that agricultural trade is 300% higher when both parties are WTO members, but much of that trade might be diverted from non-WTO members. They argue that WTO membership coincides with many changes within the country that promote trade, including reducing uncertainty for firms investing in trade relations.

#### *Explanation Box 6.3 Draft Modalities for Agriculture, December 2008*

*The draft modalities from December 2008 have a tiered structure for reducing AMS and increasing market access, meaning that larger cuts are made when values are higher. The WTO uses the concept of Overall Trade-Distorting Domestic Support (OTDS) for the following reductions in AMS over five years:*

*80% if OTDS > \$60B  
70% if \$10B < OTDS < \$60B  
55% if OTDS < \$10B*

*The overall reduction in tariffs for MDCs is at least 54%, with the following reductions in tariffs over a 10 year period:*

*50% reduction if tariff < 20%  
57% reduction if 20% < tariff < 50%  
64% reduction if 50% < tariff < 75%  
70% reduction if tariff > 75%*

*The de minimus provision continues but its overall level is reduced by 50% immediately. Blue Box exemptions are continued but they can be no more than 2.5% of agricultural production value (with 1995-2000 as the base). There are provisions for countries to declare some percentage of their tariff lines as sensitive, allowing lower reductions in tariffs for those goods. There is also language on expanding import quotas for tariff-rate quotas.*

## Two Other Important International Agencies

There are two other important international agencies that have a large impact on world trade, macroeconomic conditions, and development: The International Monetary Fund (IMF) and the International Bank for Reconstruction and Development (World Bank). Both of these organizations are officially under the UN, but they are truly independent administratively and financially. Both the IMF and World Bank were created soon after World War II.

### International Monetary Fund

The concept of and need for the IMF grew out of the global depression of the 1930s, which was partially caused by steep tariff increases and currency devaluations aimed at stemming balance of payments problems. Countries tried to reduce their problems by devaluing their currencies to increase their exports and reduce their imports. The world trading system collapsed after a series of devaluations caused tremendous instability in the world market.

The IMF was created to provide a pool of funds that countries can use to get out of temporary balance of payments problems. The IMF's goals are to help countries manage their payments balances efficiently and to help countries institute policy reforms that will help with a long-run resolution of these problems. If IMF loans are used properly, they will keep countries from devaluing their currencies to overcome short-term currency shortages. The IMF documents and monitors macroeconomic policies on all of its member countries.

The IMF conducts "missions" or studies for many LDCs with outstanding loans. The outcome of the mission is a set of recommended changes in policies and institutions that will assist in moving the country toward macroeconomic stability. Most IMF loans are made on the condition that certain policy reforms will be enacted (so-called structural adjustment programs). These adjustments might include cutting subsidies, selling state-owned enterprises, cutting the budget deficit, devaluing the currency, or other changes that are difficult for the country to implement. The terms of these policy changes are part of the loan negotiation process. If the policy changes are not enacted, the country may not be allowed to draw further on its line of credit or may not be approved for new loans. Because the IMF now deals in longer-term debts it is a more important development financier than its original charter.

Countries must sign rules of conduct and articles of agreement to become IMF members. They must allow free exchange of their currency and there must be a relatively open macroeconomic policy system that is easily tracked by the IMF.

The IMF receives funds from its member countries, and the amount of money available for loans to a particular country is proportional to its subscription rate (or membership dues). The subscription rate for each country is based on international economic importance, and voting is based on contributions. The Fund is governed by a board of governors representing its members.

In recent years the IMF has had huge demands on its financial resources. It increasingly finds itself teaming with countries like the U.S. and Japan to meet the financial needs of many countries. The IMF, though, has a trained team of macroeconomic experts with international expertise in handling balance of payments crises. Its involvement in these difficulties brings an international perspective to the crisis that helps overcome the political aspects of help that often comes with unilateral programs.

### International Bank for Reconstruction and Development (World Bank)

The World Bank's chief role is financing long-term development projects in LDCs. The Bank uses the funds it receives from its member nations, along with funds it borrows from international credit markets, to finance projects that would not normally be handled by the private sector. In the early years, many of the World Bank's projects involved water system development; road, bridge, and dam construction; agriculture; and other basic system needs. The Bank still funds many such projects, but now its role is more diverse given the wide range of needs throughout the developing world.

A World Bank project is developed in collaboration with the host government and is ultimately approved by the Bank's Board of Directors. Project loans from the World Bank go to host governments at concessional rates. It is normally the government's responsibility to manage the project. Over the years the Bank has increasingly been involved in structural adjustment loans that are contingent upon policy reforms in the country. Often the IMF and World Bank work in concert to determine the financial needs for structural reforms, and the Bank will come through with the needed long-term financing. Yet, there are times when the individual roles of the IMF and World Bank are clouded, especially when the two institutions do not agree on needed reforms or the timing of such reforms.

There are also regional development banks that work in a manner similar to the World Bank. These include the African Development Bank, the Asian Development Bank, the Inter-American Development Bank, and the European Bank for Reconstruction and Development.

## Summary

1. The main guiding principles of the GATT/WTO are reciprocity, non-discrimination, transparency, national treatment, and compensation.
2. GATT/WTO negotiations are normally handled through Rounds where specific sectors are targeted for trade barrier reductions.
3. The Uruguay Round began in 1986, and agriculture was a major focus of the Round. Other important areas covered by the Round were intellectual property, services, trade-related investment measures, and the dispute settlement process.
4. Initially in the Uruguay Round, there were three groups with proposals for agricultural trade liberalization, the U.S., the E.U., and the Cairns Group. The talks collapsed in December 1988, but after much negotiation between the U.S. and E.U. (and a major reform of the E.U.'s Common Agricultural Policy) a final agreement was reached in December 1993.
5. The Uruguay Round agreement for agriculture involved three main components. All trade barriers were transformed into tariffs and these tariffs will be reduced by a minimum of 15% (an average of 36%) over six years. Countries must reduce their aggregate measure of support by 20% over six years. Countries cannot introduce new export subsidies and they must reduce existing export subsidy programs by 21% in quantity and 36% in value.
6. The World Trade Organization was formed as a more encompassing organization to supersede the GATT. The WTO has a stronger dispute settlement process and more means to enforce rules. Yet the current round of negotiations, the Doha Round, has seen little progress in agriculture or most other issues.
7. Two other important international economic organizations are the IMF, which loans money to government for stemming balance of payments problems, and the World Bank, which finances long-term development projects in less developed countries.

## Questions

1. Why were the Uruguay round GATT negotiations so important for agriculture? Why were they so difficult?
2. Are you in favor of U.S. membership to the WTO or did the U.S. sacrifice too much sovereignty? Explain.
3. Would you be in favor of the U.S.'s initial stance in the Uruguay Round -- to eliminate all government support to agriculture? Why?
4. What agricultural product trade has been most influenced by liberalization brought about by the Uruguay Round?
5. Why have the Doha Round negotiations been so difficult? Have agricultural issues made this round more contentious? How?

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## Chapter 7                      Preferential Trade Agreements

Despite all of the progress on trade liberalization that has been made through the GATT since 1946, there have been numerous efforts to form alliances among countries for free trade. These alliances, which allow liberalized trade among the members, are called *preferential trade agreements* (PTAs) and they come in two general forms – the free trade area (FTA) and the customs union (CU). The best-known FTA is the North American Free Trade Agreement (NAFTA) among Canada, Mexico, and the U.S.; while the best-known CU is the European Union (E.U.) among most countries of Western Europe.

This chapter covers the theory of preferential trade agreements and the situations when member countries gain and lose. The key factor determining whether countries gain or lose is what happens to tariff levels and therefore prices. If they fall, the country will likely gain; if they don't the country might lose tariff revenue and import from relatively inefficient member countries, reducing welfare of the member nations. The best-known FTA, NAFTA, and CU, the E.U., are covered in some detail to provide an idea of what it is like to form and operate under PTAs.



## Introduction to PTAs

Customs unions have no trade barriers among members and the members also have a common external tariff (for non-members). Often a CU will have free movement of production factors (labor, investment capital, etc.), harmonized standards, and even a common currency (in the case of the E.U.). Free trade areas allow the member countries to keep their own trade barriers with non-members, but there are rules of origin which keep non-member goods from being re-exported between FTA members.

Preferential trading agreements violate the GATT/WTO principle of most favored nations: once a trade barrier is lowered for one GATT-member country, it should be lowered for all member countries. However, Article 24 of the GATT allows an exemption for PTAs as long as they involve 100 percent lowering of tariffs among their members (i.e., when tariffs are eliminated). When trade barriers have not been completely eliminated (which is the case with NAFTA), the GATT has viewed them as coming close enough to get approval under Article 24. Often PTAs involve a transition period where tariffs and other trade barriers are slowly scaled to zero. A PTA will not receive a GATT exemption if the agreement raises tariffs for non-PTA members.

The U.S. was initially against Article 24 because it thought that PTAs (and regional trade agreements or regionalism) would undermine multilateral negotiations through the GATT. As will be seen later in this chapter, there is a theoretical dispute concerning whether PTAs increase global welfare. There are trade creation effects, which are positive, and trade diversion effects, which are negative. The U.S. was quite vocal in its opposition to PTAs because there are only trade creation effects from multilateral trade liberalization through the GATT.

Yet the U.S.'s attitude changed in November 1982, when a new GATT round was not launched, against the strong wishes of the U.S. The U.S. immediately began negotiating bilateral agreements with Canada and Israel the following year, arguing that bilateral agreements and PTAs would move countries into multilateral negotiations. Since 1982, there has been a proliferation of PTAs throughout the world that has continued without slowdown. In January 2012 there were 222 PTA agreements in force (WTO). The U.S. has bilateral agreements with Australia (since 2004), Bahrain (2006), Chile (2003), Israel (1985), Jordan (2002), Korea (2012), Morocco (2005), Oman (2009), Peru (2009), and Singapore (2003). The U.S. is a member of the NAFTA and the Dominican Republic - Central America Free Trade Agreement (CAFTA-DR). Thus a total of twenty countries have free trade access to U.S. markets.

This chapter will cover the economic aspects of PTAs and go over conditions when the world benefits from their creation and when the world loses from their creation. Later in the chapter the two largest PTAs, NAFTA and the E.U., are discussed to highlight the negotiation process, rules concerning their operation, and changes they have brought to the rest of the world.

## Welfare Aspects of PTAs

The main distinguishing factor between PTAs and pure trade liberalization is that there is a tendency for exports to be diverted from low-cost suppliers to higher-cost suppliers as a result of trade preferences. Table 7.1 provides a simple example of the negative aspects of trade diversion. The trade creation and diversion examples include a common external tariff for the countries for simplicity, so the PTA is a CU.

Assume that country A and B enter into a CU, but country C is excluded. Before the agreement, each country imports wheat from country C, the low-cost wheat producer (as shown in column 2 of Table 7.1). The price for a bushel of wheat is \$6, \$4, and \$3, respectively, in countries A, B, and C because of the \$3 tariff (t) for country A and the \$1 tariff for country B. This analysis assumes that transportation costs are zero and there is perfect competition, so price differentials among countries reflect tariffs.

**Table 7.1 Examples of Trade Creation and Trade Diversion\***

Country	Before CU	
After CU (TD)	After CU (TC)	
A (t=3)	\$6(t=3) \$4 (t=1)	\$6
B (t=3)	\$4(t=1) \$4 (t=1)	\$6
C \$3	\$3 \$3	
trade pattern	C to A	
B to A	C to A	
	C to B	
	C to B	

\*t is tariff

TD is trade diversion case

TC is trade creation case

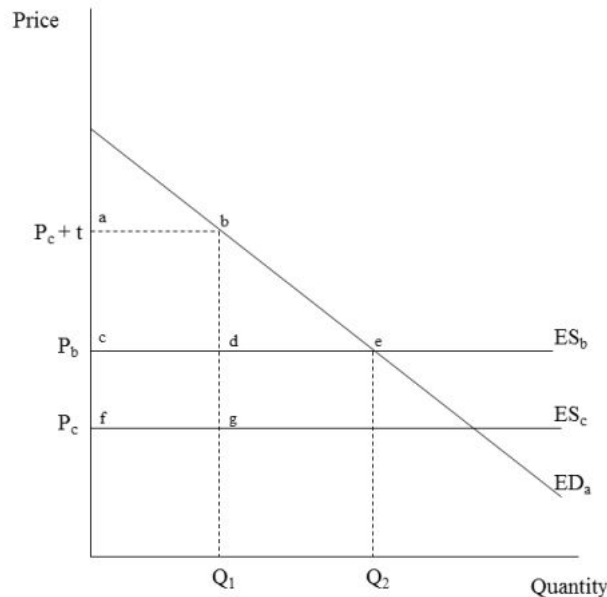
Trade diversion would occur in the wheat example if there is a set of policies that encourage country A to import wheat from country B. The reason is that before the CU, country A was importing from the low-cost producer. Importing from country B would be encouraging higher-cost producers to increase wheat production and would therefore be inefficient (and decrease world welfare). Column 3 shows a situation where the external tariff for the CU is \$3 per bushel, the same tariff that prevailed in country A before the CU. This tariff would result in increased production in country B because the internal price in B increases by \$2 per bushel. Some of that increased production in B would be shipped to A (and crowd out imports from country C), so trade would be diverted from exports of country C to country B. Trade diversion occurs because the costs for the added production in country B is greater than the costs for the production in country C, which was “crowded out.”

Trade creation would occur in the wheat example if production in country B is not encouraged, as shown in column 4. In this case, the common external tariff is set at \$1 per bushel, identical to the initial tariff in country B. There is no increase in B’s production, but there are trade creation benefits because of the lower price in country A and the increased exports from country C to country A. Wheat continues to move from country C to B, as it did before the CU.

Examples of trade diversion and trade creation are shown graphically in Figures 7.1 through 7.3. Figure 7.1 shows the trade diversion effects of a CU between countries A and B.  $ED_a$  is the import demand curve for wheat in country A.  $ES_b$  and  $ES_c$  are the export supply curves for countries B and C, respectively, and both are assumed to be perfectly elastic (so country A is a small country). Without the customs union, if

the tariff for country A is  $t$ , it imports  $Q_1$  units of wheat from country C and country A receives tariff revenue of area  $abfg$ . There is no trade between country A and B.

Figure 7.1 Results of a Customs Union with Trade Diversion



When the customs union is formed, there is free trade between countries A and B, so the price in country A falls to  $P_b$  (as long as country B's excess supply curve is perfectly elastic) and country A imports exclusively from country B as long as the external tariff is greater than  $P_b - P_c$ . Country A gains surplus area  $abce$  because its internal price has fallen to  $P_b$ , but it loses area  $abfg$  because it no longer collects tariff revenues [17]. One must compare the  $bde$  triangle with the  $cdfg$  rectangle to determine whether country A gains from the CU for the wheat market.

Figure 7.2 pinpoints the gains from the CU accruing to country A when there is trade diversion. In the figure, the original internal price in country A is  $P_c + t$  and all imports are from country C. Imports are  $Q_4 - Q_3$ , and tariff revenue for country A is area  $bcij$ . When a CU is formed with country B, the price falls to  $P_b$  and imports increase to  $Q_6 - Q_5$ , but tariff revenue is zero because all wheat comes from country B. The increase in consumer surplus is area  $acd$ , the reduction in producer surplus is area  $abde$ , and the decrease in government revenue is area  $bcij$ . The net gain in the wheat market because of the CU is  $bef + cgh - fgij$ , which is ambiguous. If the price difference between country B and country C is small, there should be net gains to country A. Note that imports with free trade are  $Q_2 - Q_1$ .

There is no question that country A would gain if it had a CU with country C, because it would be obtaining the benefits of full trade liberalization, but gains may be negative for the CU with country B. The key element which causes trade diversion is that the discriminatory trade policies encourage country A to import from higher-cost producers in country B, diverting imports from the low-cost producers in country C.

This crowding out of production in country C with production in country B also makes the world worse off.

Figure 7.2 Gains for Country A from the Customs Union with Country B -- Trade Diversion

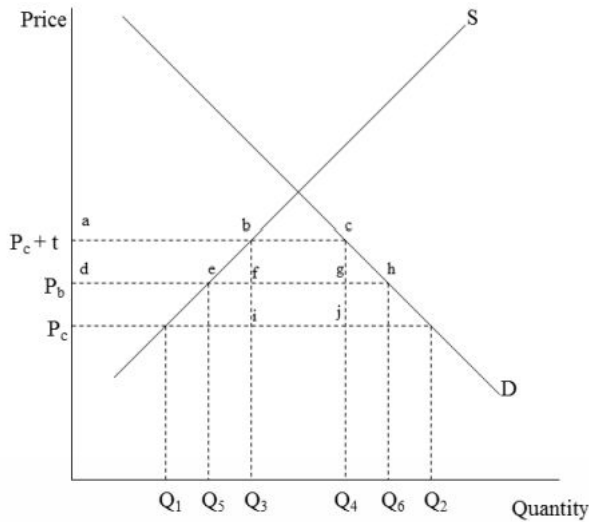
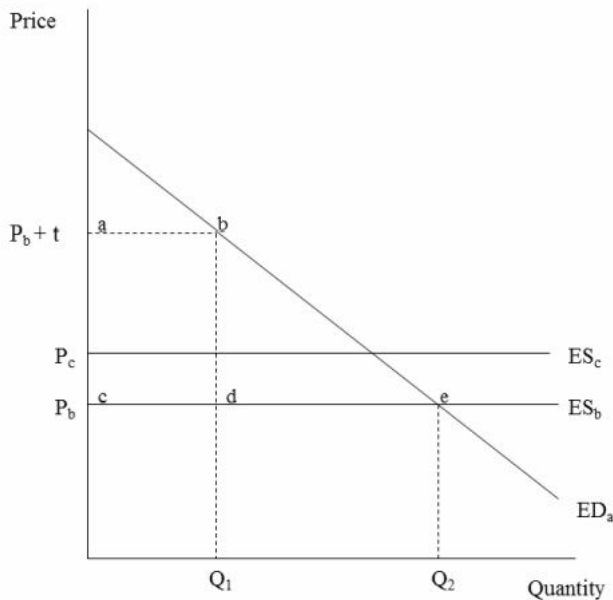


Figure 7.3 covers the case when the CU between country A and country B is trade-creating. In this case, country B is the low-cost producer and the gains from trade are the familiar trapezoid *abce*. The price in country C is above the price in country B, so there is never an incentive for country A to import from country C. Country A clearly gains from the CU because the surplus gain more than compensates for the loss in tariff revenue of area *abcd*.

Figure 7.3 Results of a Customs Union with Trade Creation



These examples show the basic idea behind trade creation and trade diversion, yet the assumption that country B's export supply curve is perfectly elastic is simplistic. In the next case, assume that country B has an upward-sloping export supply curve, while country C has a perfectly elastic export supply curve [18]. Trade diversion with an upward-sloped export supply curve for country B is shown in Figure 7.4.

In Figure 7.4, the equilibrium before formation of the CU has imports from countries B and C facing the tariff,  $t$ . The internal price in country A is  $P_c + t$ , resulting in imports of  $Q_1$  and  $Q_3 - Q_1$ .

respectively, from countries B and C. Country A's gains from trade are area  $abd$  plus area  $bdeh$  (the tariff revenue,  $t$  times  $Q_3$ ).

When the CU is formed and imports from country B are allowed into country A duty-free, there is no change in country A's internal price as long as the tariff remains the same, so the surplus area  $abd$  does not change. However, there is a reduction in the amount of tariff revenue because imports from country B are not taxed. Because of duty-free access, exporters from country B are able to supply wheat to country A at a lower price, increasing their exports to  $Q_2$  and crowding out exports from country C by  $Q_2 - Q_1$ . The net welfare effect on country A is that welfare falls by area  $bceg$ , the fall in tariff revenue.

Country B is the winner from the formation of the CU for wheat because it exports more to country A. Its gain is area  $bcef$  because its exports grow from  $Q_1$  to  $Q_2$ . Yet when the gains to country B are summed with the loss of country A, net welfare for the two countries falls by area  $cfg$  – the dead weight loss associated with higher-cost producers in country B crowding out producers in country C. The best course for country A is complete liberalization with all countries, which would provide a net increase in welfare of area  $dhi$  because the internal price in country A would then reflect world production costs of  $P_c$ . Country A would increase imports to  $Q_4$ , importing  $Q_1$  from country B and  $Q_4 - Q_1$  from country C.

Figure 7.4 Trade Diversion with Rising Costs for Country B

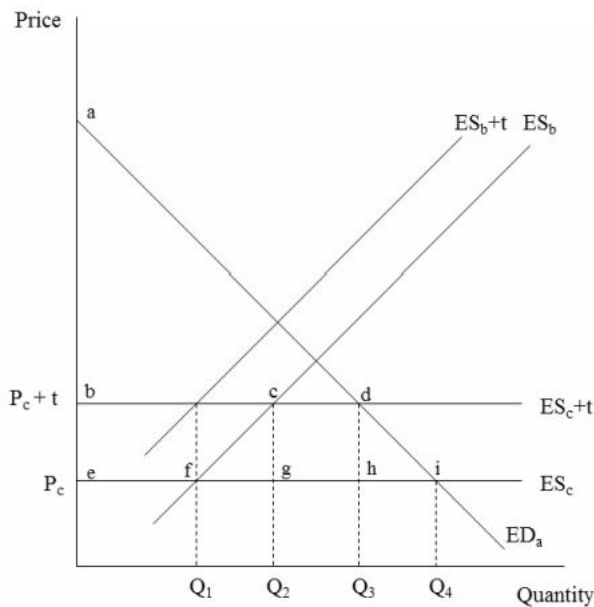


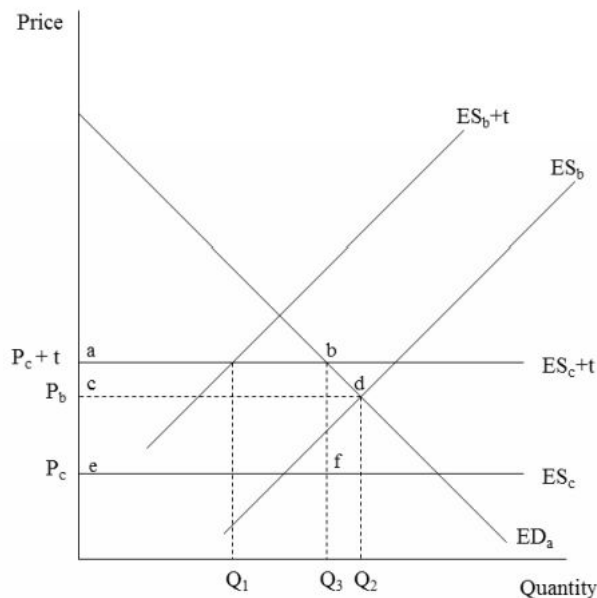
Figure 7.4 was drawn such that country A continues to import from country C with the formation of the customs union. This is not necessarily the case. If  $ES_b$  intersects  $ED_a$  at a point beyond  $Q_3$  (as shown in Figure 7.5), country A will import exclusively from country B. In this case, country A would begin to experience a lower internal price, consistent with the price in country B ( $P_b$ ). Country A would have a surplus gain of area  $abcd$  from the lower internal price, but would lose all of its tariff revenue (area  $abef$ ) because no imports would arrive from country C. There would be dead-weight losses because production shifts from country C to country B, but the more the intersection of the  $ES_b$  and  $ED_a$  curves lies to the right of  $Q_3$ , the lower the net losses to country A. These lower net losses are because country B's producers are more efficient than in Figure 7.4, so the losses in bringing them into production to supply country A are lower.

Note that this analysis is for a product that is imported by country A and exported by country B. In this case, country B gains and there is a possibility (if trade diversion is large) that country A will lose. Yet, there are other commodities where country A will export to country B and country A will therefore have clear net gains from the CU. It is these gains in other commodities that encourage country A to enter into the CU.

The economic analysis of welfare gains from PTAs has focused on a discussion of trade diversion because this concept is new for this chapter. PTAs involve many possibilities concerning the ultimate tariff

levels that pertain to countries involved in the agreement. The levels of these tariffs for non-members are what lead to trade creation versus trade diversion. If a country enters a PTA and simultaneously lowers its external tariff on non-members (or if countries entering a CU agree to establish the common external tariff at the lowest level among member countries), the possibility for trade diversion effects is lessened.

Figure 7.5 Trade Diversion with More Efficient Producers in Country B



One final comment on how PTAs distort behavior involves foreign direct investment. PTAs will not only divert trade but also they will change investment patterns among countries. Many companies have chosen to establish facilities in Europe to gain access to lower trade barriers among E.U.-member countries. Asian and European companies have considered investing in Canada and Mexico to gain access to NAFTA treatment and free trade among the three member countries.

These changes in foreign direct investments can generate misleading statements about the effects of PTAs. The U.S. textile industry has been characterized by sustained contraction for many years because of firms moving abroad to take advantage of lower costs. Some of these firms left for Mexico, and frequently observers blamed their exits on NAFTA. This observation is partially true. The firms decided to locate in Mexico because the tariffs they face when exporting back to the U.S. might be lower in Mexico. However, their decision to exit the U.S. was not because of NAFTA, but because of lower cost structures for textile manufacturing outside the U.S. The fact that they chose to locate in Mexico rather than Costa Rica, Honduras, Indonesia, or elsewhere is due to NAFTA. This is another example of trade diversion, since textiles will flow from Mexico to the U.S., rather than other countries which have lower cost structures than Mexico.

## North American Free Trade Agreement

An example of a free trade area is the North American Free Trade Agreement (NAFTA), which began in 1986 with negotiations between the U.S. and Canada. The discussions leading to the final agreement, which was called the Canada-U.S. Trade Agreement (CUSTA) at the time, were relatively painless and moved rather quickly. That agreement went into effect January 1, 1989, where all bilateral tariffs were phased out over a five- or ten-year period, depending on the product (though temporary "snapback" provisions existed to prevent import surges). In addition, a number of bilateral working groups began to harmonize rules and regulations imposed to protect animal, plant and human health. Now trade between the U.S. and Canada has few hindrances, though there are still policies (such as U.S. dairy and sugar policies, and Canadian poultry policies) that impede trade.

Mexico's movement toward free trade began in 1986, when it joined the GATT. This was a signal that Mexico was willing to open its economy to the rest of the world and suffer the adjustments necessary to obtain the benefits of more liberalized trade. Mexico was forced into this decision because it had failed so miserably in its past policies of protection. In 1986, it had a foreign debt of \$99 billion, second only to Brazil's \$111 billion, and debt service payments were 79 percent of its export revenues (International Monetary Fund). Gross national product had fallen by 10 percent in 1986 and inflation was running at an 86 percent annual rate. Over 92 percent of Mexico's production was protected through import licenses, which were required before products could enter the country (Congressional Budget Office, CBO). The average tariff rate (weighted by each product's proportion of trade) was 25 percent and some tariffs were as high as 100 percent. Mexico had a heavily protected economy which was performing very poorly.

Mexico underwent an economic metamorphosis between 1986 and 1990, unilaterally liberalizing to meet the GATT guidelines and surpassing them by becoming more open than the GATT requires. By 1990, economic growth was restored, import licenses protected only 19 percent of Mexico's imports (though most of them were for agricultural products), the average tariff was only 12.5 percent, and the maximum tariff was 20 percent (CBO). The Government of Mexico was attempting to tell the world that it was ready to enter as a free-market economy with tremendous growth potential.

In August 1990, President Carlos Salinas de Gortari officially requested that the U.S. and Mexico enter into negotiations for a free trade agreement. Within five weeks, President Bush formally notified Congress that he intended to begin negotiations with Mexico. Canada decided to enter into the process in February 1991, since it already had a free trade agreement with the U.S. Finally, Congress gave the President "fast track" negotiating authority in May 1991 (allowing the executive branch to negotiate the details of the agreement and Congress to vote on the overall agreement) and negotiations began in June.

Mexico's request for a NAFTA reflected their desire to institute permanently the reforms that had already taken place and continue the trade liberalization momentum for the Mexican economy. The country was particularly interested in attracting foreign investment, which it had openly discouraged for many years. Foreign investment was restricted to 49 percent of a project in 1986, but 100 percent foreign ownership was allowed on projects up to \$100 million by 1991. The approval procedures were also streamlined with fewer "bureaucratic" hassles to overcome.

Free trade with Mexico was not a new concept for the U.S., though many people did not know that when the NAFTA negotiations commenced. Many exports from Mexico received duty-free access because of the Generalized System of Preferences. However a larger impact on trade between the U.S. and Mexico was even more affected by the maquiladora program, which started in 1965. It allowed "free trade" between northern Mexico and the United States. Firms locating in specific areas around the U.S./Mexico border, often operating twin plants on each side of the border, are allowed to ship intermediate and finished products across the border without duty on the value-added as long as the goods have not exited the free trade zone.

### *Explanation Box 7.1 The Generalized System of Preferences*

*The Generalized System of Preferences (GSP) allows some less developed countries to have lower import duties than prevail under the Most Favored Nations (MFN) treatment of the GATT. There is a specific GATT exemption for this because it deals with less developed countries.*

Originally most maquiladoras were textile firms which sewed garments and performed other low-skill activities. Now many of them are electronics and transportation equipment firms that perform highly skilled activities. In 1991, they employed 600,000 people and accounted for 37% of Mexico's exports and 23% of Mexico's imports (The Economist). They also accounted for 46% of Mexico's exports to the U.S. and 32% of the imports from the U.S. (CBO). They still exist and in 2011 there were three thousand such plants employing

1.3 million workers (Bacon, 2011). The maquiladora program allowed manufacturing companies to access the U.S. with finished goods without tariffs and to increase the amount of processing performed in Mexico before NAFTA. The program, however, has had minimal impacts in the agricultural sector.

Many bulk agricultural imports into Mexico faced licensing requirements in 1991. The average tariff on U.S. agricultural exports to Mexico was only 11 percent (Runge), yet Mexico's PSEs for crops averaged 40 percent, while their PSEs for livestock averaged below zero (Nelson, Simone, and Valdes). Mexico's PSEs of corn, soybeans, and wheat were particularly high, discouraging imports from the U.S.

The U.S. had lower overall barriers on agricultural imports from Mexico, but there were certain tariffs that varied by season to protect U.S. producers, particularly for fruits and vegetables. Often these seasonal tariffs were particularly high when Mexican produce was harvested, which was frustrating for its producers. The average U.S. tariff on Mexican agricultural goods was only 5 percent, though.

### **Basic Elements of the Agreement**

Canada, Mexico and the U.S. completed negotiations and released a draft accord to create a free trade area in August 1992. The document was signed by President Clinton in December 1992, but he said that he would not forward it to Congress for approval by the U.S. House of Representatives until there were side agreements on labor and the environment. These side agreements were negotiated in 1993. The NAFTA passed Congress in November 1993 and was signed by President Clinton on December 8, 1993, becoming effective January 1, 1994.

As detailed in Chapter 9, the NAFTA process allowed a discussion and resolution of environmental issues that had plagued U.S.-Mexican affairs for many years. The maquiladora program had generated increased economic activity which quickly outgrew the capacity of the border areas to handle pollution. Factories dumped toxic waste into the rivers, spewed air pollution, and fouled all areas of the border. Uncontrolled industrial growth, undeveloped infrastructure to handle pollution, a lack of enforcement of environmental regulations, and the like, had turned the border into a pollution nightmare (Runge).

The 1983 LaPaz agreement between the U.S. and Mexico on Cooperation for the Protection and Improvement of the Environment in the Border Area instituted many regulations that were not followed, including construction of waste treatment plants, planning for hazardous waste spills, and air emission programs (Runge). One requirement was that imported toxic chemicals used in maquiladora production be exported back to the country of origin as toxic waste. This lack of enforcement was very disconcerting to the U.S. environmental community, and these concerns have entered into their position on NAFTA issues.

Mexico unilaterally attacked some of its environmental problems through enactment of the General Law for Ecological Equilibrium and Environmental Protection in 1988, which was modeled on U.S. law. The law requires companies to file plans and environmental impact assessments for any new construction and plant changes. A further agreement for the border areas resulted in the Integrated Environmental Plan for the Mexico-U.S. Border Region that was jointly adopted by the U.S. and Mexico in 1992. With these new environmental laws and agreements, there was increased enforcement: some factories were closed and others were forced to reduce emissions by 70 percent (Runge). But there was still a question by many in the U.S. whether Mexican authorities were truly committed to pollution reduction and enforcement of Mexican laws.

During 1993, the U.S. and Mexico took time to discuss environmental issues associated with NAFTA and develop a strategy to attack the problems. The result was a side agreement on the environment called the North American Agreement on Environmental Cooperation (NAAEC). The U.S. and Mexico also agreed to establish a Border Environmental Cooperation Commission.

The NAFTA addresses three components relative to the environment: pollution havens; human, animal and plant health and safety; and international environmental agreements (Ballenger and Krissoff). With respect to pollution havens, NAFTA renounces the relaxation of environmental standards and establishes compulsory consultations among the member countries when relaxation occurs. Sanitary and phytosanitary provisions encourage members to use international standards, but countries can enact more stringent standards if such standards are scientifically backed. Countries should consider risk assessment, production methods and practices, scientific evidence, ecological and environmental conditions, and economic conditions in their choice of standards. The NAFTA protects national commitments to international environmental agreements to guard against challenges that individual countries might make. It preserves the status quo when an international environmental agreement is involved.

The NAAEC attempts to strike a balance between environmental aims and national sovereignty in relations among the NAFTA members. It established the Commission on Environmental Cooperation (CEC), which is charged with looking at environmental issues in the region, including production processes and methods (PPMs). The NAAEC commits the countries to enforcing laws, including training inspectors,



monitoring and reporting on compliance, and using sanctions when violations occur. There is also a dispute settlement procedure in the NAAEC.

The NAFTA included a transitional phase of five to fifteen years (depending on the commodity) for trade barriers to reach zero. Most non-tariff barriers (including licensing requirements) were converted to a tariff equivalent immediately so that progress toward free trade could be monitored more easily. Tariff-rate quotas (TRQs) were established for some commodities, which allowed a certain quantity of imports at one tariff rate (often duty-free) with higher import volumes facing a higher duty rate. The higher duty rate was usually the most-favored-nation (MFN) rate.

The U.S. Trade Commission estimated that almost 54 percent of Mexican exports to the U.S. were duty free in January 1994, compared with 31 percent of U.S. exports to Mexico. The agreement called for 62 percent of Mexico exports to be duty-free after 5 years, compared with 47 percent of U.S. exports to Mexico. Only 1 percent of U.S. and Mexican imports were to be included in the fifteen year liberalization plan. These were the most contentious products in the negotiations and many of them were agricultural goods (corn and beans on the Mexican side and orange juice on the U.S. side).

Both the U.S. and Mexico have continued unilateral agricultural policy changes that have brought their agricultural sectors into a market-oriented situation. The PROCAMPO program in Mexico, which was announced in 1993 and became fully effective in 1995, substituted direct payments to agricultural producers based on acreage for input and commodity subsidies. Before 1995, Mexican agricultural producers had substantial subsidies for credit, irrigation, and fertilizer. The U.S. agricultural policy system was revamped under the Federal Agriculture Improvements and Reform (FAIR) Act of 1996, as discussed earlier. Yet in recent years, the U.S. has gone back to more output-distorting agricultural policies. In contrast, Mexico has not reverted back to previous output-distorting policies.

The NAFTA and the unilateral policy changes in Mexico and the U.S. were supposed to provide a tremendous boost to trade between the two countries. It was expected that U.S. agricultural exports to Mexico would increase markedly for many important commodities. However, this didn't happen immediately because of the peso crisis in Mexico and the subsequent economic slowdown in the country.

### **Mexico's Peso Crisis**

When Mexico opened its market to foreign capital flows, it was hopeful that it could not only attract foreign investors but also reverse the "capital flight" of previous years. The changes in investment policies, the commitment to increased economic liberalization, and the NAFTA deal helped woo foreign investors into Mexico and much of the flight capital returned.

#### *Explanation Box 7.2 Capital Flight*

*Capital flight occurs when domestic savers choose to invest their money in foreign markets because they lack confidence in their own country. This phenomenon is common in less developed countries where domestic savers fear that inflation, political upheaval, or an undeveloped legal system will cause their investments to erode in value. Thus, any savings immediately leaves the country for a safer haven.*

Mexico was in a precarious financial situation, though, in 1994 because most (67 percent) of the capital inflow into the country was in portfolio investments that could easily be withdrawn. Mexico was running a current account deficit of 7.6 percent of GDP and their foreign reserves had fallen from \$25 billion to \$6 billion in less than one year (*The Economist*). The short-term future looked even bleaker because the Mexican government had \$29 billion in short-term tesobonos bonds that were indexed to the U.S. dollar (so the government carried the exchange rate risk) and were due in 1995. President Carlos Salinas, who had championed much of the Mexican liberalization, was leaving office November 30, 1994 and his administration allowed these problems to carry forward to President Ernesto Zedillo's term of office.

With foreign exchange reserves at low levels, a huge need for money to repay the tesobonos bonds, and continued demand for spending by the government and consumers, it was clear that some action was needed. President Ernesto Zedillo announced on December 20, 1994, that the Mexican peso would be devalued by 15 percent against the U.S. dollar. This announcement generated a nearly instantaneous \$5 billion flight of capital out of Mexico. Investors had lost confidence and wanted out no matter what the cost. With low foreign exchange reserves, the Mexican government could only watch the downward spiral of its peso and stock market. The peso went from 3.5 pesos per dollar in December to 7.5 in early March. The stock market lost one-half of its value during the same period.

The U.S. arranged a \$50 billion financing package to stabilize the situation in Mexico. The Mexican government allowed interest rates to climb (they reached over 80 percent for a short time), increased the

value-added tax from 10 percent to 15 percent, and cut public spending by 10 percent (*The Economist*). All of these measures were used to cut the demand for borrowing by the government and consumers. The economic pain in Mexico was great during 1995 and early 1996, but the country returned to positive economic growth since that time.

The peso crisis had a huge impact on U.S. trade with Mexico during 1995 and 1996. U.S. agricultural exports to Mexico, which had increased by 27 percent in 1994, fell by 22 percent in 1995. Mexican agricultural exports to the U.S., which had increased by only 6 percent in 1994, increased by 32 percent in 1995. Both of these impacts in 1995 are consistent with the decreased value of the peso, which discouraged imports into Mexico and encouraged exports from Mexico. When the peso increased in value during 1996, trade with Mexico returned to a more normal course relative to 1994: U.S. agricultural exports to Mexico increased 54 percent in 1996, while Mexico's agricultural exports to the U.S. fell by 2 percent.

## NAFTA Effects

Studies have attempted to isolate the trade and welfare effects of NAFTA. For trade involving Mexico, one challenge was to capture and eliminate the effects of the Mexican peso crisis. Nelson and his associates estimated the individual commodity effects of NAFTA for Canada, Mexico, and the U.S. In aggregate, they estimated that U.S. agricultural exports are 3 percent and 7 percent higher, respectively, to Mexico and Canada because of NAFTA. They further estimated that U.S. agricultural imports are 3 percent and 5 percent higher, respectively, to Mexico and Canada because of NAFTA.

Some commodities experiencing the biggest gains from NAFTA (each was over 15 percent higher) were U.S. exports of cattle, dairy products, apples and pears to Mexico; U.S. imports of peanuts and live cattle from Mexico; U.S. exports of beef and processed tomatoes to Canada; and U.S. imports of beef from Canada. According to Nelson and his colleagues, some other products that experienced large changes in trade, such as U.S. imports of winter vegetables from Mexico, have been mostly influenced by weather patterns, the peso crisis, and technological shifts -- phenomena outside NAFTA.

Tweeten, Sharples, and Evers-Smith estimated that NAFTA increased U.S. agricultural exports to Canada by \$1.43 billion (or 25 percent) in 1995 and increased Canadian agricultural exports to the U.S. by \$1.88 billion (or 34 percent). Their study also estimated that U.S. and Canadian agricultural producers lost \$705 million and \$776 million, respectively, because of NAFTA, but U.S. and Canadian consumers gained \$961 million and \$817 million, respectively, from NAFTA. These figures generate net gains to the U.S. and Canada of \$256 million and \$36 million, respectively, after reduced tariff revenues are considered.

Much of the increase in trade with Canada because of CUSTA has been in processed food products. Heien and Sims performed an interesting analysis of how the market for U.S. wine improved in Canada because of CUSTA changes (see Case Box 7.1). Munirathinam, Reed, and Marchant estimated that free trade with Canada increased U.S. exports of many consumer-oriented products more than bulk or intermediate agricultural products. They estimated that U.S. exports of some consumer-oriented products increased from 45 percent to 88 percent because of NAFTA, whereas U.S. exports of some intermediate products and bulk products didn't increase at all, though most were in the 20 percent to 30 percent range for both types of goods. One would anticipate that CUSTA would have a larger impact on more processed food items because tariffs are generally higher for such products. Trade liberalization will have more of a price impact and more processed food products likely have a higher price elasticity of demand.

### *Case Box 7.1 U.S. Wine Exports and Liberalization under CUSTA*

*Free trade among countries can have far-reaching effects beyond zero tariffs. Heien and Sims investigated the impacts of the Canadian-U.S. free trade agreement (CUSTA) on U.S. wine exports. Before CUSTA U.S. wine exporters faced many barriers when selling in Canada. The tariff was \$0.125 per liter in 1988 (approximately 12%). Each Canadian province had a liquor control board that determined which wines were offered in the province and what the markups were on the various wines. Imported wines from the U.S. faced markups that were much higher than domestic wines (up to triple the markup). Some provinces had blending requirements which forced provincial wines to have a certain percentage of local grapes.*

*The CUSTA agreement did away with all of these discriminatory practices between domestic and imported wines over a seven year period. U.S. wine exports to Canada jumped by 126% by 1992. Heien and Sims found that only 10% of the increase in U.S. wine exports was caused by the lower tariffs. The great majority of the increase in U.S. wine exports was caused by elimination of the non-tariff barriers that had restricted access that Canadian consumers had to U.S. wines.*

The transition period for trade between the U.S. and Mexico ended on January 1, 2008. The last items to be fully liberalized were U.S. exports of corn, dry beans, and non-fat dried milk. The last items for Mexican exports were sugar, cucumbers, orange juice, and sprouting broccoli. Zahniser and Crago discuss the changes that NAFTA has brought during its first fifteen years. They argue that trade in most agricultural products is highly integrated between the three countries. The only exceptions are sugars and sweeteners, and some processed foods. Investments by multinationals in the three countries have also served to make the countries more highly integrated. U.S. agribusinesses produced \$12.4 billion in food from their Mexican affiliates in 2009 and \$24.8 billion from their Canadian affiliates (BEA).

Lambert and McKoy used a gravity model to estimate the effects that NAFTA has had on agricultural trade among the three members. They estimate that NAFTA increased agricultural trade among its members by 145% from 1995 to 2004. They also estimate trade creation benefits and they could not reject the hypothesis that there were trade creation effects from NAFTA. Grant and Lambert used a more refined approach that included a transition period for the various PTAs to develop. They found that the NAFTA agreement stimulated agricultural trade among its members by 60% after eight years and 137% after twelve years. However, they did not distinguish between trade creation and trade diversion.

### *Explanation Box 7.3 Gravity Models*

*The gravity model is commonly used in trade analyses with cross-sectional and time-series data. The premise is from physics' law of gravity that the attraction of two objects is related to their mass. For international trade, that mass is measured by the size of the economy (gross domestic product). However, there are also hindrances (or frictions) in trade, such as transportation costs and tariffs. The model is commonly used to measure effects of trade agreements, cultural similarities, disease outbreaks, embargoes, and various one-time events that might affect trade patterns between two countries.*

*Many economists have constructed theoretical models that result in a gravity specification, including Anderson (1979), Bergstrand (1985, 1989), and Anderson and Wincoop (2003). Despite the controversies associated with its theoretical basis, the gravity model has proven better predictor of international trade patterns than other models.*

*The gravity equation can be written as:*

$$X_{ijt} = e^{(\hat{\alpha}^{b,D_i})} GDP_{it}^{b_1} GDP_{jt}^{b_2} POP_{it}^{b_3} POP_{jt}^{b_4} DIS_{ij}^{b_5} v_{ijt}$$

*Where  $X_{ijt}$  is the export volume from exporting country  $i$  to importing country  $j$  at time  $t$ ;  $GDP$  is the country's gross domestic product,  $POP$  is the country's population, and  $DIS$  is the distance between the exporter and the importer (to measure friction). The  $D_i$ s are various dummy variables – identifying whether the country pair has a common language, shared border, belong to the same free trade area, and so on.  $v_{ijt}$  is an error term. If one takes the natural logarithm of the equation the model is linear and easy to estimate using common regression packages.*

The most recent analysis of PTA effects on agricultural trade is from Lin and Reed. They used an approach that allowed the effects of each PTA to vary depending on its maturity; they estimated trade creation and trade diversion effects; and they used updated statistical methods to obtain their results. They found that many PTAs had trade diversion rather than trade creation. The NAFTA agreement stood out as one where the large increase in agricultural trade among its members was diverted from non-members.

## European Union

The customs union in Europe, which is now called the European Union, was launched in March 1957 when the six members of the European Coal and Gas Community (France, West Germany, Italy, Belgium, Netherlands, and Luxembourg) signed what is now known as the Treaty of Rome. That treaty established a European Economic Community (EEC). From the beginning, the EEC had a common agricultural and transportation policy, but there was also talk of much wider integration among the members.

Over the years there has been a slow, but steady move toward not only enlarging the membership, but also making the union stronger and encompassing. There are now twenty-eight members (with a population of more than 500 million), a common currency among many of its countries (the euro), and a central bank, the European Central Bank<sup>[19]</sup>. Other nations are in various stages in the application process (candidate and potential countries).

A huge step toward a truly unified market was the Single European Act of 1987, which came to be known as EC-92 because all of the adjustments were to be completed by 1992. The Single European Act legislated the formation of a true single market with harmonized product standards, no fiscal barriers to trade, no border checks, unified technical regulations, and so on. There was quite a bit of controversy among members concerning product definitions, safety standards, and other technical considerations, but the resulting harmonization has been great for European businesses attempting to sell in all E.U. markets.

The final piece to the economic puzzle of integration was a common currency. It was long known that currency fluctuations among the member countries was a hindrance to trade, but the move toward the euro took many years<sup>[20]</sup>. It began with the Exchange Rate Mechanism (ERM) in March 1979, to which all countries belonged except Britain (which joined later). The ERM established exchange rate bans for currencies that were within 2.25 percent to 3 percent of a specified rate and countries were pledged to keep their currencies within those values. Because of speculative attacks on some currencies in the early 1990s, the ERM bands were widened to 15 percent in 1993 until the euro was instituted.

The Maastricht treaty on European Union, which came from the Maastricht summit in December 1991 and was signed in early 1992, provided the basis for monetary union. The treaty established five convergence criteria for countries to enter into the euro. They concerned government budget balance, public debt, inflation, interest rates, and exchange rate stability. The Maastricht treaty was approved by all member countries, and eleven countries joined the European Monetary Union (EMU) system on January 1, 1999<sup>[21]</sup>. Euro notes replaced all national currencies in 2002.

The E.U. has six important governmental bodies that oversee its operations: the European Council, the Council of the European Union, European Parliament, European Commission, European Court of Justice, and European Central Bank. Their operations and functions have changed over time as the membership has changed and the idea of a European union has progressed. The European Parliament, in particular, has increased its power over the years.

The European Council is the supreme decision-making body and is made up of the heads of state from each member country. It meets at least four times per year and defines the general policy direction and priorities for the EU.

The European Commission is the executive branch of the E.U. It proposes policy, drafts implementation measures, and supports legislation that is being considered by Parliament. The Commission also represents the E.U. in trade negotiation rounds. Each country has a Commission member who is appointed by the member government (subject to approval of Parliament) for four year terms, but after appointment, the Commissioners are independent of the member governments and represent the entire E.U. The Commission carries on the day-to-day business of the E.U. and is the formal initiator of all legislation. There is a commissioner responsible for various portfolios (for instance, there is an agriculture commissioner).

The European Parliament is the legislative body of the E.U. and each member represents people throughout the E.U. It has 754 members and each country has a membership based on population (Germany has the most, 99, with Britain, France, Italy at 72; Cyprus, Estonia, Luxembourg, and Malta have the least with 6). Members of the European Parliament are directly elected for five-year terms and they clearly represent E.U.-wide interests. The Parliament has always voted on the E.U. budget, but as of December 1, 2009, it has full control of the budget process. Before that date, the Parliament shared budget responsibility with the Council.

The Council of the European Union (or Council) is legally only one entity, but in reality it has many “configurations” or “formations” based on the topic, such as Agriculture, Competition, and Environment. The presidency rotates among member state representatives each six months. The Council works as the legislative counterweight to the European Parliament. There are currently ten formations of the Council and each one has

a representative from each country (usually the appropriate minister from that country). Each representative for a Council formation serves the legislative interest of his or her own country. The Council makes policies, coordinates policies among member states, and makes decisions related to treaties. Decisions are made unanimously, or by qualified majority, depending on the issue. Under the qualified majority, the larger countries have a larger share of the votes; issues pass when they receive 50% of the countries, 74% of the weighted votes, and countries accounting for 62% of the population[22].

Originally, these E.U. organizations would work in the following general way: the Commission would propose and the Council would decide, after consulting Parliament. For instance, the Commission on Agriculture would study target price rates and make a recommendation to the Council, which would decide upon the target price. However, Parliament's role has been widened over time so that its power has increased. For instance, now all Commissioners must be approved by Parliament.

The European Court of Justice interprets the Treaty of Rome and other E.U. agreements or actions in legal terms. It is composed of thirteen judges, each serving a six-year term. The Court of Justice can have cases involving member states, E.U. institutions, or individuals affected by E.U. regulations.

The infrastructure associated with the E.U. is much more comprehensive and complex than for NAFTA. This is indicative of the more encompassing integration that takes place in a CU compared with an FTA. The findings from the empirical studies on the E.U.'s effects on agricultural trade reflect this close integration. Grant and Lambert estimated that E.U. membership increased agricultural trade among members by 400%. Lambert and McKoy and Lin and Reed also found large impacts from E.U. membership. It is anticipated that the E.U. will increasingly take political stands so that the power of its member states will be enhanced. Such a complex union requires many institutions to make sure that the various functions of government are met.

The Common Agricultural Policy (CAP) is the cornerstone of agriculture in the E.U. It was one of the reasons why the six original members unified and was the only common policy among them for many years. The CAP has clearly had huge impacts on production levels, trade status, rural development, and consumer prices in the E.U. Chapter 10 explains the main aspects of the CAP and how it has changed over time. The CAP has always been the main budget item for the E.U., but as common activities expand within the Union, agriculture's role diminishes relative to other sectors.

## Summary

1. Customs unions (CUs) have no trade barriers among members and the members also have a common external tariff. Often a CU will have free movement of production factors (labor, investment capital, etc.), harmonized standards, and even a common currency (in the case of the E.U.).
2. Free trade areas (FTAs) allow the member countries to keep their own trade barriers with non-members, but there are rules of origin which keep non-member goods from being re-exported between FTA members.
3. Preferential trade agreements (PTAs) have possible trade diversion impacts. Trade diversion occurs when the PTA encourages member nations to switch imports from efficient non-member producers to member producers because of tariffs. The extent of trade diversion depends upon the final tariffs relative to their pre-PTA levels.
4. The Canada-US Trade Agreement (CUSTA) was formed on January 1, 1989 with tariffs between Canada and the U.S. falling to zero over 5 to 10 years. The negotiations were very smooth, but the effects have been significant for some agricultural products, particularly higher-valued agricultural products.
5. The North American Free Trade Agreement (NAFTA) was formed on January 1, 1994 through bilateral agreements among Canada, Mexico, and the U.S. The negotiations were much more difficult and three side agreements had to be signed prior to final enactment. The environmental side agreement established the Commission on Environmental Cooperation to ensure that environmental concerns are addressed. The agreement has a five to fifteen year transition period, and many agricultural items have tariff-rate quotas.
6. The Mexican peso crisis in late 1994 distorted NAFTA effects during the initial two years, but the crisis was resolved by 1997, thanks to U.S. financial guarantees which supported the Mexican banking sector.
7. The move toward a united Europe began in 1957 with the six-member European Economic Community. Over time, the confederation has moved to a customs union with an enlarged membership. The Single Europe Act of 1987 committed the E.U. to harmonized standards by 1992. Monetary union, and the launch of the euro, came on January 1, 1999.

## Questions

1. Should the U.S. be a member of the Trans Pacific Partnership (TPP)? Why?
2. Give examples where the NAFTA resulted in trade diversion. How would you estimate the losses from trade diversion?
3. Take one of the manufacturing plant closings in your area. To what extent was that closing because of NAFTA or another PTA? To what extent was it because of general globalization?
4. How has the entry of new countries, particularly countries from Central and Eastern Europe, influenced the E.U.'s governance and politics?
5. How has agricultural trade between the US and Mexico changed since the NAFTA? Since the CAFTA-DR agreement? Use up-to-date numbers.



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## Chapter 8

## Macroeconomic Factors and Agricultural Trade

An important concept that has been omitted from the analysis to this point is the exchange rate. All of the supply and demand curves presented thus far have, at least implicitly, been denominated in U.S. dollars. This is fine for the U.S. and can accurately portray trade between regions where there is no exchange of currencies. However, in dealing with international trade, there are usually two currencies involved, thus the exchange rate between those currencies is important.

Farmers in Argentina are interested in the peso price of their wheat, not the dollar price of their wheat. Japanese consumers who purchase apples are interested in the yen price of the apple, not the dollar price. The prices among foreign markets are related, through the exchange rate, but one must be clear that supply and demand functions in foreign countries are influenced by the appropriate currency price, not by the U.S. dollar price. The effects of the U.S. dollar on commodity trade are indirect, through the exchange rate.

This chapter covers important elements of the macro economy, mostly the exchange rate, and their influence on agriculture and agricultural trade. The effects of an exchange rate change on exports and domestic prices are covered for small and large countries. The chapter also covers how exchange rate policies and adjustments differ between fixed exchange rate and flexible exchange rate regimes. Critical linkages among the exchange rate, interest rate, and inflation rate are outlined within the flexible exchange rate system. Finally, the relationship between exchange rates and purchasing power are discussed, along with the relevance of these macroeconomic forces on agriculture.

## Effects of an Exchange Rate Change

Exchange rate determination is covered later in this chapter, but the exchange rate is a relative price that translates the value of one currency into another. It determines the purchasing power (at least for tradeable goods) of one currency versus another. Throughout this chapter and the rest of the book, the exchange rate,  $k$ , will be denominated in foreign currency units per dollar. This is the way that most exchange rates are quoted in the financial literature (e.g., 110 Japanese yen per dollar).

When the exchange rate is defined in this way,  $k$  will increase as the dollar increases (appreciates) in value because it takes more foreign currency to purchase a dollar. For example, if the Japanese yen changes from 100 yen per dollar to 110 yen per dollar, the dollar has appreciated in value. In contrast, when  $k$  decreases, the dollar is falling (depreciating) in value because it takes less foreign currency to purchase a dollar. This relationship is often difficult to understand initially, so one must be careful in talking about changes in currency values and move slowly at first -- and keep a consistent definition for the exchange rate ( $k$ ).

If there is perfect competition, no trade barriers and transportation costs are zero, then the Law of One Price will hold and the exchange rate will perfectly transfer prices from one country to another. For instance, if a U.S. company is exporting, the price in the foreign country,  $P_f$ , will be the price in the U.S.,  $P_{us}$ , multiplied by the exchange rate:

$$P_f = P_{us} k \quad (8.1)$$

Note that the relationship is multiplicative, so that a 10 percent decrease in the exchange rate (which means the dollar has depreciated by 10 percent) will decrease the price in the foreign country by 10 percent (assuming that the U.S. price is unchanged, which is the small country assumption for the importer). Even though the dollar price has not changed, the depreciation of the dollar decreases the price of the product in the foreign market.

The fact that foreign supply and demand functions are denominated in another currency does not cause problems in the analysis until the exchange rate changes. One can think of the foreign supply and demand functions as simply multiplied by a fixed number in order to convert them into U.S. dollars. The supply and demand functions will have the same shapes when they are converted into dollars, so they can be depicted as they have been in past chapters. However, when the exchange rate changes, these curves shift because their conversion into dollars changes.

Figure 8.1 shows how a foreign supply curve is transformed into dollars so that they can be compared across countries. The left panel of figure 8.1 shows a supply curve in euros, the relevant currency for French farmers. It has a positive slope, and notice the quantity units associated with the supply curve. Assume that the exchange rate is 0.83 euros per U.S. dollar (or 1.2 U.S. dollars per euro). When the curve is transformed into U.S. dollars, only the  $y$ -axis changes, the  $x$ -axis (quantity axis) remains the same. In effect, the supply curve shifts up to reflect the fact that the euro is worth more than the U.S. dollar.

Figure 8.1 Transforming a French Supply Curve Denominated in Euros to One Denominated in Dollars

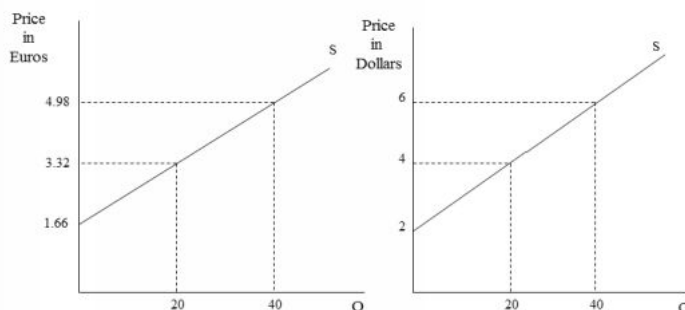
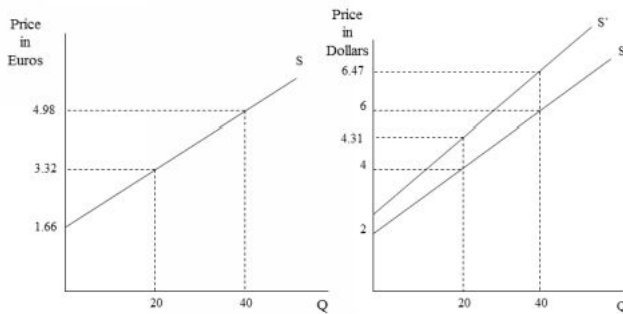


Figure 8.2 shows the impacts when the euro changes from 0.83 per dollar to 0.77 euros per dollar. Note the non-parallel upward shift in the supply curve denominated in dollars (to  $S^*$ ) if the euro appreciates to 0.77 euros per dollar. The French are only willing to supply 20 units if the price is \$4.31 ( $3.32/0.77$ ) and only willing to supply 40 units if the price is \$6.47 ( $4.98/0.77$ ). The dollar price translates into a lower euro price if

the exchange rate is 0.77 euros to the dollar, so the French supply less. If the euro lowered in value, say to a price of 0.90 euros per dollar, the supply curve would shift downward in Figure 8.2.

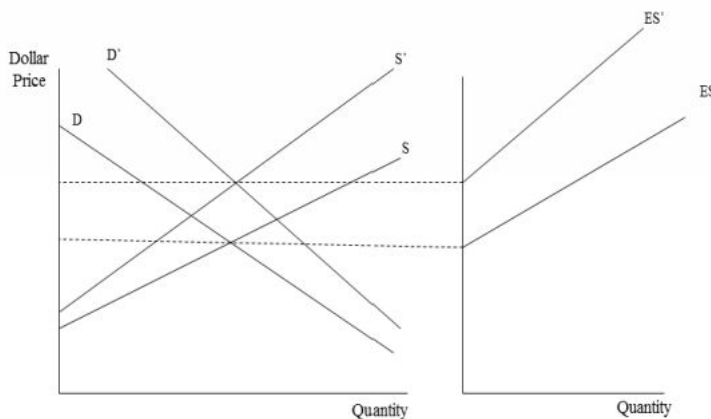
Figure 8.2 Effects of a Dollar Depreciation or Euro Appreciation on the French Supply Curve Denominated in Dollars



One can perform a similar analysis for demand curves and exchange rate changes. When the euro changes in value from 0.83:1 to 0.77:1, the French demand curve denominated in dollars will also shift upward. The appreciation in the value of the euro reduces the good's price in France and the people there naturally consume more. This graph is left to the interested reader.

The effects of a euro appreciation are shown in Figure 8.3, where the French supply and demand curves are shown in dollars. When the euro changes from 0.83 euros per dollar to 0.73 per dollar, the supply and demand curves (when denominated in dollars) shift upward to  $S'$  and  $D'$ . The supply and demand curves are unchanged when denominated in euros, but they shift when they are transformed into dollars. The upward shift in the supply and demand curves causes an upward shift in the excess supply curve (to  $ES'$ ). If France is a small country, the dollar price of the good will not change (the ED curve France faces is perfectly elastic), but French exports will decrease from  $Q_0$  to  $Q_1$ , as shown in Figure 8.4.

Figure 8.3 The Effects of a Euro Appreciation on the Excess Supply of France



Thus, when the euro appreciates, the French supply and demand curves will shift upward (relative to what they were with the previous exchange rate). The French will supply less because their price (in euros) has fallen, whereas French buyers will purchase more. The shifts will not be parallel shifts because the relationship in equation (8.1) is multiplicative: a 10 percent decrease in  $k$  (an appreciation in the value of the euro) will decrease  $P_f$  by 10 percent.

Figure 8.4 Effects of a Euro Appreciation on French Exports-Small Country

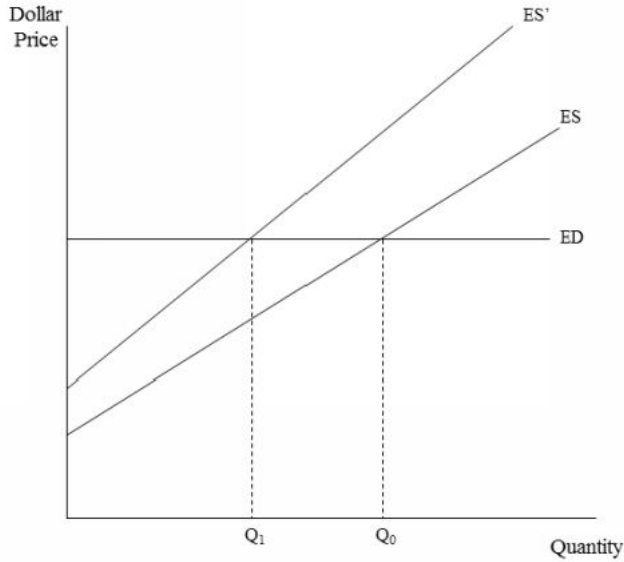
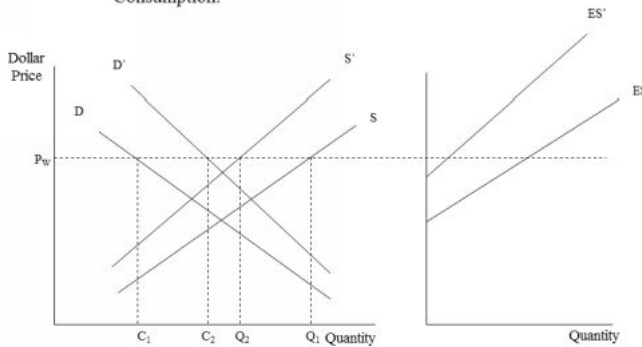


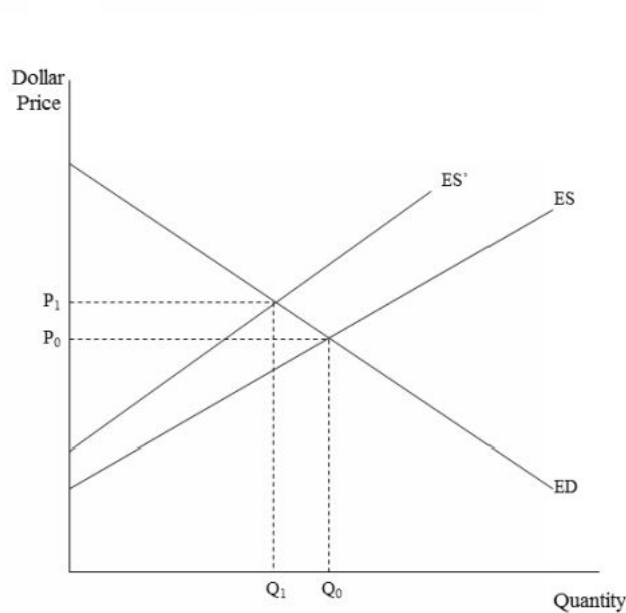
Figure 8.5 traces the effects of the exchange rate change back to the dollar-denominated supply and demand curves for France. When the exchange rate changes, the quantity supplied will fall from  $Q_1$  to  $Q_2$  and the quantity demanded will increase from  $C_1$  to  $C_2$ . Note that exports decrease from  $Q_1 - C_1$  to  $Q_2 - C_2$ . The U.S. dollar price has not changed, but the euro price has fallen, causing these changes.

Figure 8.5 The Effects of a Euro Appreciation on Production and Consumption.



If the small country assumption is relaxed, the French face a down-ward sloping excess demand for their exports. The appreciation in the euro causes a sizable decrease in world supply so the dollar price of the good must increase from  $P_0$  to  $P_1$ , as shown in Figure 8.6. The decrease in world trade is less than under the small country assumption because there is a secondary impact of being a large country. The euro price does not go down by the full amount of the exchange rate change because the world price is higher. It is clear, though, that world price increases and French exports decrease, so the ultimate euro price is lower than before the devaluation.

Figure 8.6 Effects of a Euro Appreciation on French Exports - Large Country



A similar analysis can be performed with a depreciation in the euro or an appreciation or depreciation in the value of the dollar. Note, however, that a 10% appreciation in the euro is identical to a 10% depreciation in the dollar; and a 10% depreciation in the euro is identical to a 10% appreciation in the dollar. In general, it is easier to visualize with a three-panel diagram for the country in question and the rest of the world. As an exchange rate changes, one of the panels will have its supply and demand curve shift in a non-parallel fashion to reflect the exchange rate change. Effects on that country and the rest of the world can be traced through the three panel diagrams.

Exchange rate changes clearly affect the price of tradeable goods. One can see from above that an appreciation in a country's exchange rate decreases the price of its exportable goods and it increases the price of importables for its trading partners. The appreciation in the country's exchange rate will also decrease the price of its importables and increase the price of the exportables from its trading partners (if the country whose currency depreciated is "large"). When these effects are added together, an appreciating currency will lead to lower inflation because tradeable goods decrease in price, while a depreciating currency will lead to higher inflation.

There are winners and losers to exchange rate changes for a country. When a country's currency appreciates, consumers are winners because imported goods are cheaper for them. If they travel internationally, their domestic currency will buy more foreign currency, so prices internationally will be cheaper for them. Any domestic firms that export or compete with imported goods clearly lose from an appreciated currency because the domestic prices those firms face are lower.

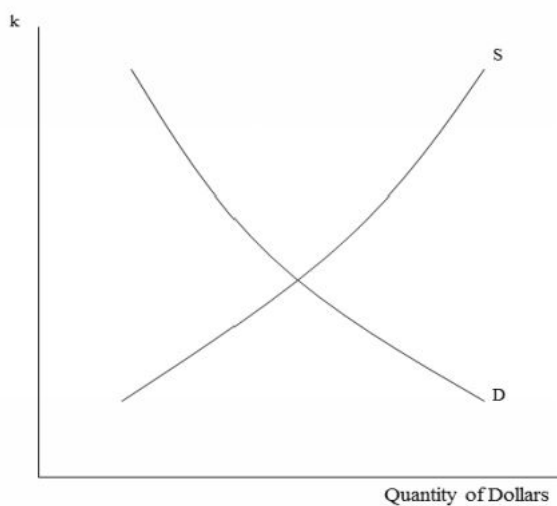
When a country's currency depreciates, consumers lose because importables and exportables are more expensive. It is also more expensive for people to travel to foreign destinations. Businesses that import goods are losers because their imports also cost more. Yet, businesses that are involved in exports or produce goods that compete with importables are clear winners. They face higher prices for their output (in the case of exporters) or face competitors that have higher costs (in the case of import-competing businesses), which is beneficial to their businesses.

In today's world, when such a large percentage of our economy depends directly or indirectly on trade, the influence of the exchange rate has heightened greatly. Yet, the ultimate determination of exchange rates is still difficult for economists to pinpoint. This has become increasingly clear over the years, with currency crises happening with increased regularity. The next section deals with factors that help determine exchange rates. The section begins with an historical perspective when exchange rates were fixed and moves to the present system, where most exchange rates are allowed to fluctuate freely.

## Determinants of Exchange Rates

An exchange rate is simply another price that must be determined within the economic system. There is a supply and demand for a currency, and the exchange rate must be related to those curves. Figure 8.7 shows a supply and demand curve for U.S. dollars. One can think of these as supply and demand curves facing the French central bank as people exchange their euros into dollars for international transactions<sup>[23]</sup>. Let us assume that there are only two countries in the world, France and the U.S., so if the French want to make an international transaction, the transaction must involve dollars. However, the French people always use their

Figure 8.7 Supply and Demand for Dollars at the French Central Bank



central bank to buy and sell their dollars.

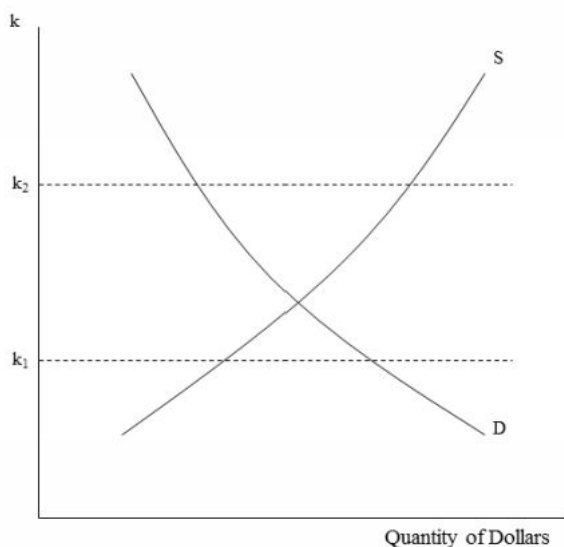
The demand for U.S. dollars comes from French people who wish to purchase U.S. goods and services or invest in U.S. assets (bonds, stocks, or fixed plant and equipment). These people go to the French central bank to obtain these dollars that they need by exchanging their euros. The supply of U.S. dollars comes from French people who have sold their goods, services or assets to Americans. These French people take the dollars they have earned to the French central bank and exchange them for euros.

The international exchange system can work in two basic ways: under fixed exchange rates or under flexible (floating) exchange rates. Each system has positive and negative aspects, but today's flexible system is the only one that can accommodate the huge daily volume of currency transactions (at least for the major developed countries). However, to better understand the concepts of exchange rate determination, it is best to begin with the fixed exchange rate system.

The Bretton Woods exchange rate system, named after a town in New Hampshire where the system agreement was signed, was the basic fixed exchange rate system which began after World War II. Here the U.S. dollar was fixed relative to the price of gold and other countries agreed to defend (peg) their currencies relative to the U.S. dollar. This is called a *gold exchange standard*, and it results in fixed exchange rates for all currencies. Each country would hold international reserves (usually in the form of gold, U.S. dollars, or other international currencies) that they would use to buy or sell their currency to keep its value fixed. The central bank in each country was charged with the responsibility of keeping the exchange rate at the announced level.

Assume that  $k_f$  is the fixed exchange rate between the euro and the U.S. dollar. If the supply and demand situation was as portrayed in Figure 8.8, the demand for dollars would exceed the supply. The French central bank would need to supply U.S. dollars by purchasing the euros that were offered by people. The fixed exchange rate is defended by the willingness of the central bank to supply or purchase U.S. dollars at that exchange rate. The situation in Figure 8.8 depicts a balance of payments deficit because the French central bank is supplying their dollar reserves to the market. At this point, one could think of the euro as overvalued at that moment because the demand for dollars exceeded their supply (with the difference made up by the central bank buying euros).

Figure 8.8 Effects of Exchange Rate on Central Bank Reserves



There can be problems if the currency is overvalued for a long period of time because dollar reserves are limited, making a persistent overvaluation impossible unless the country borrows reserves from others (international agencies, foreign governments, etc.). When there are persistent outflows of international reserves in a fixed exchange rate system, the country is usually forced to devalue its currency (change the exchange rate to reflect more accurately the supply and demand situation).

If the fixed exchange rate was  $k_2$  instead of  $k_1$ , the French central bank would be accumulating U.S. dollars because people have received more dollars from exporting or selling their assets to Americans than is required to import goods or invest abroad. The French people want to exchange their U.S. dollars for euros and they do it at the French central bank. In this situation, France is experiencing a balance of payments surplus because the central bank is accumulating dollars. The euro is, at least temporarily, undervalued and the central bank will see its dollar reserves increasing. This temporary undervaluation of the euro does not cause problems as long as the French central bank doesn't mind accumulating international reserves.

Currency depreciations in a fixed exchange rate system normally bring about a fair degree of pain because the depreciation is usually large (10 percent or more) and is often not well anticipated. Because exporters, importers, and investors have developed business plans that incorporate the fixed exchange rate, a large change in its value can be very detrimental to profitability. So, a fixed exchange rate system is fine as long as countries have enough foreign reserves to defend their currency. However, when they run low on foreign reserves, the trauma associated with the currency depreciation can be great.

The Bretton Woods system lasted from 1945 to 1973. In the early 1970s, the stability of the system was compromised by U.S. inflation and the decline in the U.S. dollar as an international currency. The U.S. attempted to stabilize the system through devaluations in 1971 and 1973, but decided to let its currency float in late 1973 (it no longer fixed the U.S. dollar's value relative to gold). Without the U.S. dollar fixed to gold, other countries saw no purpose to fix their currencies relative to a dollar that fluctuated on a daily basis. Since 1973, the world has been off a fixed exchange rate system.

#### *Discussion Box 8.1 Basic Exchange Rate Systems*

*There are three basic exchange systems for countries in the world today – the free floating, managed floating, and pegged systems. The free floating system, which is followed by the U.S., Canada, European Union, and Japan, allows exchange rates to fluctuate freely on a daily basis. There may be some government (central bank) buying and selling of currencies, but these transactions are only occasional. The managed floating system, which was used by European Union countries leading up to the euro, is where the central bank has agreed to defend upper and lower bounds on the exchange rate. If the exchange rate hits the upper or lower bound, the central bank will engage in currency transactions to defend the currency. Pegged exchange rate systems, which are less common today than they were in the 1990s, are*

*when a country's central bank defends the currency for a fixed rate relative to some other currency (usually the U.S. dollar or the euro). Pegged systems have fixed and flexible elements to them because the country's currency is fixed relative to one currency, but fluctuates relative to all other currencies.*



## Floating Exchange Rate System

There are no balance of payments surpluses or deficits with a purely floating exchange rate because quantity demanded and quantity supplied for currencies are equated by the exchange rate. The central bank does not need to buy or sell currencies for the market to clear. However, the currency's value will fluctuate so that exporters, importers, and investors will not know what a currency's value will be at any point (with certainty). The risk associated with international transactions increases because exchange rates fluctuate, but there is less need for the country to hold large international reserves or to have large currency devaluations.

If the only need for a currency is for trading goods, understanding exchange rate fluctuations with a floating rate is relatively easy. The demand for euros would come from international customers wishing to purchase French exports, whereas the supply of euros would come from international suppliers selling products in France (French imports). The supply and demand functions for euros would be very straightforward, and adjustments in the euro would be easy to explain. If the demand for French exports exceeds the supply of French imports, then the euro's value will increase. This increase in the euro's value will make French exports more expensive and importables less expensive, but these effects are easy to document and depend on rather predictable factors such as supply and demand elasticities for goods.

The demand for currencies has never been exclusively for goods in the modern era, but historically exchange rates have been mostly influenced by trade in goods. This changed drastically in the 1970s, and since that time world currency trade has changed from a goods phenomenon to a monetary phenomenon. Most currency is traded for investment purposes, not trade purposes. The Economist (February 7, 2015) estimates that daily trade turnover is \$52 billion, but daily foreign exchange currency turnover is \$5.3 trillion. Thus, foreign exchange trading is 1,000 times the trade in goods. The huge expansion in currency futures and the increased flow of money among countries to purchase bonds, stocks, and other real assets has drastically changed the nature of currency markets. International trade does not make currency values move, but interest rates and investment opportunities between countries do. It is estimated that the trade in currencies for investment purposes is over twenty times the trade in currencies for trade purposes.

### *Discussion Box 8.2 Balance of Trade Deficits – Politics or Economics?*

*One might wonder why there is such a fixation on the balance of trade if most currencies are demanded for investment purposes. The news media still reports the merchandise trade balance each month and insinuates that a balance of trade deficit is bad. In the current economic environment (with floating exchange rates and no balance of payments deficits), a balance of trade deficit does indicate that the country is importing more goods than it is exporting, but this should not be worrisome by itself. A balance of trade deficit is more reflective that foreigners are demanding the country's currency for investment purposes and that there is a net inflow of money into the country for investment (foreign investors are purchasing stocks, real estate, bonds, and other assets). This inflow might be because saving rates are low or because investment opportunities are great. If the capital inflows are due to a low savings rate, the country might want to take measures to increase savings. If the capital inflows are due to excellent investment opportunities the country should be pleased with the trade deficit.*

In an environment where currency values are determined by investment flows, the interplay among interest rates, exchange rates, and inflation rates is critical. Interest rates and inflation rates are linked through the Fisher equation, where the nominal interest rate,  $i$ , is equal to the real interest rate,  $r$ , plus the expected rate of inflation,  $\Delta p$ :

$$i = r + \Delta p \quad (8.2)$$

The real rate of interest reflects the return that an investor receives for postponing consumption over some time period. The real rate is obtained by subtracting the expected rate of inflation from the nominal rate because the purchasing power of money has fallen. The real rate of interest tends to be common across countries, but inflation rates differ markedly. Thus, *countries with higher nominal interest rates should also have higher inflation rates.*

This is borne out by a simple examination of interest rates and inflation rates among countries. Table 8.1 (taken from *The Economist*) shows the relationship between interest rates and inflation rates for selected countries. Notice that the countries with a higher past inflation rate generally have a higher interest rate: interest rates in Brazil, India, and Russia are relatively high. Remember, however, that the relationship is

forward-looking: present interest rates reflect expectations of future inflation. Japan is a special case where nominal interest rates are quite low and have been for many years. The government is trying to increase inflation to stimulate the economy so the link between the interest rate and inflation seems odd at present.

**Table 8.1 Nominal Interest Rates and Inflation Rates for Selected Countries, 2013.**

Developed Countries

	i	$\Delta p$
Italy	2.4%	0.4%
Japan	0.5%	2.8%
UK	2.5%	1.7%
US	2.5%	1.9%

Less Developed Countries

	i	$\Delta p$
Brazil	11.8%	6.3%
China	3.9%	2.0%
India	8.5%	7.8%
Korea (Rep)	3.0%	1.5%
Russia	9.3%	7.5%

## Linkages between Interest Rates and Exchange Rates

Nominal interest rates among countries are linked because investors can purchase government bonds or other debt instruments for any leading developed country with relative ease. However, the exchange rate must enter the investment decision because anyone who purchases a bond outside their country must exchange currencies. If an American investor wants to purchase a French government bond, that investor must change their dollars into euros. The American would change the euros back into U.S. dollars after the bond matures (or is sold). Thus, the future change in the exchange rate between the U.S. dollar and euro will impact the American investor's true return on the French bond.

No one knows future exchange rates with certainty. However, if there is no expected change in the value of the euro relative to the dollar, the interest rate on U.S. government bonds should be identical to the interest rate on French government bonds (as long as there are identical default risks). If U.S. interest rates were higher than French interest rates (and there was no anticipated exchange rate change), then everyone would choose to invest in the U.S. to receive the higher interest rate. Any anticipated depreciation in the value of the euro should be matched by a higher interest rate on French bonds to compensate for the capital loss in the bonds value (in dollar terms). An example should help explain this situation.

Suppose an American investor had \$100,000 that she wished to invest in government bonds for a one-year period. Assume that the investor is deciding whether to purchase American or French government bonds and that the current exchange rate is 0.83 euros per dollar. Assume further that the French bonds carry an interest rate of 6% and American bonds carry a rate of 5%, both bonds mature in one year, and each bond has no default risk. The situation is depicted in Table 8.2 where the left column shows the return calculations for the American bond and the right column shows the return calculations for the French bond.

**Table 8.2 Comparing Bond Returns Between Countries.**

	bond	American French bond
Face amount		\$100,000 83,000 euros
Interest return (5%)		\$ 5,000 4,980 (6%)
Bond's value after		
	one year	\$105,000 87,980 euros

The American calculations are very straight-forward. The \$100,000 earns an interest rate of 5%, so the bond is worth \$105,000 upon maturity. The French calculations are different because the French bond is denominated in euros, so the American investor purchases a French bond worth 83,000 euros. After one year this bond is worth 87,980 euros, but the key question is, what is the bond's worth in dollars upon maturity? Without knowing the future exchange rate, there is no way to know the dollar return on the French bond with certainty.

If there is no change in the exchange rate over the year, the French bond would be worth \$106,000, resulting in a 6% return in U.S. dollars after one year. However, if the euro fell in value, the return would be less than 6%. For instance, if the euro fell to 0.90 euros per dollar, the bond would have a value of only \$97,756 at the year's end and the return would be negative. If the euro appreciated in value, the return would be above 6%. For instance, if the euro increased in value to 0.77 euros per dollar, then the bond would be worth \$114,260 after one year, generating a return of over 14.2%. Informed investors who wish to maximize their return (in dollar terms) must incorporate expected exchange rate changes into their portfolio decisions. Obviously, the decision on which bond to purchase depends crucially on what exchange rate is expected to prevail in the future. Fortunately for investors, futures markets exist for major international currencies which allow investors to hedge their transactions by "locking in" a forward exchange rate. One can purchase or sell any major currency for up to one year in the future, so the future exchange rate can be determined for investment purposes. The forward exchange rate allows investors to lock in the future exchange rate with certainty and reduce the risk associated with investment strategies.

Since American government bonds and French government bonds have identical risks, their expected returns should be identical. If investors could lock in a higher return on French government bonds, then no one would purchase American government bonds and American interest rates would be forced to rise. Likewise, if investors could lock in a higher return on American government bonds, then no one would purchase French government bonds. In equilibrium, their expected returns must be equal. This logically means that *any difference in the interest rate on different bonds (of equal risk) between countries must reflect expected changes in the exchange rate*:

$$i_{us} = i_f - e(\Delta k)$$

**(8.3)**

Equation 8.3 is called the international Fisher equation. The interest rate in the U.S.,  $i_{us}$ , is equal to the foreign interest rate,  $i_f$ , minus the expected depreciation in the foreign exchange rate (if the currency depreciates, the dollar return will be lower),  $e(\Delta k)$ . Relative to the U.S. interest rate, foreign investors make money either off the interest rate or the increase in value of the foreign currency. Therefore, a simple comparison of interest rates among countries will indicate which currencies are expected to appreciate and which are expected to depreciate in the future.

If there is a linkage between nominal interest rates and inflation for each country (Equation 8.2), and there is a linkage among countries between nominal interest rates and expected exchange rate changes (Equation 8.3), there must be a linkage between expected exchange rate changes and inflation. *Countries with high inflation rates will have currencies that are expected to depreciate (become less valuable) in the future.* This is one version of the purchasing power parity (PPP) condition: the rate of exchange rate change is equal to the difference in inflation rates between two countries. This makes sense because countries with higher inflation rates have currencies that are becoming less valuable relative to goods, so these currencies should also become less valuable relative to currencies that are more stable. Another view of Table 8.1 is that the countries with high nominal interest rates and inflation rates are the same countries where the investment community expects depreciation in the currency's value.

The relationship between interest rates, inflation rates, and exchange rates are key considerations for central bank monetary policies throughout the world. It is well-known that expansionary monetary policy in today's globally integrated financial world will ultimately increase a country's inflation rate, increase nominal interest rates, and result in currency depreciations. Thus, if a central bank wishes to keep its currency stable with low interest rates, it must fight to make sure that inflation is in check.

## Purchasing Power Parity and Overvalued Exchange Rates

Exchange rate changes, especially on a short-term basis, are brought about by monetary phenomena, but there is still much interest in the exchange rate and its impact on international trade. Many companies rely heavily on international markets for their products, and farmers in particular have products which rely on international markets for a large percentage of their output. The exchange rate might not be primarily determined by agricultural trade, but the exchange rate certainly affects agricultural trade volume and agricultural prices.

Because exchange rates are determined by monetary policy and the relationship between monetary policy and interest rates is not well-known, subject to errors and time lags, one sees exchange rates fluctuating a great deal over time. This can be disturbing because one does not know exactly what exchange rates will be in the long-term. Without such knowledge, it is difficult to make wise investment decisions that involve international trade or investment. For this reason, economists have tried to come up with longer-term theories of exchange rate determination so that one can make better decisions and can compare current exchange rates with these “long-run” exchange rates to predict longer-term currency movements. If an exchange rate is below its “long run” value, it is undervalued, and if it is above its “long run” value, it is overvalued.

The most common view of long-term currency movements is the *purchasing power parity* theorem, which was referenced earlier. This theorem has many versions, but ideas from some versions are commonly used in the business literature today. The absolute version of the PPP theory states that in the long-run, currencies will reflect their relative purchasing power among countries. If absolute PPP holds, then the cost of a basket of goods would be the same in all countries (when the prices are translated into a common currency).

Absolute PPP is related to the Law of One Price and is not generally accepted by economists. Even in a world of free trade and no transport costs, absolute PPP would not hold because not all goods are tradeable. Housing and many services, for example, are not generally traded between countries, so there is no pressure for these prices to equalize among countries (except through immigration which is quite restrictive for most countries). Despite these shortcomings, ideas associated with absolute PPP are still commonly used.

Periodically, *The Economist* will publish their “Big Mac” index to estimate whether currencies are overvalued or undervalued relative to the U.S. dollar. The magazine collects information on the price of a Big Mac sandwich from McDonalds in countries throughout the world and converts the price into U.S. dollars using the current exchange rate. If the dollar price is above the U.S. price, the currency is said to be overvalued, whereas if the dollar price is below the U.S. price, the currency is said to be undervalued. *The Economist* makes it clear that there are problems with this index, but argues that the Big Mac is a standardized product sold throughout the world, so it provides a legitimate estimate of relative currency valuations.

Despite the existence of trade barriers, non-tradeable goods, and other price rigidities among country markets, one would still expect prices to move together among countries and that prices for tradeable goods should be nearly equal if exchange rates are at free market levels. Instead of absolute PPP, though, economists are more comfortable with the relative PPP theorem, which states that currency changes between countries should reflect relative inflation rates. This is identical to the proposition espoused earlier, that countries with high inflation rates and nominal interest rates will have depreciating currencies. These relationships tend to be preserved because of portfolio investment flows among countries.

## Macroeconomic Factors and U.S. Agriculture

The value of the dollar relative to other currencies is very important for U.S. agriculture because the U.S. exports such a high percentage of its output. The prices of agricultural commodities and the volume of U.S. exports increase when the value of the dollar falls, which is certainly good for U.S. agriculture. International customers can purchase more U.S. agricultural products with the same amount of their currency as the dollar depreciates.

There are two phenomena that reduce the short-run effects of exchange rate changes. The first is the incomplete pass-through of exchange rate changes. This observation is that exchange rate changes are not always completely passed on to international markets because firms want to maintain their market share. Suppose a U.S. manufacturer produces a good with a \$10 price. If the U.S. dollar appreciates by 10%, the new international price (according to equation 8.1) should increase by 10%. However, if the manufacturer instead reduces its price below \$10 it has absorbed some of the exchange rate change; making the exchange rate pass-through incomplete. The company wants to preserve its exports/market share when the dollar goes up in value. For such a condition to exist there must be either imperfect competition on the supply side (so that firms don't need to pass their different exchange rate costs onto their customers) or there are costs involved in switching prices.

The second issue is the J-curve effect, which involves lags in supply and demand. The exchange rate change (if fully passed through) might change domestic and foreign prices immediately, but it will take time for the full supply/demand impacts to take place. This is particularly true for agricultural supply because of lags between production decisions and output. The current supply of livestock products or perennial products is influenced by prices from previous months or years, so quantity supplied or exports might not change immediately if a currency depreciates (and the country's domestic price increases). Exports might fall in value terms with currency depreciation because the international price falls while exports change little. With time, quantity supplied and exported will increase and the value of exports will increase too. This is a J-curve effect because the path of export value falls first, and then increases to well above the initial level.

### *Discussion Box 8.3 Financial Crises and U.S. Agriculture*

*The world has seen a host of international financial crises since the mid-1990s. The currency crisis in Mexico was explained in Chapter 7, and there were similar episodes in Latin America during the 1990s. Argentina and Brazil suffered from very high inflation rates throughout the 1970s and 1980s (Argentina's annual inflation rate was 800% in 1991 and Brazil's was 2669% in 1994). They decided to follow policies to reduce those inflation rates during the 1990s (Argentina in the early 1990s and Brazil in the late 1990s). In both cases, a new currency was introduced (the new peso in 1991 for Argentina and the real in 1994 for Brazil) that was fixed to the U.S. dollar. Both countries had borrowed from the international community for various purposes and continued to do so as they followed policies to lower inflation.*

*Argentina and Brazil reduced inflation to less than 10%, but suffered from high unemployment, current account deficits (when the balance of trade plus other factor payments is negative), and low economic growth. So they abandoned their peg with the dollar and their currencies fell drastically in value. The Brazilian real lost 66% of its value relative to the dollar during January 1999. This hurt Argentina's economy because its currency was fixed to the US dollar and now suddenly Brazilian goods (which competed with Argentine products in world markets) were very cheap. Argentina took loans from the IMF to help but found that they could not stem the outflow of foreign currency. Furthermore the IMF refused to lend them more money because the Argentine government did not abide by the macroeconomic policy changes that were conditions for the loan. So the Argentine government floated the peso in January 2002; it abruptly fell from 1.4 pesos per dollar to 4.0 pesos per dollar within four months.*

*Brazil was able to weather the currency storm and its GDP growth rate was negative for only one year (1998). The devaluation of the real helped increase exports but there were other sectors of the economy that were stagnant or falling for years. Yet its growth rate was below 5% for every year until 2005. Growth below 5% is far too slow for a developing country like Brazil. In the 2006-2010 period, growth improved due to higher commodity prices. Agriculture, a major exporting industry, has expanded greatly since 2000.*

*Argentina defaulted on its \$132 billion of international debt in 2001 and it still hasn't resolved its problems with some international creditors (so it cannot borrow from international banks or other financial institutions). Most of Argentina's creditors (76%) agreed to accept a 65-75% reduction in the value of their bond-holdings in exchange for paying interest on the lower debt level. Another agreement in 2010 added more creditors to those who agreed to take a capital loss on their loans to Argentina. However, about 7% of the holders have never agreed to those terms and some investors have purchased those bonds and are still holding out for principal and interest payments. An Argentine navy ship was captured and held "for ransom" by creditors in 2014 with the hopes of getting some money from the debtor nation. These issues are still outstanding.*

*The devaluation of the Argentine currency helped exporters greatly. GDP growth increased to 9% by 2003 (after falling by 4.5% in 2002 and 11% in 2003). Farmers were especially happy until the government reinstated an export tax on grains. The government's justification was that this windfall of profits should go to the government and taxpayers who had suffered during the crisis. The government has had increasing problems with farmers, though, because these export taxes reduce the prices they receive (as explained in chapter 4).*

*The Asian currency crisis occurred in 1997 when many countries that were growing fast and attracting foreign investment in real and portfolio form, including Indonesia, Korea, Malaysia, and Thailand, were viewed as development superstars. However, companies and governments were borrowing from the international community in U.S. dollars because interest rates were much lower there. This borrowing allowed the countries to run a large current account deficit while each country pegged their currency to the U.S. dollar. There had been warnings about how the situation in these countries was not sustainable, but they were growing so fast (the Asian miracle). Suddenly, investor sentiment changed and they began taking their short-term portfolio investments out of those countries and the run on their currencies began. The Thai baht had been around 25 per dollar but was soon 45 per dollar. Indonesia also suffered from a political crisis, so its currency went from 2,500 rupiahs per dollar to over 14,000 rupiahs per dollar by December 1997. Most firms that had borrowed money in an international currency were bankrupt.*

*These financial waves were not only felt on Wall Street, through fluctuations in stock prices, but also over time throughout U.S. agriculture because of reduced exports to these destinations. In 1996, Korea imported \$3.8 billion in U.S. agricultural products, but they imported only \$2.2 billion in 1998, a 42% drop. The drop in Malaysian imports of U.S. agricultural products from 1996 to 1998 was 54%; it was 47% in Indonesia; and it was 29% in Thailand. In total, the value of U.S. agricultural exports to these destinations declined by \$2.5 billion in those two years. The Asian financial crisis, which also affected exchange rates for countries throughout Asia and Latin America, was a major reason that U.S. agricultural exports peaked in 1996.*

*Russia faced a similar crisis in the late 1990s. Its economy was struggling in its transition from Soviet times and there was a large drop in commodity prices (particularly oil) because of the Asian financial crisis. The costs of the war in Chechnya didn't help either. The country had an established exchange rate target against the U.S. dollar between 5.3 and 7.1 rubles per dollar, but it had to be adjusted to 6.0 to 9.5 rubles per dollar in August 1998. This devaluation and other policies caused inflation to peak at 84% that year. The IMF came with a loan program but it was not enough; the peg against the US dollar was stopped in September 1998. The value of the Russian ruble fell for a while, but stronger commodity prices in the early 2000s helped the Russian economy recover.*

*The common ingredient in all of these crises was international borrowing, unsustainable domestic economic policies, and a fixed or pegged exchange rate. Relatively low interest rates in the U.S. and other developed countries, along with liberalized capital markets in the countries, encouraged international borrowings to fuel growth. Yet much of the growth was not sustained by good investments, so something had to change and that was the exchange rate in all of these situations (where the international community refuses to keep the domestic currency at its pegged level). Now all of these countries have flexible exchange rates that allow supply and demand factors to work in currency markets. Many of them also have huge levels of international reserves that can be used to move the currency if the government feels that the currency's value is too low.*

The flip side of the coin is that U.S. agriculture suffers when the value of the dollar increases relative other currencies. If the U.S. is a residual supplier, due to government storage programs or other policies, U.S.

exports can fall dramatically as the dollar's value rises. This was in evidence during the early and mid-1980s, and has also been important in recent years when many countries have experienced currency crises and steep declines in their currency values (meaning a steep increase in the dollar's value).

There is not much that U.S. agriculture can do to reduce the impacts of exchange rate changes, since exchange rate movements are virtually independent of the trade in goods. One can only hope that as the international community learns more about financial crises, good banking practices, and macroeconomic policies that the fluctuations in the exchange rate will be reduced over time.



## Summary

1. The exchange rate is the price of one currency versus another. Exporting firms like to have a lower valued currency because it makes their products less expensive for foreign buyers.
2. When the country is large, a change in the exchange rate causes a non-parallel shift in the excess demand or excess supply curve. In this case, the world price will also change due to the exchange rate change.
3. Under a fixed exchange rate regime, countries will run balance of payments surpluses or deficits, so they must hold foreign currency reserves to cover the deficits. Under a flexible exchange rate system there are no balance of payments deficits, but the exchange rate will change on a daily basis.
4. In the current environment, capital flows determine exchange rate changes, so the linkages among the exchange rate, interest rate, and inflation rate is critical. International capital movements will assure that the expected net rate of return in holding different currencies will be identical among countries of similar risks.
5. Countries with higher nominal interest rates should also have higher inflation rates. Any difference in the interest rate on different bonds (of equal risk) between countries must reflect expected changes in the exchange rate. Countries with high inflation rates will have currencies that are expected to depreciate (become less valuable) in the future. These movements in exchange rates are consistent with the purchasing power parity theory.

## Questions

1. Argentina's short-term interest rate is 7.2%, while Venezuela's is 34.5%. What can you say about macroeconomic conditions in the two countries?
2. Why is it impossible for most developed countries to follow a fixed exchange rate system in total's world economy?
3. Why would you expect the purchasing power parity to hold between two countries?
4. If you are a horse farm owner in Central Kentucky, would you want a strong or weak U.S. dollar? Why?
5. I was with an engineering professor at a bank in Kuala Lumpur in April 1997. The interest rate on savings deposits posted at the bank was 14.5%. My friend suggested that we should deposit all our money in the bank. What other information did he need to know? How would our rate of return compare with U.S. returns?

## Chapter 9 Trade and the Environment

The increased integration of the world economy through freer trade and capital flows has led to friction among countries because of differing domestic regulations. Even when border controls on capital and trade are low, differing domestic regulations can have impacts that go beyond the border of a country. Environmental regulations are a classic case of this conflict and these regulations have been a major source of discussions and conflicts since the early 1990s. Increased emphasis on domestic regulations and their impact on trade comes at a time when the attention afforded the world's environment is also increasing. The intersection of these two trends, globalization and concerns about the environment, has focused attention on their interaction.

Environmental regulations are not the only set of domestic policies that have trade consequences. Earlier chapters examined agricultural price and income policies, which were addressed through the Uruguay Round of the GATT. Examples of other domestic policies that have trade consequences include antitrust policies and labor standards, which impact the cost structures of domestic companies and, therefore, can have impacts on trade patterns. Countries have vested interests not only in their own domestic policies but also the policies of their trading partners. Increased economic integration among countries has led to conflicts on these domestic issues and a demand for more harmonization, especially concerning environmental policies.

This chapter investigates how issues associated with the environment are influencing trade discussions, negotiations, and policies. Trade and the environment is a crucial issue these days because incomes are higher and there is an increased demand for environmental standards as income increases [24]. There are also many examples where parts of the earth have passed their ability to assimilate and process pollution. The horrible effects of what environmental degradation can do to an economy are seen in chemical runoff in the Former Soviet Union, smog in Beijing, the hole in the ozone layer, and the like. These and other examples have shown that it is possible to damage severely the environment, cause tremendous human suffering, and increase the long-term risk of diseases.

### *Explanation Box 9.1 The Relationship Between Income and Pollution*

*Grossman and Krueger found that there is an inverted U-shaped relationship between income and pollution that peaks at an income level of \$5,000 per capita. Thus, for countries with a per capita income above \$5,000, increased incomes will increase the demand for environmental services. This is a common finding by researchers, though there is much debate on the exact income level associated with the pollution peak.*

The discussion here focuses on the conflict between the free trade community and those concerned with the world's environment, how this conflict integrates into the WTO, what economic analysis can say about trade and environmental issues, how these conflicts were handled during the NAFTA and Uruguay Round negotiations, and finally how the conflict between trade and the environment can be resolved in the future.

Environmental externalities exist because private consumption or production has external effects on others (e.g., when a plant discharges polluted water as part of its production process). In this case, private costs or benefits are different than social costs or benefits, and there are spillover effects on society. One can categorize three forms of environmental externalities: local, transnational, and global. Local externalities only affect the country where the production or consumption takes place, and one typically allows the country in question to resolve these problems. Transnational externalities happen when production or consumption in one country has spillover effects into a bordering country. Polluted water might ultimately enter a foreign country, and so some of the social costs associated with the pollution are borne by another country. Global externalities happen when production or consumption in one country has spillover effects on all other countries. An example would be using chlorofluorocarbons (CFCs) that are known to destroy the ozone layer of the earth's atmosphere or carbon emissions that lead to global warming.

There are a number of multilateral agreements dealing with environmental issues that have trade consequences. The first one was the Convention Relative to the Preservation of Fauna and Flora in their Natural State (1933), which regulated trade in natural species and trophy animals. Other well-known agreements include the International Plant Protection Agreement (1951), the Convention on International Trade in Endangered Species (1973), the Montreal Protocol on Substances that Deplete the Ozone Layer (1987), and the Convention on Biological Diversity (1992). Each of these agreements address global

environmental issues associated with production or consumption by establishing standards and policies that signatories pledge to follow. These agreements were worked out focusing on the environmental aspects of the agreement, then making sure that commercial arrangements support the agreement and protocols.

## Defining the Conflict between Trade and the Environment

There are conflicts between trade and the environment for three reasons. First, trade and trade policies impact the environment because they change production and consumption for countries. The price signals sent to producers and consumers change, and they react accordingly. Trade (and trade liberalization) allows countries to specialize in production of those products that fit its resource base. Producers might change the scale, composition, and the technology used in their production process. Trade liberalization will change not only income and consumption levels but also change production location. If the changes in consumption or production generate environmental externalities, trade itself might be viewed as leading to environmental degradation.

Some of the environmental problems associated with increased trade come about because property rights are not well-established for some natural resources. If property rights are not well established, then producer and consumer behavior is not efficient from a social point of view. Disputed, ambiguous, or non-existent property rights are a major problem throughout the world. If residents of the rainforest in Brazil view the land as theirs, then they aren't concerned that others are upset when the forest is cleared so the residents can plant crops. However, if the world views the rainforest as a vital global resource that everyone owns, then they expect rainforest residents to behave differently.

Often property rights are well-known, but very difficult to enforce. The Montreal Protocol agrees that CFCs are a detriment to the world's ozone layer. Ozone depletion will result in increased cancer incidence throughout the world. Despite their concurrence on the necessity of action, a key question is how this agreement can be enforced? An answer to many of these environmental debates is to make producer and consumer costs and benefits coincide with social costs and benefits.

A second conflict between trade and the environment comes about because environmental policies in one country can impact other countries through trade. Each country has its own unique geographic features, assimilation capacities, cultural traditions, income, and other factors. These variations make it reasonable for environmental standards to differ by country. Yet if environmental standards vary by country, this will influence the trade pattern among countries by giving a competitive advantage to firms in one country over another. Furthermore, environmentalists and import-competing businesses say that these environmental policies of individual countries can effectively be overridden by the lower standards of exporting countries if unbridled market access is allowed. They use these arguments to call for harmonized standards. Yet harmonized standards may not be economically efficient because the costs of pollution differ by location.

Often, the debate about environmental standards and regulations turns to a North (rich countries) versus South (poor countries) controversy. The North wants the South to impose tighter regulations on its firms and citizens to preserve the environment. Yet the South sees that most current environmental problems are the result of unchecked economic growth in the North. Why should the South agree to the North's environmental standards when such standards were much more lax for the North many years ago (when the North's economic status was more comparable to the South's economic status today)? The South sees this attitude, where the North wants to dictate environmental standards to the South, as eco-imperialism. The South also sees high environmental standards as a way to keep them poor by restricting their access to markets in the North. Low points out that poverty is the "most aggravating and destructive" environmental problem of all because people do not care about the environment if they are trying simply to survive.

Finally, some people feel that trade policies can force countries into discussions about environmental issues and promises on the environmental in trade agreements. There are environmental problems throughout the world, and there is no good international organization that can encourage countries to help solve problems with externalities. Environmental agreements, as referenced earlier, are available for some issues, but they are very difficult to negotiate and often their terms are "watered down" to get agreement by large numbers of countries. Trade barriers can be a way to force countries into environmental discussions because these barriers directly affect economic activity. People who argue that trade barriers can be used as a weapon feel that the WTO does not deal effectively with issues associated with the environment.

For the purposes of discussion, this chapter will divide the trade and environment conflict between two opposing camps: the free traders and the environmentalists. This is a convenient abstraction from reality because it polarizes the viewpoints but does allow discussion and analysis of the basic tenants of each side<sup>[25]</sup>. As is normally the case in such polar arguments, the truth (and solution) lies somewhere between the two poles. In fact, the term *free trader* and *environmentalist* will be used loosely in the chapter to describe a

tendency toward these polar views. This is not to confuse the reader, but simply to clarify the debate which continues to rage.

An environmentalist is one who believes that economic growth is bad because higher living standards will consume scarce natural resources and generate pollution that will reduce welfare. They suggest that, at a minimum, any increase in incomes through growth is more than overcome by pollution increases. They assert environmental spillovers are so rampant that trade liberalization should be fought because the changing pattern of production will only serve to increase environmental degradation. Further, they believe trade liberalization will provide an incentive for governments to reduce environmental standards so that they can compete (on a free-trade basis) with countries that have lower environmental standards.

Environmentalists argue that there are market and political factors that keep environmental standards low in many countries. Freer trade will put increased pressures on governments to lower environmental standards to increase their firms' competitiveness and save jobs. This will result in an endless circle of lowered environmental standards and economic well-being. As mentioned earlier, they believe trade policies are one of the few tools available to influence groups outside their country into agreements to improve the environment.

A free trader is one who views the market as the primary solution to economic questions, and the role of government is to facilitate the workings of private markets. Free traders may recognize that environmental problems exist because of externalities, but these problems are very minor and can be overlooked relative to the other economic problems of trade liberalization (or can be addressed through other means that will be discussed later). They assert that environmentalists are really disguised "protectionists" who only want to use the environment as an excuse to protect domestic industries in a global market. They believe the world trading system is already fragile because of persistent protectionism, so allowing trade barriers that compensate for differing environmental standards (or other proposals of environmentalists) will only cloud the debates -- where do environmental standards end and comparative advantage begin? Free traders assert that nations should have control over all domestic policies and regulations because nations are sovereign.

There is a clash not only in ideologies between free traders and environmentalists but also in style and cultures (Esty). Free traders are accustomed to closed-door negotiations which are very secret. Each country has winners and losers for any negotiating stance, and so the offers in any negotiations would be controversial if the positions were made public. Without closed-door negotiations, special interests would gain and consumers would lose. Further, compromise is an important ingredient in all multilateral trade negotiations because of the political realities associated with the changing pattern of production from trade liberalization.

Environmentalists prefer open debates because they believe the closed-door meetings help the large corporations, who can profit from environmental degradation. These corporations would dominate closed-door discussions and be the ultimate winners because the environment would be sacrificed. Society, which is made up of a large number of consumers, must be brought to action through demonstrations, publicity and open meetings because without mobilization of the silent majority, the people would lose out and their voice would be drowned. Compromise is not valued because there is an overarching social good being threatened.

Free traders trust the market to generate wealth because government regulations will only get in the way of creative entrepreneurs. A tax or subsidy scheme to compensate for the difference between private and social costs will encourage economically optimal reactions by consumers and producers. However, the environmentalists prefer laws that establish fixed limits on pollution or establish fixed environmental standards because putting a price on pollution (through taxes or subsidies) is unethical and distasteful. They feel taxes allow big corporations to buy their way out of their environmental degradation and paying subsidies to firms for adopting pollution-reducing technologies is unthinkable.

There are similarities, however, between free traders and environmentalists. Both argue for causes that face powerful lobbies (labor is typically against free traders and businesses are typically against environmentalists), though many businesses are normally supportive of free trade. The gainers are diverse and not well-organized, while the lobbies are often well funded and politically connected. Yet world institutions are firmly established to support the causes of freer trade, but this is not so true for the environment.

There is certainly no guarantee that opening trade will increase environmental problems or that closing trade will reduce environmental problems. Yet there is concern that countries with lower environmental standards (or lax enforcement of standards) will have a competitive advantage over countries with higher environmental standards. This has led environmentalists to call for eco-duties to compensate for differing environmental standards among countries. This would mean that a high-standard country could place a tariff on a product imported from a low-standard country to compensate for differing environmental regulations. As will be discussed later, this is not WTO-legal, but environmentalists do not particularly see the WTO as friendly towards environmental causes anyway.

There is no question that the GATT/WTO was not formulated with an environmental agenda in mind. It was instituted before the environment became a global issue, and there is no world-wide, all-encompassing environmental agency that can work in parallel with the WTO. When WTO dispute resolution panels are constituted for trade and environment issues, they neither have an environmental representative nor do they specifically address the environmental aspects of the dispute. The case is judged in its pure economic and commercial form relative to WTO articles, as will be discussed later.

As will be seen throughout the chapter, the problem with the trade-environment debate is that both sides are correct in many of their observations and tenets, but any solution to the joint problem lies somewhere in the middle of their arguments and arriving at solutions is difficult in many instances. There must be a balancing of environmental benefits with the costs in terms of trade. Cost-benefit analysis is imperative to ensure that environmental standards are not instituted that impose large costs with few benefits. Yet it is clear that the world trading system must pay closer attention to the environment. Are there ways of obtaining the same environmental benefits through measures that are less disruptive to trade?

The solutions must also protect national sovereignty and recognize situational differences among countries. Some developing countries do not have the luxury of stricter pesticide standards because they are concerned with food production and availability. The debate cannot come down to rich countries dictating policies to poorer countries or rich countries limiting access to their markets for poorer countries. There must be more cooperation. Yet some problems, particularly global environmental issues, may be best addressed through increased harmonization of standards that are enacted based on sound science and a cost-benefit evaluation.

## Examples of Conflicts that Clarify the Debate

Gruenspecht places environmental issues into five categories based on mostly geographical aspects of the issue:

1. Domestic
2. Transboundary
3. Common property rights
4. Offshore
5. Global

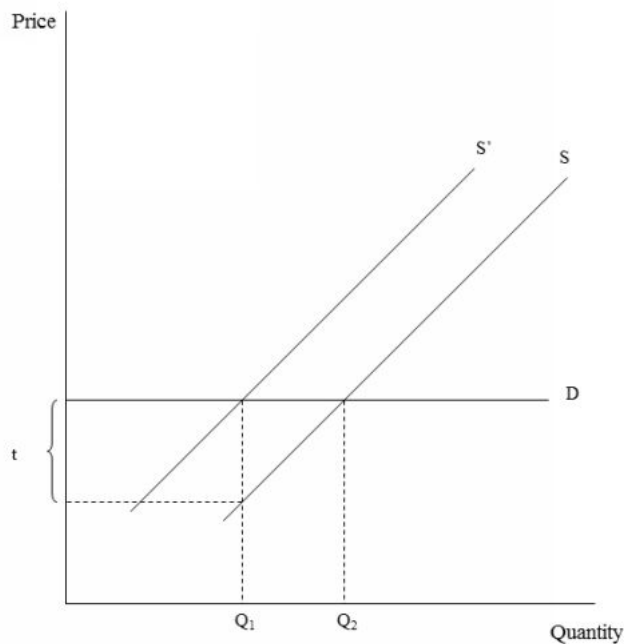
Domestic issues are the easiest in some ways because all of the differences between private and social costs/benefits are experienced within the country where the environmental problem takes place. There are many examples of domestic environmental issues: water and air pollution, congestion, pesticide use, depletion of limited resources. Most economists would argue that taxes or subsidies that require the polluter (producer or consumer) to internalize the costs of the externality will result in an economically efficient solution.

Figure 9.1 shows a simple example where the production of a product generates a negative externality – for instance, the production process pollutes water that the plant discharges. The demand curve for the product is depicted as  $D$  (horizontal assuming that the firm is a price-taker) and the marginal cost of production for the firm is  $S$ . The marginal cost curve only depicts the private costs associated with production; it does not include the negative value of polluted water that comes from the process. When one considers the social costs of the added pollution, the  $S'$  curve is obtained. This curve lies above the  $S$  curve because of the costs associated with the polluted water that society must bear. The optimal solution for the firm is to produce at  $Q_2$  if it does not consider the externality, but a tax of  $t$  units (which forces the firm to internalize the cost of the externality) will encourage the firm to produce the socially optimal level of  $Q_1$ . This is just one of many examples where a tax system forces the firm to internalize the externality and compels the firm to produce at the economic optimum.

Transboundary issues happen when pollution is created in one country but the consequences of that pollution are felt in another country. Examples of this are acid rain, which is common in Europe and along the US/Canada border; poor air quality, which often happens along borders; and poor water quality, which is a particularly troublesome issue between the U.S. and Mexico. These issues are best worked out among the parties involved and there are rarely trade issues associated with them, unless trade sanctions are used as a mechanism to get one party to the bargaining table.



Figure 9.1 Private and Social Optimum in a Small Firm Generating Pollution



Common property rights involve resources that are shared among countries due to migratory patterns. Disputes in this area normally involve fishing or harvesting of animals that migrate among country borders. Concerns exist because large harvests by one country will impact other countries that use the common resources. Also, policies that reduce support for migratory animals may reduce their numbers and cause losses (physical or psychological) on other countries where the animals migrate. Fishing rights are a troublesome issue in this category. Water rights associated with rivers that run among many countries also commonly cause problems. Again, countries must work together to agree upon solutions to problems so that the common resource can be preserved.

Offshore issues are becoming particularly important to environmentalists these days. Such issues deal with endangered species, rainforest preservation, and resource quality issues in foreign countries. While these issues do not directly influence another country, they do impact the psychological health of citizens worldwide. Americans feel bad when low environmental standards in a country cause individual suffering. They are upset when species become extinct because of poor regulations or enforcement in a country or the rainforest is destroyed because of policies that encourage farmers to move every three years. These issues come about because people in one country care about what happens in another country. However, these are difficult issues because they relate to national sovereignty, and the problem often becomes a North-South debate, as mentioned earlier.

Global issues are problems for the entire world whose solution will require actions by a number of countries. The two best examples are global warming and the ozone layer depletion. Only through concerted efforts by many countries will the problems be solved, because the externality is generated by all countries and the accumulated harm is experienced by all. The Montreal Protocol committed signatories to a full phaseout of CFCs by 2000 for more developed countries and 2010 for less developed countries. This timetable has been slowed to reduce the burden of finding CFC substitutes, but the production of CFCs was stopped in 1996 by most signatories and the complete phaseout is now scheduled for 2030. There has been a marked improvement in ozone layers through the globe due to these policy changes. The United Nations Framework Convention on Climate Change (1992) established a context for later work on establishment of greenhouse gas emission targets and other policies that would reduce global warming. Yet the world is still grappling with the climate change issue.

*Discussion Box 9.1 The Methyl Bromide Case*

*In most instances, it is estimated that environmental regulations constitute a small percentage of the production costs for most products -- 1-2 percent (Krissoff et al.). However, the effects of banning methyl bromide (MB), a soil and product fumigant, could involve much larger losses on agriculture throughout the*

*world until a suitable substitute is found. The Montreal Protocol calls for regulation of MB use because it affects the ozone layer. In 1994, the U.S. Clean Air Act froze production and imports of MB at 1991 levels, and production and imports were to be phased out by 2001 (they still are not completely phased out as of 2015).*

*The National Agricultural Pesticide Impact Assessment Program of the U.S. Department of Agriculture estimated that a ban on MB would result in economic losses between \$1.3 and \$1.5 billion for fruits and vegetables in the 1990s. Methyl bromide is used in the U.S. to fumigate domestically-produced fruits and vegetables. It is used on imported fruits and vegetables from many parts of the world, so its banning could also severely restrict fruit and vegetable imports into the United States. Further, many U.S. fruit and vegetable exports rely on MB fumigation to meet quarantine regulations in export markets. The losses come from either increased costs for MB substitutes or losses in consumer and producer surplus due to production and consumption changes.*

*The MB ban is an example of a regulation on a production process that affects trade. Generally, this is not allowed under WTO rules unless it deals specifically with protection of human, animal or plant life. In this case, since MB has been found to be detrimental to the ozone layer, and the ozone layer protects humans from the sun's ultraviolet light, this ban would likely be upheld under WTO scrutiny. Further, the WTO normally allows international environmental agreements to supersede them, but the role of the WTO is another important issue between environmentalists and free traders. The next section covers WTO principles and rules, and how they relate to the trade and environment debate.*

## WTO in Relation to the Environment

The overall philosophy of the WTO is to encourage countries to participate in mutually beneficial trade. Often, the trade and environment debate focuses on means to force countries into policies or procedures that may not be viewed as beneficial to them. This certainly is the case when the international community wants a country to produce goods using a particular production process. Further, forcing a country to increase its environmental standards might entail trade-offs that the country feels will lower its welfare. Therefore, there is a natural reluctance for the WTO to become embroiled in issues of environmental standards and processes because countries differ in their ideas on what is correct for their own circumstances.

In this context, the main principle of the WTO which applies to the environment is the “national treatment” philosophy: imports should be treated in the same way as domestic production. Countries are free to choose their own policies, but they cannot discriminate against imports. Article 20 of the WTO/GATT is not inconsistent with countries establishing their own policies to preserve natural resources and the environment. However, they cannot treat imported and domestic items differently. This would mean that a tax on imported oil would not be a legitimate weapon to combat air pollution from cars. Such a tax is not consistent with national treatment because the tax does not accrue to domestic oil producers. A pure tax on gasoline would be consistent with national treatment because there is no discrimination based on the oil’s source.

Article 20 of the WTO/GATT accord allows exceptions when countries have trade policies that are “consistent with national environmental policies which are necessary to protect human, animal, or plant life or health.” This exception, though, seems to indicate that there is some intrinsic difference between the domestic product and the imported product, or else the domestic product would also be harmful. The “necessary” element of the WTO/GATT article is also subject to interpretation. WTO dispute resolution panels have tended to view the term *necessary* to mean that there is no “less GATT-inconsistent” or less trade restricting policy available to meet the objective.

### *Discussion Box 9.2 The Tuna-Dolphin Case*

*The tuna-dolphin dispute between the United States and Mexico is a good case that highlights the concerns of environmentalists, free traders, the WTO, and the use of trade sanctions for an environmental goal. Gruenspecht would classify this as an off-shore conflict. The U.S. Marine Mammal Protection Act (MMPA) was passed in 1972 to curtail the incidental killing of mammals by commercial fishermen. The MMPA required the U.S. Secretary of Commerce to take actions to prevent the killing of marine animals by fishermen and to prohibit imports of fish products from offending countries. The main focus of the MMPA was the killing of dolphins when fishermen caught tuna using purse seine nets.*

*By the late 1980s, U.S. fishing methods had changed, so U.S. fishermen had overcome problems with catching tuna in their nets (and were fishing in areas not frequented by dolphins), but this was not the case with Mexican fishermen, who still killed dolphins while fishing for tuna. An American-based environmental group brought a suit to force the U.S. government to begin following the MMPA, and a U.S. federal judge ruled in the group’s favor. The U.S. government decided to ban tuna imports from Mexico, Panama, and Ecuador in September 1990 because of the incidental killing of dolphins (there were certain standards specified by the MMPA that were not being kept by these countries). This dispute was a classic case where the United States decided to enact a trade restriction based on the ideas of its people.*

*Mexico complained to the GATT because it felt it was being discriminated against. From Mexico’s viewpoint, there was no reason that they should change its efficient fishing method because the American public was psychologically attached to dolphins. Dolphins were not an endangered species and were not covered by any international agreements. A GATT panel ruled that the U.S. import ban on Mexican tuna was illegal because it discriminated against Mexican tuna products. If the U.S. chose to keep the ban, the panel argued that the U.S. should compensate Mexico.*

*One basis of the GATT panel ruling was that the United States hadn’t investigated other means of achieving the objective through less trade restricting policies. The panel felt that the United States was not being consistent in ruling that only tuna from these three countries should be banned. Further, Mexico argued that the ban was discriminating against their tuna based on the production process, which is not a legitimate reason for trade barriers according to the GATT, rather than product standards. Some observers*

*argue that the objective could be attained by labeling tuna that is obtained in a way that is safe for dolphins (dolphin-safe tuna).*

*The environmental community was very upset with the GATT panel because it did not consider the legitimacy of the fundamental issue: dolphins were being killed by Mexican fishermen and the United States wanted to do whatever it could to stop it. The ruling seemed to indicate that the U.S. couldn't protect the health and safety of animals outside its jurisdictional boundaries, which environmentalists thought was too constraining. Many felt that the GATT panel's decision indicated that trade issues were somehow more important or on a "higher plane" than environmental issues. It should be noted, however, that the GATT has never adopted the panel's ruling, so the case has not changed policies at all. Yet the U.S. government allows canned tuna manufacturers to identify their product as "dolphin-safe."*

This interpretation causes problems with some environmentalists because there is always a less trade-restrictive policy that could meet the same objectives, but it might be very difficult or impossible to use. For instance, in the tuna-dolphin case, free traders argue that labeling tuna as "dolphin-safe" is less trade restricting and will meet the objectives of killing fewer dolphins. But environmentalists wonder how one could police "dolphin-safe" labels<sup>[26]</sup>.

Article 20 of the GATT also allows for trade policies relating to preservation of exhaustible natural resources if these policies are associated with reduced domestic production or consumption. That is, the trade policy must be supported by domestic policies to preserve the natural resource. One cannot have a policy to ban trade in a pesticide if the country produces it. Trade policies that preserve endangered species, such as sea turtles, often use the idea that they are an exhaustible resource. It is not clear how the WTO would rule on such policies if a dispute developed.

One could argue the difference between the domestic and imported product could stem from the production process used, but the WTO does not recognize production process as a legitimate reason for trade barriers, despite the cry of environmentalists. Production processes and methods are strictly domestic matters and are totally determined by the country. However, Esty argues that it is the failure of the WTO/GATT to distinguish between product standards (which are WTO-legitimate differences) and production processes (which are not WTO-legitimate differences) that causes the problem. Semiconductors can be produced through a process that uses CFCs. It is the act of using CFCs that is the problem with some semiconductor producers, not any characteristic of the final product. Unless this distinction is allowed in the WTO, he feels that the environmentalists will always be frustrated and the WTO will be less helpful with environmental issues.

It is interesting, though, that the WTO does allow products to be distinguished by the production process for intellectual property (e.g., one cannot simply reproduce a copyright-protected property and export it). However, what constitutes a legitimate or "good" process from a poor one is readily agreed upon by the WTO membership in the case of intellectual property.

Bhagwati argues that there are three key WTO/GATT principles that relate to the environment. The first is that any WTO member should be able to clarify the true intent of a trade barrier. The WTO dispute resolution mechanism should find out whether the trade barrier or regulation has an environmental or social objective, or whether it is only a means of protecting domestic producers. Secondly, meeting environmental or social objectives must be done in the least trade-disruptive way. Finally, there must be a scientific test of the propositions implicit in the trade barriers. There should be a sound, scientific basis for the alleged connection between the trade barrier or regulation and the desired outcome.

Environmentalists are upset with the WTO because they don't think it upholds any of their principles. Free traders say that the WTO is their institution and it has enough problems within its current mandate (note the difficulty in finalizing the Doha round). Adding environmental issues to the WTO, especially to difficult issues such as differing environmental standards by country, will only make the WTO more controversial and weak.



## Economic Principles in the Trade and Environment Debate

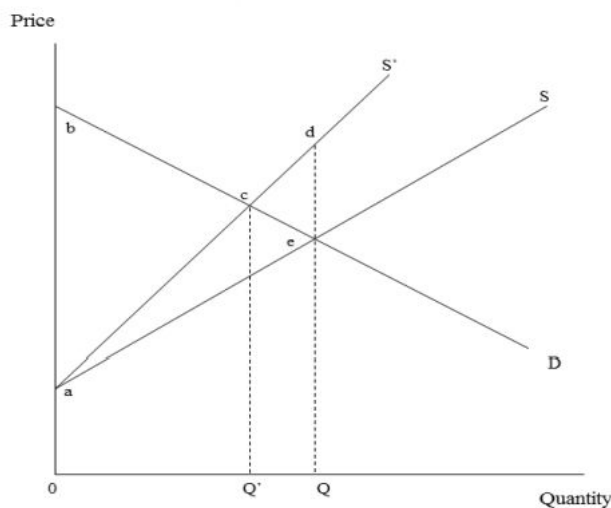
There are a number of economic principles that can be brought to the trade and environment debate. Anderson (1992a) provides a good summary. It should be noted from the beginning that most economists would lean toward the free trader viewpoint, though they would realize that environmental degradation entails costs that must be factored into any decision-making rules, regulations, and policies. One of the key questions that must be resolved from an economic perspective is, Where the property rights reside? The generally accepted principle with respect to pollution is that polluters should pay, meaning that property rights (the right of a clean environment) lie with the public [27]. In this instance, the polluter is responsible for paying the damages associated with the externality. This is a basic concept that this section will use, but one must acknowledge that in many instances the damages are very hard to measure and it is difficult to get the polluter to pay.

### Economics of a Production Externality

When the principle that the polluter pays is adopted, the economic solution to negative externalities is that marginal social benefit will equal marginal social costs because the polluter must incorporate the costs of environmental degradation into production and consumption decisions. The effects of this were shown in Figure 9.1 for a very simple example when there was no trade, the polluting firm was a price taker, and a tax was imposed to capture the pollution cost. This analysis is extended here to a countrywide situation where firms generate a negative externality as part of the production process. The welfare effects of this situation will be evaluated for no-trade and trade situations.

Assume that the private cost function (supply curve) for the good is  $S$  (the sum of all firm marginal cost curves), but the marginal social cost function is  $S'$ , with the difference being marginal pollution costs (as shown in Figure 9.2). The domestic demand function (reflecting marginal private benefits from consumption) is  $D$ . If there is no trade, the optimal market solution considering only private costs is to produce at  $Q$ . Social welfare is the area  $abe$  (private consumer and producer surplus) minus area  $ade$  (pollution costs). The optimal market solution from society's view comes when the producing firm is forced to internalize pollution costs (through taxes equal to  $S'$  minus  $S$ ) so firm decisions are made based on  $S'$  instead of  $S$ . In this situation, production is at  $Q'$  and social welfare is area  $abc$ . Social welfare is greater by the area  $cde$  with taxes because production (and pollution) declines to the socially optimal rate (from  $Q$  to  $Q'$ ).

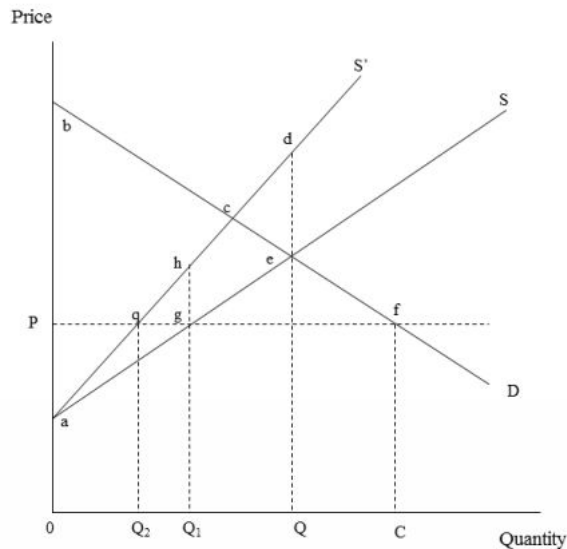
Figure 9.2 Private and Social Optimum with a Production Externality - No Trade



Assume that the country in question is small. When trade is introduced and the country is a net importer of the good (because the world price,  $P$ , is below the autarkic price), consumption will increase to  $C$  and production will fall to  $Q_1$  if pollution costs are not internalized, or to  $Q_2$  if pollution costs are internalized (Figure 9.3). The country clearly gains from trade liberalization whether or not it is producing at the social optimum. The gains from

liberalizing trade are area *defgh* if the country is producing based on private costs. These gains come about because the country gains area *degh* when it eliminates the losses due to overproduction of the polluting good, while area *efg* is consumer surplus gains (which more than compensate for producer surplus losses) from the increase in consumption levels associated with the lower world price.

Figure 9.3 Private and Social Optimum with a Production Externality - Importing Country.

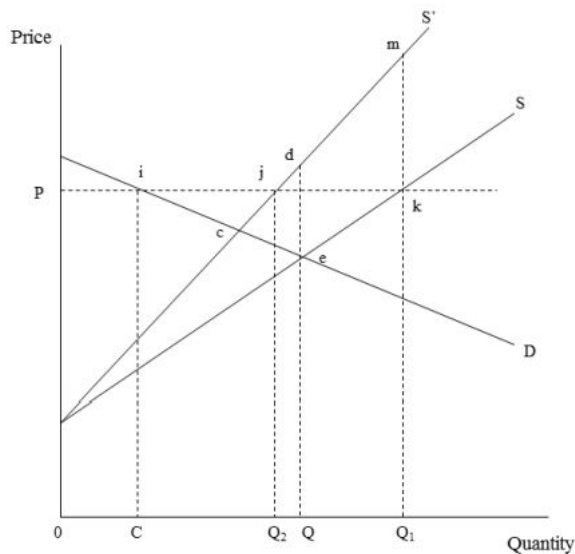


If the country is producing based on social costs, the gains from trade will be area *cfq*. All these gains come from gains in consumer surplus, which more than compensate the country for reductions in producer surplus. Notice that the welfare level with trade is higher if the country is producing based on social costs because production is much lower (the country doesn't lose area *hgq* due to pollution). Much of the gain trade with private costs comes from less pollution, while all the gains with social costs are gains from consumer surplus.

When trade is introduced and the country is a net exporter of the good (because the world price,  $P$ , is above the autarkic price), the welfare gains are less clear because increased production comes with higher pollution levels. If pollution costs are not internalized, production occurs at  $Q_1$  and consumption occurs at  $C$ , with the difference being exported to the world (Figure 9.4). The gain from trade in this case is area *eik* (which is caused by the higher world price that increases producer surplus more it reduces consumer surplus) minus area *edkm* (which is a loss because production levels are above where they would be if social costs were followed), which could be positive or negative because increased production comes with increased pollution: the net welfare impacts are unclear.

If an optimal tax is imposed on the production process (equal to  $S'$  minus  $S$ ), the country clearly gains from trade. Consumption remains at  $C$ , but production falls to the socially-optimal rate of  $Q_2$ , resulting in trade gains of area *cij* (the only change in welfare comes about because world price increases and producer surplus increase is greater than the consumer surplus loss). The difference in welfare positions with the exporting country is that pollution costs are incorporated into the decision-making process in the latter case, so production is lower.

Figure 9.4 Private and Social Optimum with a Production Externality - Exporting Country



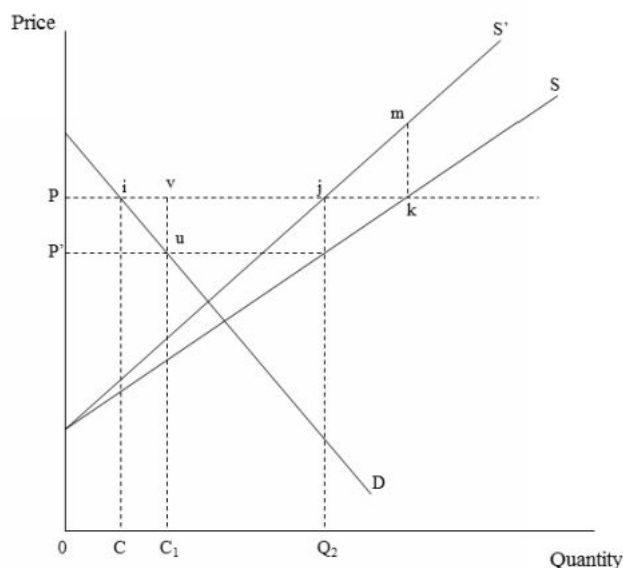
Another policy alternative is to impose an export tax on the product instead of a direct tax on pollution [28]. If an export tax ( $P - P'$ ) is imposed that results in the socially optimal level of production ( $Q_2$ ), consumption will increase to  $C_1$  because the domestic price for the good falls, and production will fall (Figure 9.5). Relative to free trade when pollution costs are not internalized, the export tax results in a gain of area  $jkm$  because production (and pollution costs) is lowered to the optimal level, but consumption losses of area  $ivu$  occur because domestic consumers are consuming more than the socially optimal amount. If area  $jkm$  is greater than area  $ivu$ , then there is a welfare gain from the export tax.

The export tax case results in lower welfare because the tax is not paid on all production. The export tax accrues only to international sales, but not domestic sales. Thus, domestic consumers are consuming too much because the price they pay does not include pollution costs. The socially optimal policy is to have the price for all consumers (domestic and international) reflect pollution costs. This result is reflective of many propositions relative to international trade and government policy: it is always best to target the policy to the problem; otherwise the policy is suboptimal. In this case, the problem is that production causes pollution, so the policy should focus on the production process, not the trade process.

If one considers the case where the country is large and therefore its production and consumption patterns influence world prices, the key findings above still hold. If the country is an importer, it will gain from liberalized trade because of the normal trade gains, plus it will gain because its production falls and less pollution results. If the country is an exporter, the key finding that a pollution tax on production is best remains, but if such a tax is not imposed, whether there are gains from trade hinges on the difference between private and social costs in the production process. Exporters will be more likely to lose from trade liberalization as the divergence increases.



Figure 9.5 Export Tax versus Production Tax for an Exporting Country with a Production Externality



Other important cases where trade impacts the environment concern offshore and global issues such as endangered species or ozone depletion. The concepts used above are still valid, but the interpretation of the components changes somewhat. The problem is that the difference between private and social costs for offshore and global issues is often experienced by individuals outside the producing and consuming areas. In such cases, it is difficult to agree upon the appropriate tax because the people who are most interested in the tax are neither producers nor consumers: they are outsiders. Further, there is less incentive for the country to enact and collect taxes for the environmental damage when the people who are suffering the loss are foreigners.

#### *Discussion Box 9.3 Ban on Trade in Ivory*

*Another example of environmental considerations that are affecting trade is the worldwide ban on the trade in ivory products, which was instituted under the Convention on International Trade in Endangered Species (1973). This ban was established to protect herds of elephants, rhinos, and other animals in Africa that are slaughtered for their ivory, which is demanded by East Asians who are willing to pay phenomenal prices for it. It is an interesting case where the main proponents of the ban are outside Africa (the producing area) and East Asia (the consuming area). People in the United States and Europe have a strong desire to assure animal numbers in Africa. In order to do that, they have managed to have a ban placed on ivory trade.*

*Some African nations, particularly Botswana, South Africa and other countries, have argued vehemently against the ban because they have huge populations of elephants that must be culled (to keep the herds manageable), but the countries are not allowed to sell the ivory. These countries are frustrated because they spend a lot of money on their national parks, despite having rather constrained government budgets, but they are denied a large income source (from ivory sales). They agree that there are problems with small herd sizes in some countries, such as Kenya and Uganda, but feel they should not suffer the costs associated with an ivory ban when their herds are beyond the carrying capacity of their lands. The CITES has allowed some small sales of elephant ivory from culled animals to enter world trade, but not much. This is an example where the marginal benefit of the resource (elephants in this case) differs markedly by location. A harmonized standard of no trade might not be the best policy.*

The concern over trade in ivory is an excellent example. Most of the benefits from restricting the trade in elephant tusks and other ivory products accrue to Americans and Europeans who are neither in producing countries nor consuming countries. If a ban is not optimal from an economic viewpoint, how could

one design a taxation plan that would move the system toward an optimum and how much should the tax be? Certainly this is a difficult if not impossible question to tackle, and its implementation would be horribly complex. The current ban might be optimal when one considers the problems in coming up with an agreement and cost of collecting any taxes.

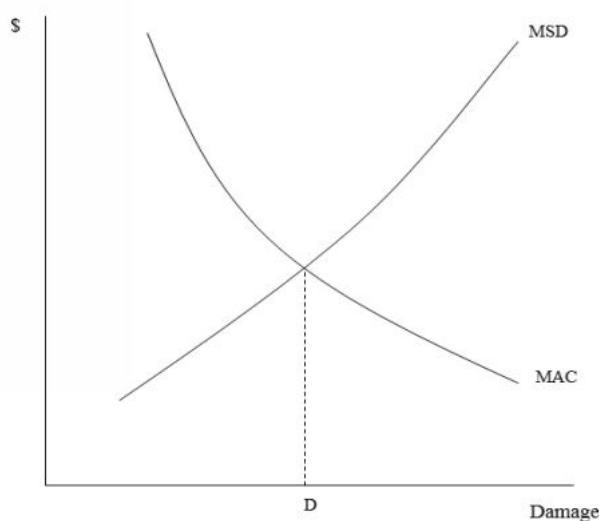
### Economics of International Standards

Production externalities are only one of many environmental conflicts in the trade and environment debate. Consumption externalities are also important, but their analysis is similar to the production externality case. However, an important consideration concerning trade and the environment is differing environmental standards by country. If environmental standards differ by country when production externalities are present, then trade patterns will be different than if environmental standards were harmonized. This result bothers many environmentalists, but differing environmental standards do not bother free traders if they are justified from an economic perspective.

Consider a situation where a production externality exists and a country wants to establish an environmental standard that is economically optimal. The standard should be set where the marginal social cost of the damage (MSD) to the environment is equal to the marginal abatement cost of pollution abatement (Pearce and Turner). The marginal social cost curve is positively sloped because as pollution increases, marginal costs of damages are high to society. The marginal abatement costs (MAC) of pollution is negatively sloped because as pollution falls, the extra cost of eliminating it increases (one eliminates pollution that is easier and less costly to remedy at first). The optimal pollution solution is shown in Figure 9.6, where  $D$  is the amount of environmental damage. A pollution level below  $D$  is inefficient because abatement costs are too high, while a pollution level above  $D$  is inefficient because damages are too high.

If one views  $D$  as the pollution standard, note that it depends on abatement costs and damages, which will vary by location. Because each country has its own unique geographic features, assimilation capacities, cultural traditions, income, and other factors, the  $MSD$  and  $MAC$  curves will vary by country and the optimal level of pollution will vary by country. Consider a situation, as depicted in Figure 9.7, where the  $MSD$  and  $MAC$  curves are different between countries 1 and 2 (the subscript identifies the country), but environmental damage is nonetheless harmonized at  $D_h$ . The standard in country one is too strict, since the optimal environmental damage is  $D_1$ , while the standard in country two is too lax, since the optimal environmental damage is  $D_2$ . The net social welfare loss from this harmonization is area  $abc$  for country 1 and area  $def$  for country 2.

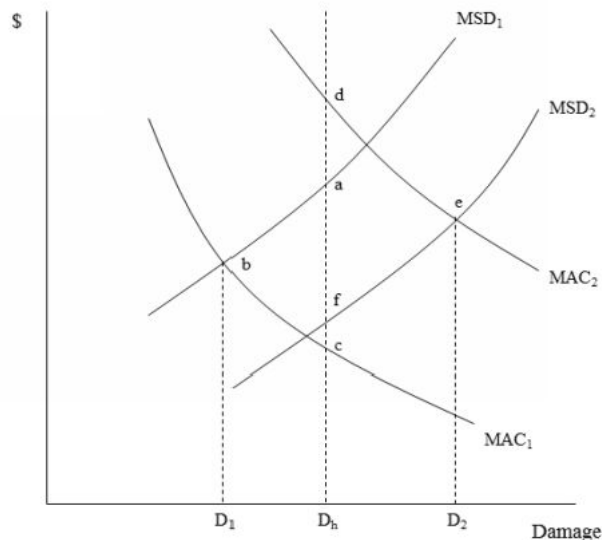
Figure 9.6 Optimal Environmental Standards



As countries develop, the  $MSD$  curve tends to shift to the left because pollution abatement has a high income elasticity of demand (World Bank). This leads to the conclusion that environmental standards will tend to increase over time as incomes grow, but it also means that there is a natural dispute between the North and

the South concerning environmental standards and harmonization (especially if the harmonization is moving towards Northern standards). The North might choose solutions like  $D_1$ , whereas the South might choose solutions like  $D_2$ . Environmentalists from the North, though, might want the South to have  $D_1$  as the standard.

Figure 9.7 Losses from Harmonized Environmental Standards



The framework used in Figures 9.6 and 9.7 can be employed to find the optimal pollution standard. As indicated earlier, environmentalists often favor policies that specify how much pollution is allowed. This comforts them because they know that only so much pollution will enter the environment and they don't feel that companies can buy their way out of pollution. However, these "command and control" systems can be difficult to enforce if pollution sources are dispersed (such as soil erosion) and their discharges cannot be easily measured or monitored. Further, this type of regulation may not provide enough incentive for innovations that will bring about pollution-saving technologies. Market-based taxes and subsidies are better in encouraging firms to innovate and generate advanced technologies that are environmentally friendly because it saves them money.

### Effects of Differing Standards

Environmentalists, who are bothered by the idea that pollution and environmental standards should differ by country, are joined in their cry for harmonized standards by more commercial-oriented special interest groups when trade is introduced. The commercial interests in high-standard countries argue that it is not fair for them to compete with companies from low-standard countries. They claim producers in low-standard countries have an unfair advantage.

There is no question that differing environmental standards will convey competitive advantages to producers in some countries over others, as do differing labor standards and anti-trust regulations. But before the economics literature on this topic is brought forth, it is useful to open one's eyes to a complete comparison of competitive conditions between countries.

The point has been made many times that less developed countries (LDCs) tend to have lower environmental standards because they are concerned with more pressing needs. Thus, there is no question that everything else equal, producers of pollution-intensive goods in LDCs will have an advantage over producers in more developed countries (MDCs). However, the assumption that everything else is equal between LDCs and MDCs is very heroic. Visualize yourself as an agricultural producer in Ecuador versus one in the United States. In Ecuador your farm may not have running water, electricity, a sewer system, telephones (though cell phones are providing a major breakthrough), access to a highway, or other infrastructure that helps reduce production and marketing costs. You may need to transport your produce by llama to a market that is one day away. As an Ecuadorian farmer, you may not have an extension service for advice, a market news service that reports prices, an experiment station that disseminates research results, a government that subsidizes crop

insurance or provides disaster assistance, and the like. For the producer in the U.S. to complain because Ecuador allows the use of a pesticide that is banned in the U.S. is short-sighted. There are too many factors that differ between the two situations to make single-item comparisons (such as pesticide regulations) legitimate.

Nonetheless, the fact that environmental standards differ by country and trade in goods is being liberalized (and the world is becoming increasingly integrated economically) raises concerns that these differences will encourage firms to move from one country to another. Copeland and Taylor have shown that with trade liberalization, pollution-intensive firms will have an economic incentive to move from high-standard countries to low-standard countries. The net effect of this movement is that pollution in the high-standard country falls because pollution-intensive firms move out, while pollution in the low-standard country increases.

The reason for the high-standard country's reduction in pollution is because firms are moving to other locations. This might be nice from the environmentalists' viewpoint (unless they are equally concerned by pollution in low-standard countries), but economic development officials are crushed by the job losses from firm exits. The natural tendency is for the high-standard country to do anything possible to keep firms from departing. This might involve tax incentives, job training programs, or reductions in environmental standards; it is the latter that makes environmentalists uneasy. They see a natural tendency for countries to begin a competition based on low environmental standards to save jobs and government incentives. There is not much empirical evidence that standards have been lowered over time by high-standard countries, but Molina has found that there is a tendency for high-pollution (water and solid-waste) food processing companies to move to Mexico.

## Environmental Consequences of Trade Liberalization in Agriculture

Some environmentalists were concerned during the Uruguay Round of the GATT negotiations that freer trade in agricultural products would encourage movement of agricultural production to countries with low standards for pesticides, herbicides and other chemicals, and that the production would take place on fragile soils that are easily eroded. Anderson (1992b) makes the argument that freer trade in agriculture would not only generate large gains from trade, but also result in a tremendous reduction in environmental degradation.

Tyers and Anderson estimated the impacts of complete trade liberalization in agriculture. They found that production would move from fertilizer- and pesticide-intensive countries (such as the European Union, Japan, and Korea) to countries that are less intensive users of these land-substituting inputs (such countries as Argentina, Australia, Brazil, and even the US). Anderson (1992b) argues that complete liberalization would also result in less intensive feeding of livestock (more pasture systems would be used, as is done in Argentina, Australia, and New Zealand) and less grain production. These types of gains would still come from such an agreement today.

Table 9.1 gives fertilizer use for various countries of the world. The countries with the most protected agricultural sectors (West European countries, Japan, and Korea) also have the highest level of chemical use [29]. Thus, when trade is liberalized, these countries will produce less agricultural output and there will be a world-wide reduction in fertilizer and pesticide use. This difference in fertilizer use was more striking in the 1990s, but lower commodity prices in the protected agricultural countries and environmental concerns have reduced fertilizer use in Western Europe and Japan. Anderson further argues that increasing production in LDCs (which the environmentalists fear) will not have much impact on the environment because the alternative employment for people is a job in an equally-polluting manufacturing job. The alternative employment for farmers in the MDCs is a service job, which results in minimal environmental degradation.

Anderson (1992b) makes the point that domestic policies can have tremendous environmental consequences too. High support prices for grains and other agricultural products are bid into the price of land, making land more expensive relative to chemical inputs. The natural consequence in much of MDC agriculture is to apply large amounts of fertilizers, herbicides, and pesticides to obtain more output per acre. These decisions have environmental consequences, but environmentalists haven't been convinced that trade liberalization in agriculture will improve the environment.

**Table 9.1 Nitrogen and Phosphorus Use for Selected Countries, kilograms per hectare in 2010.**

### Countries that would reduce production with trade liberalization

Denmark	86
France	121
Germany	172
Ireland	464
Italy	71
Japan	192
Korea	205
Netherlands	227
Switzerland	156
United Kingdom	203

### Countries that would increase production with trade liberalization

Argentina	38
Australia	51
Brazil	81
Canada	54
United States	95

Source: Food and Agriculture Organization of the U.N.

## Environmental Aspects of the NAFTA

Environmental issues and their relevance to liberalized trade came to prominence during the NAFTA debate – the first time a free trade agreement was negotiated between an MDC (the US) and an LDC (Mexico). Environmental problems associated with the maquiladora program became prominent during the NAFTA debate, and there was a fear that Mexico would become a pollution haven where companies (and jobs) would flock. The U.S. and Mexico decided to head off some of these criticisms of possible free trade impacts by negotiating a side agreement on the environment in 1993. This side agreement allowed US-Mexico border issues to be discussed and solutions put forward that would not have happened otherwise. The border, which had suffered from uncontrolled industrial growth, undeveloped environmental infrastructure, lax enforcement of environmental regulations, and the like, had turned into a cesspool (Runge).

The maquiladora program, which began in 1965, allowed companies to have facilities on both sides of the border with duty-free flow of goods between facilities. This was a great boom to both sides of the border. The number of plants along the border grew at a 20% annual rate before the NAFTA agreement, generating income increases and many jobs. However, companies dumped toxic waste into rivers, spewed air pollution, and presented other environmental problems that made the program controversial.

The 1983 LaPaz agreement between the U.S. and Mexico on Cooperation for the Protection and Improvement of the Environment in the Border Area had many regulations that addressed these problems, but the 1983 agreement, which called for construction of waste treatment plants, planning for hazardous waste spills, air emission programs, and so forth, had not been kept. Among the regulations was the requirement that imported toxic chemicals used in maquiladora production should be exported back to the country of origin as toxic waste (Runge). There was a fear that if the LaPaz agreement wasn't kept in 1983, little could be done to make sure that environmental aspects of the NAFTA would be upheld.

The Mexican government enacted the General Law for Ecological Equilibrium and Environmental Protection in 1988, which was modeled on U.S. law. Under the law, companies were required to file plans and environmental impact assessments for any new construction and plant changes. Another environmental agreement, the Integrated Environmental Plan for the Mexico-U.S. Border Region, was jointly adopted by the U.S. and Mexico in 1992. These laws and agreements led to an increase in enforcement of environmental laws: some factories closed and others were forced to reduce emissions by 70%. Yet, there was still a concern by environmentalists about NAFTA.

The environmental side agreement for NAFTA was the first time that environmental issues were specifically included in a free trade agreement. The main outcome of the side agreement was the establishment of a Commission on Environmental Cooperation (CEC), which monitors NAFTA implementation, provides information on compliance with domestic environmental laws, and recommends ways to improve environmental compliance. It serves as an important sounding board for trans-border environmental issues, but it must balance its oversight and enforcement mandate with independent national policies and organizations.

The CEC monitors and investigates whether trade flows have led to increased environmental degradation. It also looks at such environmental issues as production processes and methods, which are important for agriculture because pesticide residue standards are different between the U.S. and Mexico (Runge). To date, studies have found that environmental control costs are too low to be a major factor influencing firm movement toward Mexico (Runge). Molina's study in agriculture is the lone exception to this finding.

## Unilateralism versus Multilateralism

Given the success of the GATT in reducing trade barriers since 1948, it would be nice if environmental issues could be solved through multilateral action so that all countries could agree upon the problems and solutions. However, this doesn't seem to happen in most instances. Multilateral environmental agreements that include standards and policies are often difficult to negotiate, and enforcement is also a problem.

Blackhurst and Subramanian made an interesting observation when they said that it took 70 years for countries to negotiate and settle agreements on health and contagious diseases, even though all parties recognized the problems for a long time. With environmental issues, there is a great deal of debate on the causes and cures (as was the case with the health debates), but there is also much debate on whether a problem exists. Suffice it to say that multilateral agreements on the environment are difficult and the negotiation process is arduous.

Despite the difficulties and time-consuming nature of multilateral agreement on environmental issues, there are successful examples. One of the most important is the Montreal Protocol on Substances that Deplete the Ozone Layer. A major part of this agreement deals with production, use and trade in chlorofluorocarbons. The agreement calls for restrictions on production and trade among signatories, and also disallows trade with countries that are not signatories to the agreement. This provision is not strictly WTO-legal (because it is not consistent with national treatment), but it persists nonetheless and has not been challenged.

Another example of multilateral action is the United Nations Conference on Environment and Development, which was held in Rio de Janeiro during June 1992. This conference resulted in Agenda 21 and the creation of the UN Commission on Sustainable Development. A number of mandates and agreements have come from these conferences and commissions which restrict their signatories from trading in certain goods or using certain production processes (Runge).

Yet, many environmentalists do not think the multilateral agreements go far enough, and they believe these types of agreements will never go far enough by their very nature. They argue that their provisions are usually very non-controversial and "watered down." The agreements are often plagued by such questions as how many countries need to sign the agreement to make it "valid" and who decides whether the countries are complying with the agreement? The biggest benefit that a multilateral agreement might convey is that it gives countries an excuse for unilateral action (particularly countries from the North). Environmentalists realize that unilateral action can be swifter and more targeted because fewer people need to agree on the action. They also feel that progressive unilateral action can lead to successful multilateral action too.

Multilateral agreements tend to suffer from a lack of participation by many countries. With respect to multilateral environmental agreements, the evidence that a problem exists may not be compelling, so some countries will not want to enter the negotiations. Some countries might accept that a problem exists, but the solution is low priority because of their preferences, incomes or resource endowments. There are simply more pressing issues for the country. Another problem is that the country may not agree with the intercountry allocation of responsibilities from the agreement. Often this debate centers on the base year when pollution standards or levels are set, which, of course, changes the required environmental adjustments by signatories. Finally, many countries will simply want to be free riders, where they stay out of the agreement (therefore suffering none of the costs), but receive the benefits of actions from countries within the agreement. This is the justification for no-trade clauses with non-signatories for some agreements.

Less developed countries are particularly less likely to become involved in agreements. Runge argues that the North should use increased access to its market as a carrot to entice them. Such a commitment would justify improved environmental standards in the South and answer the South's criticism that the North wants the South to sacrifice economic growth so that the North can enjoy a better environment. The South could trade off costs of an improved environment with increased markets in the North.

Multilateral action on environmental issues is important to environmentalists because they must combat the strong multilateral nature of the WTO. Without some means of arriving at global agreements on environmental standards, enforcement procedures, and guidelines for trade measures, unilateral measures will be hard to justify. The WTO provides the perfect forum for multilateral agreement on freer trade, but environmental agreements must come together on an issue-by-issue basis. This causes delays and inertia. The strategy of some environmentalists has been to try to destroy or weaken the GATT so that the free trade orientation of the world will be lessened. Esty argues that instead, environmentalists should use the WTO as a model for what he calls a Global Environmental Organization (GEO) that would serve a parallel role to the WTO.

The GEO would exist to provide a framework for countries to fight battles against environmental degradation. It could be a permanent, encompassing organization that focuses on environmental issues among countries, especially common property and border issues, and could even support national environmental issues. It might be similar to the CEC under the NAFTA, but the GEO's role would be broader and involve more open discussion and debate. The GEO could also fund studies that investigate norms, rules, methodologies, and relationships that are important for environmental regulations. If it had sufficient financial backing, the GEO could fund development programs to address some of the LDC environmental problems which cannot be addressed because of budget constraints.

Despite whether a GEO is established that will promote environmental debates and agreements that can provide a counterbalance (or support) to the WTO, there are special circumstances where environmental agreements must be integrated more formally into the WTO. First, what should be done when trade is restricted based on provisions of multilateral environmental agreements? Do the environmental agreements take precedent over the WTO? The Montreal Protocol prohibits signatories from importing CFCs from non-signatories. Would this withstand a WTO challenge? Generally multilateral environmental agreements have taken precedence, but there are no cases where this has been disputed.

Other potential problem cases involve unilateral action taken in support of general environmental mandates or agreements. How will WTO dispute panels handle situations where trade restrictions have been imposed on a unilateral basis to support international standards that were composed as part of an international agreement? How will WTO dispute panels rule upon trade barriers that are unilaterally imposed to address global or transboundary problems that are officially recognized by international bodies? These are crucial issues that will someday need to be resolved. The ad hoc nature of dealing with the world's environmental problems makes these very difficult to handle on a systematic, studied basis.



## Principles to Resolve the Conflict

Even though direct taxes and subsidies are the optimal economic policies to combat pollution, the political economy of the situation normally results in “command and control” types of restrictions or regulations. Further, there is often significant pressure toward the use of trade barriers to “level the playing field” with respect to environmental standards and production processes. As argued above, this leveling of the field is not efficient from an economic viewpoint because of the vastly different situations each country faces with respect to resource endowments, social preferences, and environmental conditions.

Despite these tendencies for inefficient policy design, there are some principles that can take pressure off the conflict and diminish the likelihood that a confrontation will arise. Runge suggests the following ways for balancing trade and environmental policies:

1. Use trade targets with trade instruments and environmental targets with environmental instruments. It is not good to use an instrument which controls trade (such as an import quota) for a pollution problem. It is better to use a direct tax on pollution. The more targeted environmental policies are on the environment and the more equal the trade burden, the better.
2. Trade policies should aim to reduce trade barriers while remaining environmentally neutral. There should not be a clear trade-off between benefits to trade and costs to the environment that pits one side against the other. Rather, reductions in trade barriers should occur without environmental costs.
3. Environmental policies should be environmentally beneficial while remaining trade neutral. Again, there should be no clear trade-off between benefits to the environment and costs to trade.
4. National governments should be encouraged to pursue similar trade and environmental policy objectives. This does not mean that the policies should be identical, but there should be some common agreement among nations about the types of policies that are to be enacted.

These principles are easily stated, but they are much more difficult to institute because the world is highly integrated these days. It is difficult to keep environmental problems from having trade ramifications and to keep trade liberalization from having environmental ramifications. There are two overriding areas of agreement that can help bridge the gap between environmentalists and free traders. The first is an agreement that the property right lies with a clean environment, so the polluter must pay for pollution. With agreement on this principle, the liability is clear when environmental degradation occurs. The second is the need for collective action and agreements. It would be best if this collective action was accomplished through a GEO or through a significant modification of the WTO, but neither of these is likely. Without these two alternatives, the ad hoc approach of individual international agreements will be the only course. But it is important that the WTO recognize the importance of global environmental agreements, so that the agreements can be used within the WTO framework.

## Summary

1. Environmental policies are only one set of domestic policies that have trade consequences. Other non-agricultural policies that have trade consequences include anti-trust policies and labor standards. Because of today's global economy, countries have vested interests in such policies of other countries.
2. There are conflicts between trade and the environment for three reasons. First, trade and trade policies impact the environment because they change production and consumption for countries. Second, environmental policies in one country can impact other countries through trade. Third, people feel that trade policies are a way to force countries into discussions about environmental issues and agree to environmental aspects in trade agreements.
3. Environmentalists fear that free trade will bring a downward spiral in environmental standards, but free traders worry that government regulations will get in the way of unfettered competition . There is also a large clash in style between environmentalists and free traders.
4. The most contentious environmental problems deal with common property rights, offshore issues, and global issues . In these instances, many countries must get together for solutions, but the countries have very different resource endowments and cultural traditions.
5. The WTO has not been friendly to many of the propositions of environmentalists because the WTO's philosophy is to bring countries together for mutually-beneficial trade. Article 20 of the GATT allows exceptions when countries have trade policies that are "consistent with national environmental policies which are necessary to protect human, animal, or plant life or health."
6. The economic analysis of environmental problems makes it clear that the best solution is to tackle the environmental externality directly, by taxing the polluter, rather than indirectly through trade policies. Economic analysis also shows that it is best if international standards vary by country depending on marginal social costs of damages and marginal abatement costs.
7. Anderson (1992b) estimates that complete agricultural liberalization would tremendously reduce environmental degradation because countries with high-input agriculture would also tend to reduce agricultural production due to liberalization.
8. The NAFTA was the first time a free trade agreement specifically included environmental measures and safeguards.
9. The world might benefit from establishment of a world-wide organization, similar in concept to the GATT, which would establish a mechanism for tackling environmental issues on a global scale. However, it is doubtful that countries would ever agree to establish and properly fund such an organization.

## Questions

1. Are most farmers environmentalists, free traders, or somewhere in between? Explain.
2. Should environmental regulations be standardized so that farmers throughout the world have the same regulations? Defend your answer.
3. Do less developed countries have a good point when they argue that more developed countries have become rich from environmental degradation? What countries are associated with some of the worst pollution stories?
4. Some observers say that the General Agreements on Tariffs and Trade (and the World Trade Organization) are not consistent with environmental interests . Do you agree or disagree? Why?
5. Do you think that the U.S. should invest in the establishment and operation of a Global Environmental Organization?

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## **Chapter 10                    Agriculture in the European Union**

It is important that students of international trade understand the agricultural situation throughout the world. This is the best way to comprehend world trade patterns and to have a feel for what the future will be. A full assessment of the world's agriculture is impossible in this book. As a substitute, two important areas of the world are covered that are especially important to food and agricultural trade: China and Europe. This chapter covers agriculture in Europe and serves as a model for the data and analysis that would go into assessments of other regions of the world (as does the China chapter).

European agriculture is chosen because so much of the agricultural policy debates occurring in the U.S. involve the E.U. Without an understanding of E.U. agriculture, its strong and weak points, the student of international trade negotiations will not fully understand the issues. It is also interesting to see how different policies result in a very different agricultural structure.

## Background on the European Union

As stated in Chapter 7, the European Union (E.U.) is made up of twenty-eight countries and constitutes the world's largest trading bloc. The E.U. has an area of 4.4 million square kilometers (45% of the U.S.) and a 2012 population of 508 million (60% larger than the U.S.)<sup>[30]</sup>. Its membership is likely to continue expanding in the next few years.

The E.U. is made up of well-developed, high-income countries. Its gross domestic product (GDP) in 2012 was \$ 16.58 billion, which was 5.6% above the U.S. and double China's. Prices are high in Europe, though, so when the GDP figures are adjusted for purchasing power, U.S. GDP is 5% above the E.U. Per capita GDP in the E.U. was \$35,116 compared to \$49,922 in the U.S. and \$46,726 in Japan. The per capita GDP in the E.U. has fallen in the last fifteen years because lower income countries have joined the Union. Luxembourg had the highest per capita GDP (adjusted for purchasing power) in 2012, \$79,705, followed by Austria at \$42,409, and Netherlands at \$42,194. Of the larger countries in the E.U., Germany had the highest per capita GDP (\$39,028), followed by the United Kingdom (\$36,941), and France (\$35,548).

Most countries in the E.U. have very low inflation rates (between 0% and 3%), which is similar to the U.S., but unemployment rates are much higher in most E.U. countries. The E.U. unemployment rate in 2012 was 11.1% versus 7.7% in the U.S. The unemployment rate varied tremendously among E.U. countries, from 27% in Greece and Spain, to 4.2% in Austria and 4.4% in Netherlands; Germany, the United Kingdom, and France had unemployment rates of 5.2%, 8%, and 9.6%, respectively. The E.U. continues to suffer from the financial crisis that hit the world in 2007/8 and government budget constraints have forced economic restructuring that has resulted in a weak financial system and high unemployment rates in many E.U. countries. The social systems and the structure of business taxes on employees in these countries is another reason for the high unemployment rates. However, these social systems are changing because of fiscal restraints by member governments. The taxes that businesses pay for employees are still higher in Europe and rules on shedding employees continue to be stricter. These policies make firms more reluctant to hire new workers.

Agriculture is less important in the E.U. than in the U.S. Agriculture accounting for only 1.2% of E.U. GDP in 2011, but that percentage varies widely by member country. Agriculture was 5.9% of GDP in Romania and only 0.2% of GDP in Luxembourg. Because of the population density in the E.U., which is 116 persons per square kilometer versus 34 persons per square kilometer in the U.S., agriculture is naturally less important. However, there are pockets in the E.U. where agriculture plays a paramount role.

Contrary to some opinions, the E.U.'s agricultural industry is not made up of many small-scale farmers that are inefficient producers of food. Instead it is a very diverse industry with some very efficient producers, particularly in the Netherlands, Czech Republic and parts of France and Germany, alongside smaller scale producers. Yet the E.U. has been forced to change its agricultural policies because of increased expenditures on farm subsidies and the tendency to produce more than could be sold at intervention prices. It faces the same basic agricultural problem of the U.S.: productivity increases outpace the demand for agricultural products.

This growing output from European agriculture was not a problem in 1957 when the precursor to the E.U., the European Economic Community (EEC), was first formed. At that time the seven members were net importers of most agricultural products and the customs union was natural because the surpluses of France, Netherlands, and Italy could be shipped to Germany, the industrial giant (Italy was net deficit in some temperate crops too). The Germans didn't mind supporting agricultural policies which increased farm prices as long as they had better access to export markets for industrial goods. These high farm prices could be supported through an import levy scheme that generated revenue for the EEC (see Chapter 3).

High farm prices had important long-run impacts because farmers throughout the EEC geared up production and the EEC became a net exporter of temperate foodstuffs by 1979. Turning from an importer to an exporter called for a different set of policies because high internal prices continued to be above world market levels. The EEC brought in new members, such as the United Kingdom, Spain, Portugal, and Greece during the 1970s and 1980s, but those countries increased their agricultural production too because of high EEC prices. The addition of ten countries (mostly from Eastern Europe) in 2004 and Bulgaria and Romania in 2007 have only added to the stress on the E. U.'s Common Agricultural Policy, which is discussed later in this chapter.

## E.U. Agricultural Statistics

The E.U. has 171.6 million hectares of agricultural land<sup>[31]</sup>, which includes arable land, land in permanent crops, and pasture. The large countries of the E.U. account for most of this agricultural land (Table 10.1): France (16%), Spain (14%), Germany (10%), U.K. (9%), and Poland (8%). The value of agricultural production per hectare varies widely among E.U. countries, with an average of 2,219 €/hectare (\$1,167 per acre). Netherlands has the highest productivity in the E.U. at 13,332 €/hectare, with Malta, Cyprus, Belgium, Denmark, and Italy having productivity levels above 3,500 €/hectare. Lithuania, Estonia, Bulgaria, and Latvia had productivity levels below 1,000 €/hectare.

**Table 10.1 Land in Agriculture and Value of Agricultural Production in European Union Countries, 2011.**

Ag. Land	Million Dollars	1,000 ha	Billion euros
Austria 6,777		2,878 9,420	
Belgium	10,524	1,358	7,571
Bulgaria	5,606	4,476	4,033
Cyprus 673		118 936	
Czech Rep 4,733		3,484 6,579	
Denmark	14,497	2,647	10,429
Estonia 751		941 1,043	
Finland	5,690	2,291	4,093
France 70,186		27,837 97,566	
Germany	72,492	16,704	52,149
Greece 10,310		3,478 14,332	
Hungary	10,548	4,686	7,588
Ireland 6,628		4,991 9,214	
Italy 45,980		12,856 63,917	
Latvia 1,001		1,796 1,391	
Lithuania	3,375	2,743	2,438
Luxembourg 329		131 457	
Malta 121		11 168	
Netherlands 24,958		1,872 34,694	
Poland 22,423		14,447 31,170	
Portugal	8,601	3,668	6,187

Romania	13,306	16,799
	23,352	
Slovenia	483	1,232
	1,713	
Slovakia	1,896	2,175
	3,023	
Spain	23,753	
40,197	55,878	
Sweden	3,066	5,376
	7,473	
United Kingdom	15,686	25,721
	35,755	
Total E.U.-27	171,603	
380,858	529,430	

The value of agricultural production totaled 380.9 billion euros in 2011, which is equivalent to \$529.4 billion U.S. (Eurostat data base). France leads the E.U. in value of agricultural production. In 1995 its agricultural production value reached 70.2 billion euros compared with Germany's 52.1 billion euros, Italy's 46.0 billion euros, Spain's 40.2 billion euros, and the United Kingdom's 25.7 billion euros (Table 10.1).

European Union agriculture is split between the North (France, Germany, and the UK), where temperate crop and livestock operations dominate, and the South (Italy, Greece, and Spain), where Mediterranean crops dominate. This is reflected in the commodity composition of agricultural output (Table 10.2). The leading commodities in terms of production value are cereals (54.1 billion euros), milk (52.9 billion euros), fruits and vegetables (50.7 billion euros), and hogs (34.7 billion euros). Table 10.3 shows land use by major crops. Cereals account for much of the land use, but their importance is lower in terms of production value. Wheat and barley are commonly used as livestock feed in the EU.

**Table 10.2 Value of Selected Agricultural Production for the E.U.-27 in billion euros, 2011.**

	Cereals	54.1
	Milk	52.9
	Fruits and Vegetables	50.7
	Hogs	34.7
	Other Crops	33.1
	Cattle	30.9
	Poultry and Eggs	27.0
Other Farm Products	23.9	
	Wine	14.9
Agricultural Services	58.7	

**Table 10.3 Land Use in the E.U.-27 in million hectares, 2011.**

Wheat	25.7
Barley	12.0
Wine Grapes	3.3
Corn	8.9
Sugar Beets	1.6
Oats	4.0
Rye	2.4
Rapeseed	6.7
Sunflower	4.3

Note: One hectare is equal to 2.469 acres



Table 10.4 shows total E.U. production and the production of the three-leading producers within the E.U. Production of temperate goods is dominated by the Northern countries. Either France or Germany is the leading producers of all major temperate agricultural products. The United Kingdom is also an important producer (the third-leading producer of milk and wheat). Spain is the second-leading producer of pork, Italy is the third-leading producer of beef, and Poland is the third-leading producer of cereals and sugar beets. Pork is the leading meat consumed in Europe (with 41 kg. consumed per person compared to 23 kg. of poultry and 15 kg of beef) and the E.U. exports a large quantity of pork each year. Cereals and dairy are also important industries for the E.U.

**Table 10.4 E.U. Production of Major Agricultural Products in million tons, 2011.**

Wheat	138.0	
France 36.0	Germany 22.7	
	UK 15.5	
Milk	139.3	
Germany 29.8	France 25.1	
	UK 13.8	
Cereals	288.4	
France 63.6	Germany 42.0	
	Poland 26.7	
Sugar Beets	18.5	France
5.2	Germany 4.2	Poland
		1.9
Pork	22.4	
Germany 5.6	Spain 3.5	
France 2.0		
Beef	7.8	
France 1.5	Germany 1.2	
Italy 1.0		

Yields are high in the E.U. relative to the United States. French, German, British, and E.U.-27 yields per hectare for major crops are presented in Table 10.5 with U.S. comparisons for 2011. In that year, the E.U.-27 wheat yield was more than 1.9 times the U.S. wheat yield, the E.U.-27 barley yield was 15% above the U.S. barley yield, and the E.U.-27 corn yield was 20% below the U.S. corn yield. The wheat and barley yields are very high relative to the U.S. because the winters are wet and not so cold in Europe, whereas dry land areas in the U.S. tend to plant wheat and barley because these areas cannot support other crops due to low moisture levels. Yields in the U.S. have increased relative to E.U. average yields in recent years; however, the yields in France, Germany, Netherlands, and the United Kingdom continue to outpace U.S. crop yields.

**Table 10.5 E.U. Crop Yields Versus U.S. Crop Yields in tons per hectare, 2011.**

	Wheat	Barley
Corn		
France	6.81	5.70
10.19		
Germany	7.02	5.47
10.62		
Netherlands	7.85	6.00
11.52		
United Kingdom	7.75	5.66
-----		
EU-27	5.60	4.32
7.65		
United States	2.94	3.74
9.21		

The major reason for such high E.U. crop yields is that land is scarce relative to the U.S. and land prices are high in many locations. The average arable land value in Netherlands is more than 30,000 euros per hectare (\$15,783 per acre); the average in Denmark is more than 25,000 euros per hectare (\$13,152 per acre); the average is more than 12,000 euros per hectare in England (\$6,313 per acre); while the average is only around 4,500 euros per hectare in France (\$2,367 per acre). These high land prices make it crucial for land to be used efficiently, since it is the scarce factor of production. High land prices also result in high fertilizer use, as seen in Chapter 9. Fertilization rates for many E.U. countries were three to five times higher than in the U.S. in the 1990s but that ratio has fallen in recent years.

The dairy industry in the E.U. is not as productive in the U.S. on a per cow basis. Average milk yields vary from 5,000 to 8,500 kilos per head for E.U. countries, which is 11,000 to 19,000 lbs per cow, while yields in the U.S. are consistently over 20,000 lbs. per cow. This difference in productivity is mostly based on feeding practices: the use of concentrated rations is much more common in the U.S. than in some E.U. countries despite the fact that land is higher priced in Europe.

Land prices in Europe are heavily influenced by urbanization pressures and other non-agricultural uses. The large number of people and the small land mass relative to the US increase the demand for land in all uses. Cash rents for agricultural land are much lower as a percentage of land value than in the U.S. In many areas of the EU, cash rents are only 1-3% of the land's value in some areas, indicating that land owners are obtaining most of their returns on land through capital appreciation. These low cash rents help overcome some of the problems for young people attempting to enter farming, though high land prices make it very difficult to purchase agricultural land.

The EU's Common Agricultural Policy (CAP) is another reason why land prices are high. Agricultural output prices have historically been well above world levels and these high prices are capitalized into land values. The EU has changed its agricultural policies in recent years by lowering intervention prices and instituting cash payments to farmers (whole-farm payments) that don't depend on agricultural production. This has reduced the uplifting effect that agricultural policy has on land values. The CAP has not only kept people on the farms (there were 11.9 million people employed on farms in 2011), it has also allowed smaller-scale farms to stay in business. Rural areas are much more vibrant than in the US because of the large population living on farms. This gives rural Europe and its villages a charm that has been lost in rural America.

Currently cereal producers in the E.U. are guaranteed the intervention price plus they receive a fixed payment attached to their land. Wheat, corn, and barley have identical intervention (or support) prices of 101.31 euros/ton<sup>[32]</sup> (\$132/ton or about \$3.50 per bushel, depending on the grain). In the past producers also received a compensatory payment for their grain production, which would put their prices well above world prices. With intervention prices lower than before and no compensatory payment, E.U. grain prices are much more in line with world prices.

The intervention price for beef and hogs are 2,224 euros per ton (\$101/cwt) and 1,560 euros per ton (\$71/cwt), respectively. The intervention price for beef has fallen greatly over the past ten years while the intervention price for pork has increased. The beef industry in Europe is mostly an offshoot of the dairy industry; so much of the beef is sold as veal calves. The milk price is also very important to the beef industry. Milk prices are not supported through intervention, but butter and milk powder have intervention prices of 2,464 (\$1.45 per lb.) and 1,698 euros per ton (\$1.00 per lb.), respectively. Because the E.U. exports pork, its intervention price must be close to world market levels unless export subsidies are high.

Table 10.6 shows the size structure of farms in the E.U.-27 and six individual countries. This table shows the overall small size of farms in the E.U. and the diversity among countries. Almost 60% of the farms in the E.U. are less than five hectares (12.3 acres), while only 6% of the farms are over 50 hectares (125 acres). The farm size structure in the E.U. has always been much smaller than in the U.S. (where the average farm size is 421 acres), but adding Eastern European countries such as Bulgaria and Romania have made very small farms even more prevalent. Germany and the UK have a higher proportion of large-scale farms than France, but they are still much smaller than typical U.S. farms. The Czech Republic has relatively large farms for Eastern Europe (a legacy from their socialist days), but small farms are quite prevalent in Poland. There will be a future trend towards farm consolidation in Bulgaria, Poland, Romania and other E.U. member countries from the East as economic opportunities increase off-farm. This consolidation needs to happen in order to increase farm income per household.

**Table 10.6 Percentage of Farms in Various Size Categories in the E.U.-27**

	27	France	EU-
	Germany	UK	
Less than 5 hectares	69.2%	26.9%	8.9%
	9.1%		
5-10 hectares	10.9%	9.0%	14.4%
	15.8%		
10-20 hectares	7.5%	9.7%	15.4%
	21.1%		
20-50 hectares	6.4%	17.2%	22.7%
	25.4%		
More than 50 hectares	6.0%	37.2%	38.7%
	28.5%		
	Bulgaria	Czech Rep	
	Poland	Romania	
Less than 5 hectares	91.4%	15.4%	93.1%
	55.2%		
5-10 hectares	2.9%	18.3%	4.7%
	22.2%		
10-20 hectares	1.8%	17.3%	1.1%
	14.5%		
20-50 hectares	1.6%	19.1%	0.5%
	6.3%		
More than 50 hectares	2.3%	29.9%	0.5%
	1.8%		

When farm size is measured on an agricultural sales basis there is more diversity among countries, yet farms are still small in the E.U. Seven out of ten farms in the E.U. have farm income below 25,000 € and only 11% have farm sales above 100,000 € (Table 10.7). Netherlands and Romania provide the sharpest contrast in terms of agricultural sales per farm. There are virtually no farms in Netherlands with less than 25,000 € in farm sales, whereas 98% of the Romanian farms are in this category. Almost three in four Dutch farms have sales greater than 50,000 € but less than 1% of Romanian farms have such sales.

**Table 10.7 Economic Size of Holdings in the E.U.-27, 2010**

	E.U.-27	Netherlands	Romania
Less than 25,000 €	70%	0%	98%
25 to 50,000 €	11%	6%	1%
50 to 100,000 €	9%	19%	0%
100 to 500,000 €	10%	60%	0%
Over 500,000 €	1%	14%	0%

Among the reasons for the small-scale of most farm operations is the legacy of the feudal system in the 8<sup>th</sup> century (Tracy). At that time, most of the land in continental Europe was controlled by hereditary landlords, who allowed peasants to farm the lands. The rural landscape was slowly transformed over time, and the control of land came into the hands of those who worked it. There has never been a push for farmers to accumulate land because they could make a decent living off relatively small plots. Napoleonic law, common in continental Europe, also played a role in keeping farms small because inherited land was normally equally shared among heirs. Over the years, this meant that the average farm size would tend to get smaller as generations passed. Overall, future farm size might increase in the E.U., but this inheritance pattern will tend to keep a bias toward a small-scale farm structure.

High agricultural prices cost European consumers. In 2012, E.U. resident spent anywhere from 9.1% (in the United Kingdom) to 28.6% (in Romania) of their household expenditures on food and non-alcoholic beverages at home (ERS, <http://www.ers.usda.gov/data-products/food-expenditures.aspx#.Ujr8mFNZog8>). More developed E.U. countries (Germany, Netherlands, Sweden, and the United Kingdom), spent between 11 and 13%. The average food expenditures in the U.S. were 6.6%, the lowest in the world. The average Japanese consumer spent 13.8%, while the average Chinese consumer spent 26.9%. Food consumption away from home would account for another 5-6% of expenditures in the E.U.

The E.U. has been a net exporter of agricultural products since 1979, despite these high prices. Table 10.8 shows E.U. exports of agricultural products by subcategory. It is a large net exporter of beverages, such as wine and beer, but it also is a net exporter of meat (particularly pork), cereals, and processed foods. Its main net imports are oilseeds, fruits and vegetables, and fats and oils. In total, the E.U. has a 6.9 billion € (\$9.0 billion) trade surplus, but this surplus is falling over time. To support these exports, however, export subsidies are needed on cereals, pork, and dairy products.

**Table 10.8 Agricultural Trade of the E.U.-27 (excluding Intra-EU) in million euros, 2011.**

	Exports	Imports
Cereals	4,338	5,994
Meat	3,918	7,817
Milk	988	8,488
Fruits and Vegetables	5,881	17,112
Oilseeds	2,231	8,593
Fats and Oils	8,612	3,815
Beverages	<u>21,692</u>	<u>8,591</u>
Total Agriculture	105,247	98,295

## The Common Agricultural Policy, CAP Reform, and GATT

As stated in Chapter 7, the customs union of Europe began in 1957 with a common agricultural policy. It was significant that agriculture was one common policy area in the early EEC. Agriculture helped solidify the idea of a common Europe, and there was great pride among the agricultural industry that it had helped form a united Europe. The industry has used that as a weapon to stall needed reforms in the Common Agricultural Policy and agriculture has been a stumbling block for recent enlargement of the E.U.

The basic objectives of the CAP are to increase agricultural productivity, ensure a fair standard of living for farmers, stabilize agricultural markets, provide certainty of supply, and ensure supplies reach consumers at reasonable prices (Tracy). Because of low agricultural prices throughout the world at times, the CAP has had trouble in ensuring a fair standard of living for its farmers. High agricultural prices have provided enough income for farmers to stay on the land, but their incomes are not comparable to non-farmer incomes. Further farm support comes in the form of direct payments to farmers, rural development payments, and market support.

The CAP has allowed farm numbers to stay high in the E.U. and has preserved a vibrant rural economy throughout. Villages are economically viable units because there are many farmers in rural areas, which is a contrast to rural areas in the U.S. Yet the high prices under the CAP have been capitalized into land prices and made it difficult for new farmers to enter.

Two large agricultural policy concerns came into the forefront during the late 1980s and these concerns have continued since that time. The first concern is about the environment and this coincided with the political popularity of the Green Party throughout the E.U. Worries about nitrates in drinking water, pastures plowed into cropland, lost wildlife habitat, livestock waste disposal, deteriorated soil structures, and lost hedgerows and wetlands made people throughout the E.U. pay attention to agriculture. They questioned the huge incentives for farmers to produce, especially livestock products. The effects of agriculture on greenhouse gas emissions and global warming has added to the anxiety in the last decade.

The second concern was associated with the E.U. budget for agriculture, where expenditures associated with CAP became an issue in the early 1980s. The E.U. wanted to maintain growth in agriculture and agricultural incomes, but this could not be accomplished without exports, which had budget consequences because high internal prices forced the E.U. to institute export subsidies. Agricultural payments (export refunds and price subsidies) were taking over 60% of the E.U.'s budget annually in the late 1980s. Surpluses were mounting and there was no indication that the situation would improve.

The first reforms of the CAP aimed at “rebalancing” production – moving away from products where surpluses were accumulating rapidly. Cereals, beef and butter prices were too high relative to world prices, and reform was needed to reduce output incentives. Policy changes began with milk delivery quotas in 1984, restricting the amount of milk that dairy farmers could sell. In 1988, the E.U. imposes “stabilizers” into the CAP, where maximum guaranteed quantities (MGQs) were established (penalties were imposed if production exceeded the MGQ) and set asides were instituted. The exact policies varied by product, but the idea was to reduce production and therefore reduce CAP budgetary expenditures.

These reforms did little to stem the budgetary pressures on the CAP. Production surpluses continued to mount, and CAP spending skyrocketed. The U.S. was also putting great pressure on the E.U. to change its CAP because the export subsidies and increased production were diminishing U.S. export sales. This time period coincided with the Uruguay Round of the GATT (see Chapter 6) and the Oilseeds Dispute (Explanation Box 10.1), so there was even more call for the E.U. to change its agricultural policies. In June 1991, E.U. Agricultural Commissioner Ray MacSharry developed a comprehensive plan to reform CAP. It called for reductions in price supports for essentially all temperate agricultural products: grains, oilseeds, beef, and dairy.

### *Explanation Box 10.1 US-E.U. Oilseed Dispute*

*One of the bitterest disputes between the E.U. and the U.S. involved oilseeds. Soybeans and by-product feed ingredients have entered the E.U. duty-free since the CAP was formed. This has had a large impact on the typical feed ration in the E.U. for many years[33]. It was natural for the E.U. to attempt to switch production from cereals to oilseeds because of the budgetary problems associated with export refunds paid to dispose of cereal surpluses. The E.U. decided to adopt a high internal rapeseed price (rapeseed is the major oilseed produced in Europe) and provide a crushing subsidy to domestic mills in order to compensate them for the high domestic price.*

*The U.S. registered a complaint with the GATT saying that this subsidy violated the national treatment provisions of GATT, since imported oilseeds were not granted a crushing subsidy. When the GATT ruled the subsidies illegal, the E.U. decided to institute direct payments to producers. However, the U.S. again complained to GATT, and the GATT again ruled in favor of the U.S. in March 1992. When the E.U. did not change its policy, the U.S. announced tariffs on white wine, rapeseed oil, and wheat gluten imports from the E.U. to compensate for lost E.U. markets for oilseeds. An agreement between the U.S. and E.U. was finally reached in November 1992 to limit E.U. production and to institute set asides and other provisions that would control E.U. rapeseed production.*

After one year of intense debate within the E.U., a modified version of the MacSharry Plan was passed in May 1992 and came to be known as CAP reform. This reform called for a 33% reduction in support prices for cereals over three years and a required 15% acreage set aside to qualify for compensatory payments (which were to compensate producers for the lower support prices). Livestock prices were also reduced with the support price for beef, milk, butter, and milk powder falling by 15%, 10%, 5%, and 5%, respectively.

At the same time that the MacSharry Plan was being debated, Arthur Dunkel, the Director-General of the GATT, had drafted a plan to serve as the basis of a Uruguay Round agreement on agriculture. This plan, which was presented in December 1991, was modified by the Blair House Agreement between the U.S. and E.U. (in November 1992), and served as the basis for the final GATT agreement on agriculture outlined in Chapter 6. The fact that CAP Reform and the GATT agreement happened together was no coincidence. The E.U. had to decide how it wanted to reform the CAP before it could be party to any GATT agreement. Once CAP Reform had passed, it was easy to agree to a Uruguay Round package consistent with the reforms.

The E.U. was forced to bind its tariffs (establish a maximum-allowable tariff) due to the Uruguay Round GATT agreement. For grains the tariffs were bound at 155% of the E.U.'s intervention price, but the actual tariff is calculated by subtracting the import price from an internal reference price, a process similar to the previous variable levy system. However, the actual tariff can never exceed the bound rate. Tariffs on all other agricultural imports were fixed at the bound rates (the levy does not vary within the year). Because E.U. compensatory payments were determined as production-neutral and non-trade-distorting for the WTO, the E.U. met the Uruguay Round commitments on internal support, and the E.U.'s tariffication process met the tariff rate reductions required. The E.U. has continued to modify its policies since the Uruguay Round because those two issues, environment and CAP budget, have continued to force reforms. Furthermore, the accession of ten new member countries in 2004 (and further enlargements in 2007 and 2013) dictated major modifications to farm payments.

The E.U.'s Agenda 2000 divided the CAP into two "pillars": production support and rural development. Market support for cereals, milk, beef, and other products were reduced progressively over time to allow E.U. prices to be closer to world prices. Producers were compensated for these lower support prices through direct payments that were initially based on production levels, but later decoupled from current production. The decoupled payments (called the single farm payments) began with the 2003 reform and were based on historical payments from 2000-2002. The decoupled nature of the payments allows E.U. farmers to have more flexibility in their cropping patterns. Farmers receiving single farm payments were forced to "cross-comply" with conditions for food safety, animal welfare, and the environment.

The aim of the second pillar, rural development policy, is to spur economic, social, and environmental development of the countryside. Initially, its budget was 11% of the E.U. budget with three main areas of concern: improving competitiveness, the environment, and the quality of life. Rural development payments through this pillar involved farm modernization, environmental investments, diversification, establishment of producer groups, and support for young farmers. Poland was the country with the most funds going for rural development in 2011 (1.8 billion euros), followed by Italy (1.4 billion euros), Romania (1.4 billion euros), Germany (1.3 billion euros), and Spain (1.2 billion euros). Notice that these funds are not only for the poorest countries, but they flow to rural areas through the E.U. to improve rural life.

The E.U. budget continues to be dominated by CAP payments, but it is much less than in earlier decades. Table 10.9 overviews the E.U. budget by major categories within agriculture compared to the total E.U. budget. In that year, 40.5 billion euros were spent on direct aid to farmers, 3.2 billion was spent on intervention in agricultural markets, and another 14.6 billion euros were spent on rural development. In total, agriculture was 41% of the E.U. budget for CAP, but only 30% was direct aid to farmers and market support, while 10% was rural development. The CAP accounted for 71% of E.U. expenditures in the early 1980s, so the E.U. budget has expanded in other areas. The E.U. budget for regional support has taken up a larger percentage of expenditures over time.

**Table 10.9 E.U. Budget Expenditures for 2012, million euros**

Intervention in agricultural markets	2,812
Direct Aid	41,027
Rural Development	14,804
Total Agriculture	59,024
Total Budget	147,353



## Other Issues with Respect to E.U. Agriculture

It is well known that Europeans are highly sensitive to the way that their food is produced (and prepared). Many European consumers want to know more about the production process behind the food they eat and they are willing to pay a higher price if they understand the process. Protected designations of origin (PDO) and protected geographical indications (PGI) allow E.U. producers to certify their production process and the region of Europe where they are produced. Some very familiar products are traditional products that were developed in very specific regions of Europe, and PDOs and PGIs allow those regions to develop trademarks that identify those products. Products that are PDO are fully produced and processed through a traditional manner in the region, while PGI products must be fully produced through a traditional manner in the region, but some processing can take place outside the region.

A familiar example is champagne, which now can only be produced in the Champagne region of France. Sparkling wine might be produced with the same process as champagne and one might not be able to distinguish a difference between sparkling wine from Spain and champagne from France, but only the French product can be labeled as champagne. Producers of PDO and PGI products argue that the unique climate, soils, and production practices of their region make these products unique. They can only be produced in those areas under traditional methods. Furthermore, it was the producers in their region that developed the trademark and it is not fair for other producers to gain from the reputation built by the European region. Other familiar examples are camembert cheese (France), Parma ham (Italy), and feta cheese (Greece)[\[34\]](#).

At the end of 2011 there were a total of 979 PDOs/PGIs within the E.U. Italy had the most distinctions (246); other leading countries for distinctions were France (192), Spain (158), Portugal (118), Greece (97), and Germany (89). There are more of these distinctions for fruits, vegetables, and cereals (300) than for any other food category. There are also many geographic distinctions for meats (259), cheeses (204), and even fats and oils (117). This shows the interest that European consumers have for these specialized products.

Historically, these designations have been disputed by countries outside the E.U. For many years California producers of sparkling wine would label their product as “champagne” and various cheese producers throughout the world would label their product as “camembert,” but now these geographic distinctions are recognized by almost all countries and the labeling for non-PDO/PGI countries has changed to reflect the generic production process rather than the geographic region of the product’s origin. Furthermore, non-E.U. countries have their own products with geographic and process indications, such as bourbon whiskey, Columbian coffee, and Vidalia onions. All of these products cater to specific consumers who value the characteristics of these products and are willing to pay more for them.

A second important issue with respect to E.U. agriculture is the use of genetically-modified organisms (GMOs). The E.U. does allow some GMOs to be produced in their countries, but their regulatory approval process is much more stringent and time-consuming than in the U.S. and many other countries. Spain is the country that accounts for most of the E.U.’s area sown to GMO crops. They had 97 thousand hectares of GMO crops in 2011 (out of the 115 thousand hectares in total within the E.U.). Romania is second at 7.7 thousand hectares. Romania was much more active in GMO crop research and commercialization until it joined the E.U. in 2007. That accession forced Romania to cut back on GMO production and research markedly.

## Summary

1. Agriculture is less important in the E.U. than in the U.S., however, there are places in the E.U. where agriculture is very important. Yet the higher-income countries of the EU, France, Germany, and Netherlands, dominate the agricultural and agribusiness sector.
2. Agriculture in the E.U. is quite diverse. France is a major agricultural producer and the Netherlands has a highly intense, technical agricultural sector. Italy and Spain have the least developed agricultural sector among the large countries and their agriculture is more Mediterranean in style.
3. The Northern E.U. countries produce large quantities of wheat, barley, milk and hogs, whereas the Southern E.U. countries produce large quantities of wine, olive oil, and fruits and vegetables.
4. Crop yields in the E.U. are much higher than in the U.S. for most products. Land is scarcer and land prices are higher; and fertilization rates are much higher.
5. Agricultural production in the E.U. occurs on a much smaller scale than in the U.S. Most of the farms are smaller than 50 hectares.
6. The E.U. has had to change its CAP often because of budgetary expenditures and commodity surpluses. Milk quotas began in the late 1980s and there were efforts to rebalance crop production in the early 1990s. The CAP reforms in recent years have moved toward lower commodity prices that are compensated by single farm payments.
7. European producers have led the way in establishing PDOs and PGIs that provide unique characteristics to their food products (and therefore command higher prices).

## Questions

1. How would U.S. farmers change their cropping patterns if land cost \$10,000 to \$20,000 per acre? Would farmers still have income and cash-flow problems?
2. How has CAP reform impacted rural areas in the E.U.? How have their policies prevented their villages from becoming ghost towns, as has happened in many parts of the U.S.?
3. Agricultural disputes between the U.S. and E.U. have been frequent over the years. How have these conflicts affected the overall economic relationship between the U.S. and E.U.?
4. Do you feel that PGIs and PDOs are justified? Should U.S. producers work harder to have their own geographic distinctions on products?



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## Chapter 11. China

No country in the world has transformed itself so dramatically on a large-scale basis as China since 1975. The country has made enormous strides to become an economic and industrial powerhouse. It has had to overcome problems with a socialistic past, undernourished population, poorly educated workforce, and overcrowded cities during this transition and some of those problems (and others) still remain. Many of these reforms have been gradual and incremental, under the steady eye of the Communist Party. Yet the progress has been tremendous and has helped economic conditions in China. These changes have also had enormous effects on world agriculture too.

Agricultural policies were at the forefront of the Chinese economic reforms because so much of the population lived in rural areas on farms in the 1970s (70% of the people were employed in agriculture during that time). Everyone was poor and eked out a meager living on a small plot of land that was allocated to them by local officials. Before the reforms all production decisions were made by local leaders based on the central plan developed by the government. Individual farmers only had small plots where they could produce for their own use (they were not allowed to sell such produce to others). All produce was delivered to the State. Agricultural prices received by delivering the quota were low so that money was extracted from rural residents to fund industrial projects in mostly state-owned enterprises (SOEs). All land was collectively owned (and it still is)[\[35\]](#)

## The Economic Reforms

The major reforms began in 1978 and focused on agriculture because it was so important to the economy. The Household Responsibility System (HRS) was introduced and this policy allowed the collective land to be leased to individuals on a long-term basis. Farms paid their “rent” by delivering a fixed quota to the State. The prices received by farmers from the quota were not high, but farmers were allowed to keep the surplus and sell the output on free markets. The State had focused its efforts on promoting grain production to make sure there was food for the poor, but farmers took advantage of this increased flexibility in planting to shift from grains to cash crops and livestock. All agricultural production went up because there were financial incentives for productivity improvements and farmers responded with more output. Yet it was production of cash crops and livestock products that increased the most.

Industrial reforms began in the 1980s and the dominance of the SOEs was addressed. Those enterprises employed most of the people in the urban areas, accounted for most of the bank loans, and produced most of the country’s output. These SOEs were restructured to make them more efficient and smaller enterprises were encouraged; private enterprises were even allowed. Because most of the people lived in the rural areas and agricultural productivity was low, the government decided to allow labor mobility from the rural areas to the city to soak up this excess labor in the rural areas.<sup>[36]</sup> This gave businesses in the urban areas access to very cheap (though not very skilled) labor. Rural residents were willing to go to the cities because wages were much higher than what they earned on their small farms.

The Township and Village Enterprises (TVEs) also began around this time. TVEs allowed workers to stay in smaller cities and still work in productive, manufacturing industries. This got people off the farm (and allowed them to increase wage earnings) yet kept them from migrating to the large cities which suffered (and still suffer) from congestion, overcrowding, and lack of public services. The release of labor from agriculture allowed industry to grow and agricultural labor productivity to increase because each farmer had more land to work. It was a win-win situation for the rural and urban areas as long as urban crowding could be held in check.

The free markets for agricultural goods allowed prices that were different than the administered prices received from the State through the quota system. At times there were constraints on prices (particularly staples such as rice and pork), but markets were increasingly liberalized over time. Interregional trade among provinces was allowed which diminished price and commodity supply differences over space. The government also lowered tariffs on many agricultural goods in the 1990s and they did away with the monopoly status of the State-owned agricultural trading companies. All of these factors helped make agricultural production and consumption more efficient, allowing improved welfare for the Chinese people.

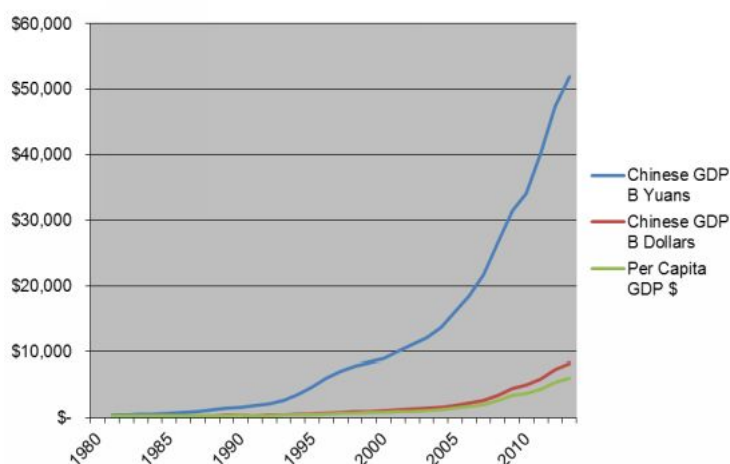
An important milestone in the liberalization process was the entry of China into the WTO in December 2001. Before WTO accession, tariffs were quite high in China (overall tariffs were around 40% in the early 1990s), but the government pledged to reduce them to less than 7% during a short transition period. The accession negotiations for agriculture were relatively easy because of China’s low agricultural subsidies at that time. In fact, China was given subsidy ceilings that were much higher than their levels in the 1990s. However, agricultural tariffs were 40-60% for most items and those tariffs immediately fell to less than 17% by accession. They have diminished since that time too.

## **China Today**

The economic growth rate in China was often over 10% per year during the 1990s and 2000s. Figure 11.1 shows Chinese GDP from 1970 to the present. Its GDP was \$9.33 trillion in 2013, far above its \$161 billion in 1975; and if GDP is adjusted for purchasing power it is \$13.39 billion (ranking second behind the U.S. or ranking third if the E.U. is considered as a country). If one considers its population, though, China's per capita GDP is \$9,800 (about the same as Dominican Republic and Thailand). Nonetheless, these economic statistics have climbed steeply since economic reforms were instituted in the 1970s and China has been transformed. There is a middle class that has money in China and poverty has diminished tremendously.



**Figure 11.1 Chinese GDP in Yuans, US Dollars and Per Capita US Dollars**



China is the most populous country in the world with 1.37 billion people in an area slightly smaller than the U.S. Yet much of the country has a harsh climate or difficult terrain. There are deserts in the west and mountains in the southeast; cold winters in the north and a tropical climate in the south. Most people live in the eastern sections of the country close to the ocean. China has three of the top twenty largest cities in the world (based on the metropolitan area), Shanghai (21.8 million), Beijing (18.2 million), and Guangzhou (17.7 million). There are 50 cities of over one million people in the country (many you have likely never heard about). China still has a large rural population, though, with only 53.7% of the people living in urban areas compared to 82.4% in the U.S. There are still pressures for migration from rural areas to the cities.

The one-family, one-child policy has stemmed the birthrate in China so that its population growth rate is rather low (0.46%). China's population has still grown quite a lot since the policy was instituted in 1979, but the growth has been much lower than without the regulations. Now there is a problem with a rapidly aging population relative to people in the prime working ages, so there is pressure to relax the policy. Currently there are many circumstances where families are allowed to have a second child and it is expected that more circumstances will be added as time progresses until the policy is eliminated.

The median age in China is 35.2, a little lower than in the U.S. The life expectancy in China is 74.2 years (versus 79.8 years in the U.S.) and their human development index (which combines life expectancy, education, and income measures) is 0.67 (versus 0.94 for the U.S.). Chinese incomes have grown rapidly but they still have a long way to go. Their educational system and environmental regulations will likely improve in the coming decades in order to improve their population's well-being. Air and water pollution are huge problems for the Chinese government. The air quality in major cities (Beijing, Shanghai) is often very, very poor during many times of the year and it is suggested that many people suffer lower life expectancies because of air pollution. It is expected that Chinese authorities will place more future emphasis on improving the environment than on increasing household money incomes.

China has made great progress in reducing poverty since the reforms began. The World Bank still estimates that 27.2% of the population lives on less than \$2 per day (the unofficial international poverty line) and 11.8% live on less than \$1.25 per day. These are similar to Guatemala and Honduras. However, the International Food Policy Research Institute estimates that the percentage of Chinese undernourished fell from 22.9% in 1990-92 to 11.4% in 2011-13, which is a big accomplishment. The differences in urban and rural incomes, though, are still a problem that will be discussed later.

## Chinese Agriculture

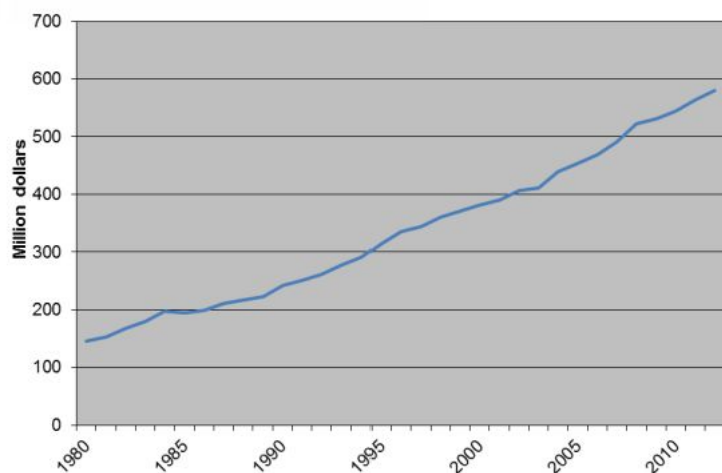
Chinese agriculture operates under some severe limitations, particularly land and water constraints. As stated earlier, China's population is about four times the U.S., but it has only about 75% as much arable land as the U.S. Nonetheless, China's agricultural output is often three times what is produced in the U.S. Farmers work hard in China and are very productive given their resource constraints. Changes in agricultural policy have promoted agricultural development. In the years after the revolution prices received by farmers for quota deliveries were quite low but in the late 1990s the government paid above market prices. Finally the quotas were eliminated in the early 2000s and farmers were free to plant whatever they desired.

Agricultural taxes also extracted money from farmers in the early years of the transition. National, provincial, and local taxes were approximately 8-10% of cash costs for grains during the late 1990s and early 2000s. All of these taxes were eliminated by 2006 to lessen the burden on agriculture (increasing incomes in rural areas by 41 to 58 billion yuan); instead subsidies have played a more pronounced role. These agricultural subsidies began in 2004, when they totaled 14.5 billion yuan (almost all for grain subsidies at that point), for grain, seed, and machinery. The government has two objectives from these subsidies: increase grain output and increase farm income (to help close the rural-urban income gap).

Grain subsidies came through various policies (including price supports or protection prices for rice and wheat). Agricultural subsidies increased rapidly, going to 51.4 billion yuan in 2007 and 95 billion in in 2008 (\$17.5 billion in agricultural subsidies in 2009); and they have continued upward since. Now agricultural subsidies amount to 200 billion yuan (for 2013) and come in the form of grain subsidies, seed subsidies, machinery subsidies, and other input subsidies. Input subsidies are much more important now; and spending on rural infrastructure (roads, irrigation, and electricity supply) is also very large. The change from taxing agriculture to subsidizing it has increased net farm income and made it a little more lucrative to stay on the farm. The subsidies are large on a per hectare basis, but quite low on a per farm basis. So people continue to leave the rural areas because urban incomes are approximately three times rural incomes.

Rural agricultural employment peaked in 1990 at 391 million, but 36.7% of the people are still employed in agriculture (down from 50% as recently as 2002). Chinese agricultural production continues to increase for almost every agricultural commodity while rural areas continue to supply laborers to the cities for industrial development. Figure 11.2 shows Chinese agricultural production since 1980 adjusted for commodity price inflation. The increase has been steep despite lots of farmland being developed into factories and other industrial and urban uses. Farmers use chemicals heavily on their land to improve yields and compensate for their small scale. Fertilizer consumption in China has grown from 5.4 million tons in 1975 to 55.6 million tons in 2010; that is 548 kg per hectare versus 120 kg per hectare in the US. Nitrogen and other fertilizer use has increased markedly during the last thirty years, though there was a large drop-off in 2009 (Figure 11.3).

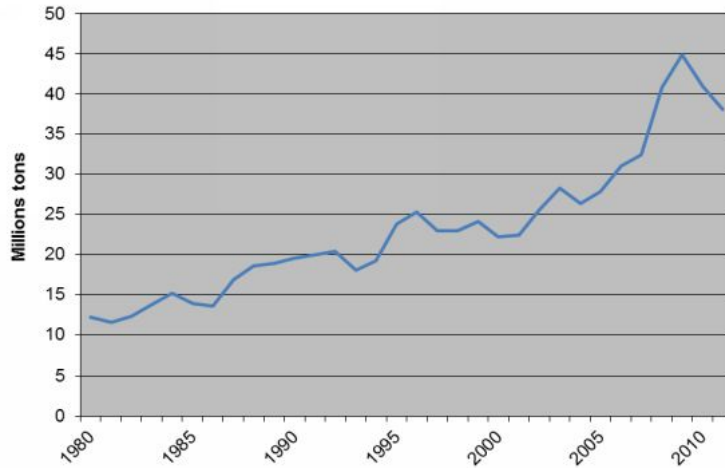
**Figure 11.2 Gross Value of Production in Constant Dollars**



Cultivated area peaked for China in 1996 at 130 million hectares. The 2007 Census of Agriculture for China found that there were 200 million farm households and 122 million hectares of cultivated land. The U.S. has 0.51 hectares (or 1.26 acres) of arable land per capita, whereas China has only 0.08. Plus there are a lot more Chinese farmers than American farmers so their average farm size is only 1.5 acres; miniscule by

U.S. standards. Four out of every five farmers have off-farm income to supplement their earnings. Nonetheless, grain production increased from 247 million metric tons in 1978 to 407 million metric tons in 2008 (Figure 11.4). The country continues to produce more each year with less land and fewer workers.

**Figure 11.3 Nitrogen Consumption**



Chinese agriculture faces other constraints too, including land and water management; modern food marketing chains; food safety; and low rural incomes. As stated earlier, all land is still collectively owned, but long-term leases are available for farmers. Still, tenure rights are not secure so that some farm investments that could improve productivity are not made and very few farmers (around 9%) have a loan for their operation because they have no collateral. The situation has improved in rural areas because all agricultural prices are market determined and farmers no longer have quotas to deliver to the government for their land leases. Yet farmers suffer with insecure water rights and a weak legal system that increases their production risks; these are more reasons for reduced investments in agriculture and food production.

**Figure 11.4 Grain Production**



Water is probably the biggest issue in Chinese agriculture now. China's per capita water availability is only 30% of the world's average and in the North it is less than 10% of the world's average. Some of the largest agricultural provinces in China, Henan and Shandong, are within the area of low rainfall. Water is owned by the state and its price is very low so it is not used very efficiently; yet it has a very high value in rural and urban uses. The government has had many large-scale projects to bring water from the South (which is tropical) to the North, such as the Grand Canal (which is over 1,100 miles long) that dates back to the 5th century B.C. The current one under development is the South-North Water Transfer Project aimed at bringing up to 45 billion cubic meters of water from the Yangtze River to the North, but it is not completed and progress has been delayed. China nonetheless is increasing its area under irrigation to provide water for crops

and livestock. Irrigated land area has increased from 43.3 million hectares in 1975 to 63.0 million hectares in 2013; most of that increase has come since 1996.

Some important institutions that could support agricultural development do not exist in China. The scale of agriculture is impeded because farmers cannot purchase and own land. They cannot receive a loan based on collateral from land ownership either. Even the expected profitability from their lease is difficult to incorporate into the financial sector because village leaders can take the land away without cause. There are many stories about leaders selling land for development, pocketing some of the money, and leaving farmers with nowhere to till. Thus rural China is undercapitalized and technology is low in most areas. This is another reason that chemical input use is so high because farmers can fund their use out of cash flow.

Food safety is also an important issue for Chinese food manufacturers. The marketing system in China is not conducive to preserving product quality. The regulatory system is weak, there are many counterfeit products, and traceability is difficult; so safety scares and outbreaks are common. The 2008 incident where melamine was found in infant formula is one of the most noteworthy – six infants died and tens of thousands were hospitalized. Yet this is only one of many safety incidents that have shown the problems within the food industry of China. The food processing system needs to improve its uniformity, traceability, and food safety assurance in order to regain the confidence of Chinese consumers. Now most domestic and international consumers are reluctant to purchase some Chinese processed food products.

## Agricultural Production

Chinese are known for growing rice, but in 2012 they planted more corn than any other crop (35.0 million hectares (MH) in 2012). There are large areas for rice (30.3 MH), wheat (24.1 MH), vegetables (24.6 MH), and oilseeds (13.9 hectares) too. The northeast regions are known for corn and soybean production; the central areas are known for wheat production; and the south is known for rice production. Vegetables are grown throughout the country (often in greenhouses made with simple plastic sheets). Permanent orchards account for another 12.1 MH. The Chinese have little land per person but they use every little bit that they can.

China produced more corn than rice (208 million metric tons (MMTs) of corn versus 204 MMTs of rice), despite growing two crops of rice per year in most locations and three crops per year in some. They also produce a great deal of wheat (121 MMTs) and it is vast wheat fields that you will see as you arrive at Beijing's international airport (rice is grown in the south). The Chinese produce a huge amount of fruits and vegetables – both are a very important part of their diet. There was 577 million metric tons (MMTs) of vegetables produced in China during 2012. The Chinese eat an extraordinary quantity of vegetables in their diet and they produce most of them (and even export some). They also produce large amounts of fruit (137.1 MMTs in 2012).

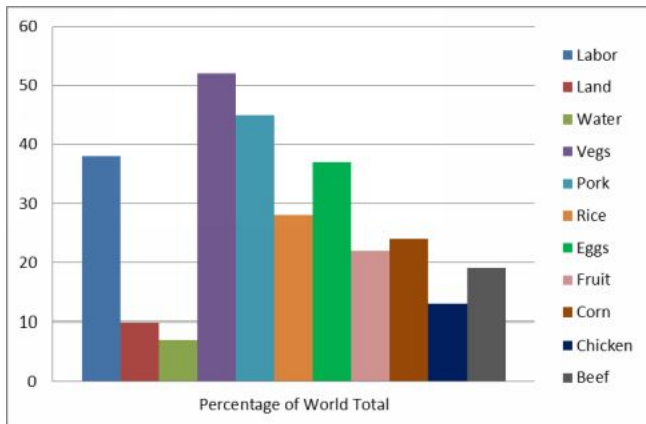
Grain yields in China hover around 5-7 MTs per hectare (5.9 MT/H for corn; 6.7 MT/H for rice; and 5.0 MT/H for wheat). These yields are lower than in the U.S. for corn (7.7 MT/H) and rice (8.3 MT/H), but higher than U.S. wheat yields (3.1 MT/H because it is grown in areas with less precipitation). However, Chinese yields are much higher than in many developing countries. India's yields for corn, rice, and wheat were 2.5, 3.6, and 3.2 MT/H, respectively in 2012; so China's yields were double India's corn yields and rice yields were 80% higher). China even had higher yields than Thailand for corn and rice (4.5 MT/H and 3.0 MT/H), which is a major exporter of both grains. These relatively high yields are indicative of land's scarcity and high value – farmers want to get as much output from their small plots as possible.

Chinese farmers get much higher returns from vegetables than other crops, but vegetables take much more water to produce. The Economic Research Service estimated net cash returns per acre for various crops produced in China for 2006. These figures may be out of date, but the relative ranking of crops has likely not changed markedly. Vegetable returns varied from \$3,800 to \$12,500 per acre (which is quite high); fruit returns were \$1,800 to \$2,400 per acres (also high). Peanuts, tobacco, sugar, and cotton had returns from \$500 to \$800 per acre. Land intensive grain crops had returns of less than \$500 per acre, so farmers often only grow grain for family needs and as a safety net. They prefer to grow non-grain crops to generate cash income if there is water and labor available.

Livestock production in China is dominated by pork production (50.0 MMTs were produced in 2012). Traditionally peasant farmers would feed household scraps and other low-quality feeds to one or two hogs so that they could slaughter an animal ever year or two. This was all the meat that a typical household would consume. There were also some chickens in the backyard, but dairy animals were not common. Now dairy production is more common because it is a relatively inexpensive form of protein. Milk production was 37.8 MMTs in 2012; egg production is also important with production of 24.8 MMTs, though chicken production is relatively small at 13.2 MMTs. Some of the pork, chicken, and dairy are produced through modern integrated systems (which use concentrated feeds in a confinement operation), but much of it remains small-scale, backyard production. Beef and mutton production were 6.3 and 4.0 MMTs, respectively.

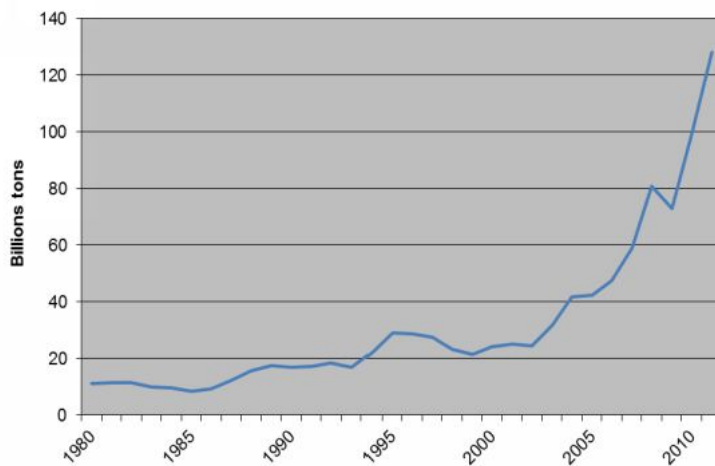
Figure 11.5 compares China's share of world production for various important agricultural commodities relative to its share of world agricultural inputs. It only has 38% of the world's agricultural labor, 10% of the world's agricultural land, and 7% of the world's water (according to the Economic Research Service), yet in 2012 it produced 52% of the world's vegetables; 45% of the world's pork; 28% of its rice; 37% of its eggs; and 22% of its fruit. It has smaller shares of world output for corn (24%), wheat (18%), chicken (13%) oilseeds (11%), and beef (10%). Its large rural population makes it suited toward labor-intensive crops such as fruits and vegetables.

**Figure 11.5 China's Share of Agricultural Resources and Outputs**

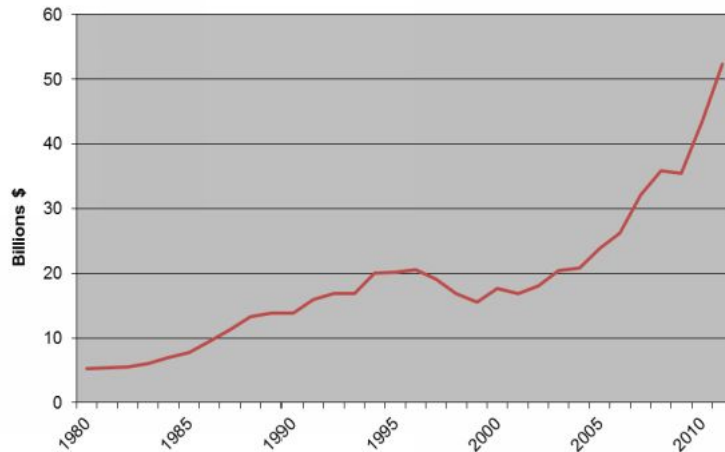


Historically, the Chinese agricultural economy has been surprisingly closed to international trade. They consumed what foods they produced and imported little. Their increase in agricultural imports has been astounding since 2006, when imports were less than \$50B (Figure 11.6). Agricultural imports increased by almost \$30B (or 30%) alone from 2010 to 2011. In 2011, their imports reached \$95.1 billion, making them the second leading agricultural importing country (behind the U.S. and slightly ahead of Germany). Much of this increase is likely due to income increases in China, yet continued trade reforms and other liberalizations have made it easier to import food items into the country. The country's largest agricultural import items are soybeans (\$29.7B), cotton (\$9.5 B), rubber (\$8.6B), and palm oil (\$6.6B). The soybeans are used for food (tofu) and meal/oil, while the cotton and rubber are used for manufacturing into final products. Many observers have always thought that China would be a major agricultural importer, but their agricultural exports have been surprising. They reached \$42.3 billion in 2011 and they reflect the comparative advantage that China has in producing some labor intensive crops (particularly fruits and vegetables) relative to their neighbors (Japan and Korea). The growth in agricultural exports has also been impressive (though less than imports) with exports doubling between 2006 and 2011 (Figure 11.7). China's largest exports are fruits and vegetables, totaling \$18.9B in 2011.

**Figure 11.6 Chinese Agricultural Imports**



**Figure 11.7 Chinese Agricultural Exports**



This opening of more trade (and higher household incomes) has allowed the Chinese diet to change. Consumption of livestock products is increasing while consumption of some grains is decreasing. Yet these trends differ by region and socio-economic status. The rural/urban divide is particularly important because consumption patterns differ greatly between rural and urban residents. First, urban residents have a much higher disposable income so they have more money to spend. The average urban resident had income of 19,109 yuans in 2010 and spent 13,472 on living expenses (4,805 of this was food). This contrasts with rural resident incomes of only 5,919 per person in 2010 and 3,859 in living expenses (1,313 was food). Rural residents produce much of their own food, so their expenditures do not reflect their consumption perfectly. Urban dwellers spend 36% of their income on food while rural residents spend 22% of their income on food.

The China State Statistical Bureau estimates in 2010 that rural residents consumed 181 kgs of cereals per year (mostly rice and wheat), whereas urban residents consumed only 82 kgs. of cereals. Per capita cereal consumption has fallen rapidly in rural areas but has increased in urban areas. Per capita vegetable consumption was similar between urban and rural residents (116 kgs for urban versus 93 for rural), but meat consumption was much higher for urban residents. Pork, milk, poultry, egg, beef/mutton, and milk consumption in urban areas was 20.7, 18.1, 10.2, 10.0, and 3.8, respectively, versus 14.4, 3.6, 4.2, 5.1, and 1.4. Increased Chinese urbanization will continue to lead to more food consumption and likely increased imports.

## **Agricultural Research**

The Chinese government has been very active in promoting agricultural research. China has approximately 43,000 full-time equivalent public agricultural researchers (more than any other country) and it spends more on public sector agricultural research than any other country. Its public sector research and development expenditures doubled in real terms between 2001 and 2008 (reaching 14 billion yuans). Most of the research is performed in government research agencies (84%), as opposed to university research (16%). Public sector agricultural research is decentralized too with the provinces and even prefectures accounting for a lot of the expenditures. The private sector is increasing its research expenditures rapidly, accounting for 16% of agricultural research in 2008. When measured relative to agricultural output, though, China's research spending is only about 50% of most developed countries (like the U.S.).

China has traditionally been very supportive of GMO research and approvals. In 2008 the State Council approved \$3.5 billion in funding for research on new biotech varieties between 2009 and 2020. Currently, China is the 6th largest producer of GMO plants and they account for four million hectares of production. There are labeling requirements for some products that are directly consumed by consumers (such as soybean oil). Yet there is beginning to be more consumer reactions towards GMOs that has led the government to slow their development and approvals. Some of this slowdown is likely due to the recent food safety incidents in China and the concomitant distrust of the food system. A recent study (Xiang et al.) has found that GMO disapproval ratings among internet users have increased in each of the last four years.



## Summary

1. The Chinese agricultural economy has undergone a tremendous transformation in the last thirty years, moving from a very poor, socialistic, and unproductive situation for farmers to a more modern system that is exporting fruits and vegetables to many parts of the world.
2. Rural and urban incomes have increased rapidly since 1990 and China has become an economic powerhouse.
3. Millions of Chinese workers have transferred from farming to the manufacturing sector during this transition, but the farm scale in China is still very small.
4. The country also suffers from water and environmental problems that influence agricultural production. Yet Chinese farmers make the most of the land they have by using relatively large amounts of input and generating relatively high yields.
5. The years ahead will likely bring many more changes to Chinese agriculture. The country will continue to be a major focus for agribusinesses throughout the world.

## Questions

1. Will China continue to be a large agricultural exporter by 2050? Explain.
2. How can China solve its water problems in the North and West? Are there policies that could be enacted to improve the situation?
3. The poverty rate in China has diminished greatly over the last twenty years. How did that happen and how can China diminish its poverty rate in the future?
4. How will China's food consumption pattern change in the future? What other countries might you investigate to get an idea of its consumption path as incomes increase?

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## Chapter 12. Foreign Direct Investment and Processed Food Trade

Exporting is only one of several ways that a company can reach international markets. The most common way is through foreign direct investment (FDI). A firm is understood to have foreign direct investment when it has an ownership interest of at least 10% in a foreign operation. A firm with an ownership presence in more than one country is a multinational enterprise (MNE), and the companies that the MNE owns outside its home country are *affiliates* (foreign subsidiaries) of the MNE. The firm in the home country is called the *parent*, and the affiliates are located in host countries.

The value of FDI between countries has grown faster than trade for the last three decades. In 1985 FDI flows were \$60 billion compared with \$1,311 billion in 2012 (OECD) – multiplying by over 20 times in less than 30 years! It is estimated that the stock of FDI reached \$22.8 trillion in 2012, more than merchandise trade for that year, which totaled \$18.9 trillion (WTO). These FDI flows come from equity investments through acquisitions or greenfield (new) investments, reinvested earnings from affiliates, and borrowing between parents (the home office) and affiliates. These investments bring not only financial resources but also new technology, managerial and organizational innovations, marketing skills and resources, and other intangible assets. Over time, host countries have been increasingly interested in spillover benefits brought by MNEs that help modernize their industries.

This chapter covers foreign direct investment and the actions of MNEs, including the reasons they invest abroad. Costs and benefits to the home and host countries are also outlined briefly. Finally, the extent of FDI in the food processing, wholesaling, retailing, and food service industries is covered. This important chapter provides the background to understand the increasing globalization of world food industries.

## Foreign Direct Investment Concepts

The MNEs are not only important investors internationally, but trade among parents and affiliates account for approximately 33% of international trade and MNE exports to non-affiliated firms account for another 33% of world trade. These shipments among MNE parents and affiliates are classified as intrafirm because there is no “arms-length” sale between units of the MNE. The prices charged among units (parent and affiliates) of the same MNE are *transfer prices*, and it is alleged that MNEs often hide profits by using transfer prices that are not reflective of market values. This would allow the MNE to have high profits in low-tax countries and low profits in high-tax countries.

The growth in FDI has been important despite obvious risks and hassles with respect to operating facilities in foreign countries. Exporting is certainly a lower risk strategy for reaching a market because the loss associated with exporting is capped by the value of a shipment. MNEs can lose huge investments if their foreign facilities are nationalized by governments or destroyed through violence or upheaval. It seems logical that a company would find it easier to produce a product in its home country and export it, rather than set up production facilities in foreign lands with different cultures, legal systems, business practices, and the like. Nonetheless, FDI has been and continues to be a very important commercial activity.

Dunning defined three advantages for a firm to invest in foreign production facilities (i.e., to become an MNE): ownership, location, and internalization (OLI). This paradigm is often labeled as the OLI theory of FDI. There have been refinements to this theory since Dunning, but most of the work has been to refine ideas associated with the OLI framework, or to integrate the theory of MNEs more fully into the theory of the firm (Ethier, Rugman, Helpman).

## **Locational Advantages**

The location aspects of the framework are easiest to see because they relate to the same factors that cause countries to trade goods. In this sense, FDI (which is a way of trading financial and technological inputs) can be viewed as a substitute for trade in goods. Differences in factor costs and endowments – such as lower wage costs, cheaper input prices, higher skilled workers, and other input advantages -- are a major reason for a firm to locate an affiliate in a foreign land.

Import barriers can establish a large difference between the landed price for a good (before going through customs) and the internal price of the good. In this case, a company must pay a tariff, obtain a quota, or meet other terms of the trade barrier before the good can enter the potential market. If, instead, the company located a plant in the host country, the affiliate's output would not be subject to the import barrier (the affiliate enjoys "national treatment" in the host country). This is an incentive to locate the plant in another country. Transportation costs also establish a wedge between the price of the product in the exporting country and the importing country, again giving advantages for the firm to locate production in the importing country.

Higher potential growth rates and larger market sizes in host countries are other reasons why a firm might choose to locate a plant in a foreign country. Yet these and other locational advantages alone can be only one part of an FDI theory, because these same locational advantages could be exploited by a domestic firm. A domestic firm could capture the above advantages when they established a plant too. Why is the plant established by an MNE, which will have natural disadvantages relative to a domestic firm? The other two parts of the OLI framework provide more insights into why an MNE will invest in the host country.

## Ownership Advantages

Even if locational differences exist such that certain countries have an advantage over others, this does not explain why a foreign company would find it profitable to invest in the host country. That firm must have some advantages over domestic firms; otherwise domestic firms would exploit the same locational advantages more profitably (since domestic firms would be more comfortable with the business environment, etc.).

Most MNEs are known for having many advantages over the typical domestic firm in the host country. MNEs often bring huge financial resources, technology, patents and other trademarks (brands), and management, marketing and organizational skills that are not available in the host country. The access to new production and information technology, monopolistic power (through patents and trademarks), and marketing skills make the typical MNE a very powerful competitor for domestic firms. Therefore, the MNE can use its ownership advantages to overcome some advantages of domestic firms.

The affiliate of an MNE is also a member of a vast production and marketing network with an organizational structure that reduces costs and enhances the flow of goods among countries. The affiliate can have access to cheaper inputs from the parent or other affiliates, more knowledge of international markets, and much enhanced administrative experience in an increasingly global market. MNEs are often viewed as more flexible because their management is accustomed to working in many different countries. This makes them more likely to change strategies among countries to allow improved operations.

Dunning claims that MNEs tend to be successful in primary goods that require large investments (such as mining), technologically advanced manufacturing (such as automobiles and some electronics), skill or information-intensive industries (such as grain trading), industries where spatial integration is important (such as hotels and airlines), and industries characterized by high trade barriers or transportation costs (such as automobiles). He argues that it is especially important for the MNE to capture advantages that cannot be patented -- financial systems, organizational skills, marketing expertise, industrial relations philosophy -- because patents expire and can be undermined by product innovations. These non-patented advantages are more difficult to develop, but they are also more difficult to lose over time.[\[37\]](#)

Horst claims that the food industry is not a high technology industry, but FDI in the food industry is still very large and important (as will be discussed). He thinks that U.S. firms choose to invest overseas because they see the U.S. trends being mimicked by international markets. American firms can take advantage of well-established U.S. trends toward supermarkets, advertising, and product differentiation that are taking hold throughout the rest of the world. Their supply chains are very developed and can deliver quality products through enhanced logistics. Further, American food companies have been diversifying into new products for many years (away from products with slow sales growth) and FDI is a natural part of that diversification process. U.S. food firms are integrating (through FDI) into faster-growing markets that are interested in new products. U.S. food MNEs can perform this efficiently through expanding their distribution and marketing networks because their returns are already large in the U.S.

## Internalization

Even though MNEs may have specific advantages that other firms do not, this does not guarantee that direct investment is the most profitable approach for the MNE. There are other arrangements that can be devised where the parent company would receive a return on those advantages without being directly involved in investment in the host country. If the arrangements allowed an adequate return on those advantages and saved the MNE from operating in a foreign environment, it seems logical that the parent company would choose to sell its advantages to a local firm in the host country. Such arrangements could involve licensing, consulting contracts, or other standard agreements.

Despite mechanisms that would allow the parent company to receive royalty payments or other income from its partner in the host country, the parent company usually exploits its advantages internally by investing in the host country -- thus becoming an MNE. It is important, though, to recognize that the company must receive more profit in internalizing the advantage if it becomes an MNE, otherwise the firm would lose by FDI.

To clarify the point, suppose a company owned a patent on the formulation for a soft drink in the U.S. and the company wanted to exploit its formulation all over the world. The company could produce the product in the U.S. and ship it all over the world. However, transportation costs for beverages are quite high relative to value, and it would be much easier for processing facilities in foreign countries to make the product. The company could compete more effectively with locally produced beverages if these cost advantages of locating in other countries were exploited.

The company could build production facilities throughout the world using the special formulation (and hopefully obtaining patent protection in each market where the beverage is produced). Yet it seems much easier for the company to negotiate a licensing agreement with a domestic company in each of the host countries so that a royalty payment is made to the U.S. company for the right to produce the beverage in the host country. If the negotiation process is perfectly competitive, the U.S. company will receive a fair return for use of its formulation without having the hassle and financial burden of operations throughout the world.

Despite the logic of licensing and royalty payments, there are problems with such arrangements between firms, which is why they are much less common than foreign direct investment. One can envision some of the problems from the above example. The U.S. company may be concerned that the local company will not be adept at maintaining product quality or extending marketing activities for the product. The full market potential might not be realized for the product and the U.S. company would then lose potential profits (particularly since many foreign companies do not have the marketing expertise of American companies). More importantly, the U.S. company may fear that its partner in the host country will copy the formulation and stop making royalty payments. If this occurs, there will be a legal battle that will be fought in the host country, where the local firm has an advantage over the U.S. firm.

The U.S. company may find it impossible to negotiate a "fair" agreement where it is compensated for its formulation. Markets are imperfect and there is a lack of information in many markets. This might cause the negotiated royalty payments to be small relative to the return the U.S. company foresees in exploiting the advantage internally. Finally, the U.S. company may incur increased transactions costs in dealing with a separate firm in each host country rather than having its own affiliate in the country. If the parent is dealing with an affiliate, more information can be shared to improve operations in the home and host countries, a common marketing strategy can be adopted, and needed adjustments can be handled more smoothly.

Dunning argues that the costs of exploiting most ownership advantages are often near zero in host countries (though that is not likely true in some difficult, less developed country), so it doesn't take much of an increase in transactions costs or risk in technological or patent seepage to encourage the MNE to invest in a country, rather than sell its advantages. There are examples, though, of advantages that are licensed. Two of the most famous U.S. examples are Coca-Cola and McDonalds. Coca-Cola licenses its patent rights throughout the world, but it protects its formulation by producing the syrup exclusively in company-owned facilities. McDonalds sells franchises throughout the world, but assures quality through contract specifications. Generally, the more complex the MNE's advantage, the more likely it will exploit the advantage internally (Dunning).

Internalizing the firm's advantages might also result in lower costs or help them compete in the home market. The parent and affiliates can share in certain production and distribution costs, such as research and development, advertising, and so forth. These cost savings are derived from economies of scope, where the firm has lower costs per unit by taking on these extra activities. There are many examples of firms with broad product lines and distribution networks that have been aggregated to lower costs. FDI is simply another way of



expanding the firm to take advantage of these lower costs. Even if the MNE's costs are not lower from FDI, some argue that the MNE can use profits from overseas operations to combat their rivals in the home market.

One final word about FDI involves the dynamic nature of globalization. It is not unusual for a firm to reach international markets through exporting initially, because the risks are lower and the fixed costs of exporting are low relative to direct investment. However, as international sales increase, the firm incurs lower cost by taking the risk of the large fixed costs, but lower variable costs, of direct investment (Rugman). In this sense, FDI is the maturation of a firm's internationalization process.

## Costs and Benefits of FDI

A globally integrated capital market is the result of the world realizing that investment flows (in portfolio and equity form) among countries is beneficial to all. Increasingly sophisticated companies in an information- and technology-intensive world will exploit their advantages whether or not governments desire it. Governments have realized that many regulations on FDI flows only serve to isolate the country from the rest of the world and therefore slow technological diffusion into the host country. Simply put, the home governments realize that they cannot easily keep their MNEs from investing abroad and host governments realize that it is in their best interest to allow MNEs to enter.

The benefits from FDI to the host country are easier to see than the benefits to the home (sending) country. When an MNE decides to build a plant in the host country, there are immediate employment and income gains from the production process. These gains will have direct and indirect benefits that filter throughout the economy. More importantly, though, is the new technology, management, and competition that the MNE brings. Some of these benefits will spillover to other companies in the host country and improve the management and operations of those companies. There will often be increased demand for skilled workers at the new facility, and on-the-job training that comes from the new plant's employment practices will significantly increase the job skills of the existing labor force.

Many potential host countries for FDI had discouraged MNE entry in the 1960s and 1970s because they felt that the MNEs were "buying up assets of the country" or "obtaining undue political influence" through their activities. Entry of a foreign firm was viewed as a loss of national sovereignty and it hurt national pride. In the late 1980s and early 1990s, many countries, particularly in Asia and Latin America, realized that this attitude was keeping new ideas and technologies out of their country, promoting a very inward-looking industrial structure that was not very efficient in delivering modern goods and services [38]. The domestic market structure in these countries was not very competitive, and the countries decided that FDI could immediately force their domestic companies to become more efficient and cognizant of consumer desires.

The United States is a classic example of the benefits of hosting FDI. There was a great controversy in the late 1980s because many state governments in the U.S. would provide lavish incentives for foreign MNEs, particularly automobile manufacturing facilities, to locate a plant within the state. The governments might provide infrastructure improvements, tax holidays, and other benefits associated with the FDI. The state of Kentucky provided \$150 million of incentives for the Toyota Manufacturing Company to locate in Georgetown in 1986. This is clear evidence that states view FDI as tremendously beneficial for economic development. Countries often have a less visible bidding process, but it is clear that MNEs in certain industries with large-scale, technology-intensive production facilities often receive incentives to locate in particular countries or regions.

The benefits to the sending country are less clear and probably less pronounced. The parent may export products to the affiliates so employment and income in the home country could increase. These benefits will naturally be counteracted by any importing of products from affiliates that were previously produced by the parent. It is possible that the MNE will learn things from its affiliates that it can transfer back to the parent operations to make production more efficient. Finally, equity investors in the MNE, which probably are highly represented by citizens of the home country, will find that the returns from their investment will increase if the affiliates are successful, increasing the home country's income.

A key to the benefits of outbound FDI for the home country is the relationship between FDI and international trade. An early conceptual piece on FDI viewed it strictly as a substitute for trade in the sense that firms chose to invest in host countries instead of exporting to those countries (Mundell). This type of FDI is called *horizontal* -- the MNE performs the same type of activities in the host country as in the home country. If that is the case, there are job losses in the home country due to a drop in exports.

A more realistic view of world trade, though, recognizes that trade in intermediate products is very important and that parents can spin off some production to other countries to make their home country activities more internationally competitive. This is what happens in *vertical* FDI, where the host country activities are used as inputs to or outputs for activities in the home country. In this case, FDI could result in increased exports from the home country even before host country income effects are included. Further, MNEs have diversified product lines so that production facilities in a host country for some products could stimulate demand for other product lines produced exclusively in the home country. FDI could be viewed as synergistic in this multiproduct view, resulting in increased home country exports. The relationship between FDI and trade, though, is still a hotly debated issue.

Despite their effects on home country exports, in most countries MNEs are allowed to follow fair business practices outside their home countries without restriction. There is little that the home country can do to discourage its MNEs from investing internationally in a free market economy. FDI is one of the strategies that MNEs can use to help them maximize profits over all of their operations. Competitive forces will drive MNE decisions, and there is little that the home country can do to thwart outbound FDI.

*Discussion Box 12.1 Examples of Restrictions on MNEs.*

*Some restrictions are placed on MNEs that restrict their business practices. For instance, it is illegal for any company with operations in the U.S. to bribe public officials in a foreign country. It is also illegal for any company with operations in the U.S. to have any dealings with entities in Cuba (though the law is under review). While controversial, restrictions like these are sometimes imposed on MNE behavior. Before 1971 the Ministry of International Trade and Industry (Japan) had a stated policy that no Japanese worker could be displaced due to Japanese FDI (Bergsten, Horst, and Moran).*

## Foreign Direct Investment in Food Industries

It is difficult to obtain information about the operations of multinational food firms. Most firms only report what is required through their registration with stock exchanges and governments (such as 10-K reports required by the U.S. Securities and Exchange Commission). Sales data are easy to obtain for firms that have their common stock traded on most exchanges, but determining sales by country or product flows among subsidiaries is impossible now. Food sales by companies that sell many products are not included because they are not classified as food firms or their food sales are not broken out. Walmart is the largest food retailer in the world (with sales of over \$250 billion per year), but it is not included as a food multinational (MNE). So this section will focus on sales of food firms that are classified as food firms and have publicly-available data.

The top fifteen food and beverage processing firms in the United States and Canada are listed in Table 12.1. Most of these are familiar names but they are not all U.S. companies. Nestle, JBS, and Anheuser-Busch InBev are multinational with home offices in Switzerland, Brazil, and Netherlands, respectively. Smithfield Foods was recently purchased by the Shineway Group (China). Pepsico, which leads in sales, has many snack foods in addition to its beverage lines. Two of the companies, Mars and Cargill, are private companies so their sales are estimated. It can be difficult to keep track of what brands are owned by various companies. Anheuser-Busch was purchased by InBev in 2008. All of these sales were from plants in the United States or Canada, but most of these firms have operations throughout the world.

**Table 12.1 Sales of the Top 15 Food and Beverage Processing Companies in the United States and Canada (2013) in billion dollars.**

Company	Food/Beverage Sales
	1. Pepsico \$ 37.8
2. Tyson Foods	\$ 33.0
3. Nestle (USA & Canada)	\$ 27.3
4. JBS USA	\$ 22.1
5. Coca-Cola	\$ 21.6
6. Anheuser-Busch InBev	\$ 16.0
7. Kraft Foods	\$ 14.3
8. Smithfield Foods	\$ 12.5
9. General Mills	\$ 12.5
10. ConAgra Foods	\$ 11.5
11. Mars	\$ 11.0 <sup>1</sup>
12. Kellogg	\$ 9.7
13. Dean Foods	\$ 9.0
14. Hormel Foods	\$ 9.0
15. Cargill	\$ 8.5 <sup>1</sup>

<sup>1</sup> Estimated because they are private.

Source: Food Processing (<http://www.foodprocessing.com/top100/top-100-2014/>)

Foreign food and beverage firms with operations in the United States have a large impact on the economy. In 2012 they had sales of \$106 billion in food and \$34 billion in beverages; they employed 258,000 people; and had assets of \$227 billion. These companies provide food for people in the U.S. but they also export food from these affiliates. In that year exports of processed foods from these affiliates were \$9.1 billion while exports of beverages were \$1.6 billion.

The world food market is huge and the world-wide sales of MNEs reflect this. Nestles has sales of almost \$100 billion, almost four times its sales in the United States. Six of the fifteen largest food MNEs in the world are American (Table 12.2). Pepsico has almost as many sales outside the United States as within. Yet it is still behind Nestle and Archer Daniels Midland, which is a grain handling and processing companies with operations in nearly every country. Bunge is another grain handling and processing company. Mondelez

International manufactures a host of chocolate, snack, and other brands (Cadbury, Dentyne, Gevalia, Milka, Nabisco, Oreo, Ritz, Tang, and Triscuit).

Activities of U.S. food MNEs are huge and growing. In 2005, there were 504 majority-owned affiliates of sixty-seven U.S. food MNEs with assets of \$98 billion, sales of \$111 billion, and 416,000 employees (Bureau of Economic Analysis, BEA) [39]. By 2012 there were 613 majority-owned affiliates with assets of \$234 billion, sales of \$226 billion, and 465,000 employees. The gross value added of these affiliates for 2012 was \$36.8 billion and the sales from these affiliates were approximately four times the value of processed food exports from the United States. These U.S. affiliates imported \$7.4 billion from the U.S. and exported \$14.1 billion back to the U.S. It is well-known that most of this FDI is horizontal in nature (they perform the same activity in their parents and affiliates) and most of the output from U.S. affiliates is sold in the host country (Handy and Henderson).

**Table 12.2 Sales (in billion dollars) and Country Headquarters of the World's Largest Publicly-Traded Food and Beverage Processing Firms, Latest Fiscal Year.**

Company	Country	Food/Beverage Sales
		1. Nestle S.A. Switzerland \$ 99.4
		2. Arch. Dan. Mid Co. USA \$ 89.7
		3. PepsiCo USA \$ 66.4
		4. Unilever UK/Netherlands \$ 66.1
		5. Bunge USA \$ 61.4
		6. Coca-Cola USA \$ 46.3
		7. Wilmar Int. Singapore \$ 44.1
		8. Anheuser-Busch InBev Belgium \$ 43.2
		9. JBS Brazil \$ 43.0
		10. Mondelez International USA \$ 35.3
		11. Tyson Foods USA \$ 34.8
		12. Danone S.A. France \$ 28.3
		13. Heinekin Holdings Netherlands \$ 25.5

14.	Kirin Brew. Japan \$ 23.1
15.	Associated British Foods UK \$ 20.8

Source: Forbes On-line (<http://www.forbes.com/global2000/>) on February 6, 2015

Most of these affiliate sales (\$88.3 billion) happen in Europe, with \$65.1 billion in Latin America, \$36.0 billion in Asia. The leading individual country for U.S. MNE food sales in Canada, with \$32.4 billion, followed by Brazil (\$31.2 billion), Germany (\$16.8 billion), United Kingdom (\$15.5 billion), Mexico (\$13.8 billion), and Netherlands (\$13.5 billion). U.S. MNEs choose countries with factor endowments similar to the U.S. for their affiliates, rather than locating in lower income countries where factor costs, especially labor, are lower. Research has shown that host country market size, tax policies, and exchange rate differentials are important determinants for the location of U.S. FDI in the food industry. Wages in the host country are not significant determinants of U.S. FDI patterns (Ning and Reed).

U.S. beverage firms are also active foreign investors with 292 affiliates from sixteen U.S. multinationals. Their assets totaled \$242 billion in 2012, and their sales were \$91 billion. Many U.S. beverage MNEs did not own a majority of the affiliate (BEA reports data for all affiliates and majority-owned affiliates), indicating that they are often joint ventures (probably with local companies). These affiliates employed 258,000 employees and had gross value-added of \$62 billion, quite a bit more than the value-added for food processing firms. The growth in U.S. beverage MNEs has also been higher than for food processors since 2005.

#### *Discussion Box 12.2 MNEs are Important in Trade Negotiations Too*

*A trade dispute pitting the U.S., Ecuador, Guatemala, Honduras, and Mexico against the E.U. demonstrates the importance and power of U.S. MNEs. In 1993, the E.U. adopted policies which allowed bananas imported from past English and French colonies in the Caribbean to have greater access and a lower tariff than bananas imported from Central and South America. This sharply limits access of these bananas to an important market. The five countries above filed a petition with the WTO for the E.U. to change its banana import regime – not to equalize the preferences among Caribbean and Central/South American countries, but at least to lower the distortions.*

*One might wonder why the U.S. is involved in this case, since the U.S. exports no bananas and is a large importer. The link is that two U.S. multinational companies, Dole Foods and Chiquita Brands, have huge investments in the Central and South American banana industries. Their business is hurt because it is very difficult to export bananas to the E.U. because of those preferences.*

*The WTO agrees with the position of the U.S. and other countries. It has ruled against the E.U. three times and the E.U. continues to stall through legal maneuvers to delay further liberalization. In December 1998, the U.S. requested the right to withdraw \$520 million in trade preferences (or increase tariffs to generate tariff revenue of \$520 million) on various E.U. goods if they did not follow the WTO ruling. The panel came back and said that the U.S. could withdraw \$191 million in trade preferences if the E.U. did not liberalize further. At this writing, the preferences have not been withdrawn, but it is clear that U.S. trade policy is meant to preserve market access for U.S. exporters and MNEs.*

There has been some analysis of the conditions under which food firms become MNEs and what factors determine their size and success. Reed and Ning, in their analysis of thirty-four U.S. food processing companies, found that the ones that became multinational were more capital-intensive firms that had extensive, diverse product lines. Moving into the multinational arena was a means to exploit those advantages. Once the firms became multinational, these same factors positively influenced their size. The study also found that MNEs which spent a higher percentage of their budget on marketing tended to be larger, while MNEs which spend a higher percentage of their budget on research and development tended to be smaller. These two later results would indicate that MNEs have strong brands that they would like to exploit, but they do not tend to have large R&D budgets that are developing new products where ideas might leak to other countries.

Henderson, Voros and Hirschberg used a 144 firm sample of food firms from throughout the world in their analysis of MNE behavior. They found that smaller firms tend to export, while larger firms tend to invest to reach foreign markets; more specialized firms tend to export, while more diversified firms tend to invest; and firms with a large domestic market share are more likely to invest than export. They concluded that firms were investing abroad to exploit brands and corporate goodwill, especially non-U.S. firms, and that non-U.S. MNEs tended to export a higher percentage of their production than U.S. MNEs.

American-owned restaurant chains have spread throughout the world and are an important area of FDI for the U.S. food industry. Six of the top seven restaurant chains are from the United States and they are familiar names. In 2013, McDonalds was the world's leading restaurant chain with sales of \$28.1 billion, but this figure hasn't grown much in recent years (sales were \$26.0 billion in 1994). The sales figures for restaurant chains in Table 12.3 include company-owned firms and franchisee-owned establishments, but this is indicative of the MNE's international presence. Other important U.S.-owned restaurant chains, such as Starbucks, Darden, and Chipotle have grown faster. Yum Brands includes KFC, Pizza Hut, Taco Bell, and A&W, all of which have a large presence outside the U.S., but they haven't grown rapidly in the last decade. Compass Group is an institutional food provider for hospitals, schools, and other facilities in the United Kingdom and other parts of Europe. It has little brand recognition. Tim Hortons was recently purchased by Burger King, so it is now within a U.S. company.

**Table 12.3 Leading Companies in Restaurant Sales (in billion dollars).**

Company Sales	Country	Total Assets	Total
McDonalds	US		
\$28.1		\$36.6	
Compass Group	UK		
\$27.4		\$14.8	
Starbucks	US		
\$15.3		\$10.3	
Yum Brands	US		
\$13.1		\$ 8.7	
Darden	US		\$
8.7		\$ 7.2	
Chipolte	US		\$
3.2		\$ 2.1	
Tim Hortons	Canada		
\$ 3.2		\$ 2.3	

Includes sales from franchisee-owned establishments

Source: Forbes On-line (<http://www.forbes.com/global2000/>) on February 6, 2015

Foreign-owned restaurant chains used to be more important in the United States. Baskin-Robbins, Burger King, Dunkin Donuts, and Hardees were owned by large foreign corporations in the early 2000s, but they have been purchased by private equity groups in the U.S. and are based in the United States. The U.S. is certainly the leader in franchising casual, fast-food dining. It might surprise you that the restaurant chain with the largest number of establishments in the U.S. and the world is Subway (Table 12.4); yet its sales are dwarfed by McDonalds, which has the second largest number of establishments in the world (and the most outside the U.S.). Subway is a private company so they do not publish sales figures but it is estimated that their sales are around \$12 billion. McDonalds and KFC have more international establishments than U.S. establishments. The vast majority of Tim Hortons locations are in Canada and almost all Wendys locations are in the United States and Canada (though they do not break this number out in their annual report).

**Table 12.4 Number of Establishments (US and International) for the Leading Restaurant Chains (in billion dollars)**

	US	International	Total
Subway	26,617	15,610	42,227
McDonalds	12,757	16,237	28,994
Starbucks	11,962	11,406	23,368
KFC	4,285	9,561	13,846
Burger King	7,155	6,512	13,667
Pizza Hut	7,355	5,601	12,956
Dunkin Donuts	7,821	3,168	10,989
Wendys			6,545
Tim Hortons	869	3,700	4,569
Papa John's	2,529	1,227	3,756

Source: Forbes On-line (<http://www.forbes.com/global2000/>) on February 6, 2015

There has also been rapid growth of FDI in food distribution and food service throughout the world. Tesco is the leading food retailer in the world with sales of \$100 billion (Table 12.5). They are closely



followed by Carrefour (French) and Kroger (US). There are more leading companies outside the U.S. in distribution and retailing, suggesting that non-U.S. companies have advantages in merchandising food products. Yet some of these numbers could include non-food business (especially for Wesfarmers and Woolworths). This list does not include Walmart, whose food sales would be much higher than Tesco's if they were broken out. Walmart has struggled, though, in many international markets with its food and non-food businesses.

**Table 12.5 Sales of the Leading Food Retailers in the World and their Home Office.**

Company	Country	Sales
		1. Tesco
		UK
		\$100.6
		2. Carrefour
		France
		\$ 99.4
		3. Kroger
		US
		\$ 98.5
		4. Wesfarmers
		Australia
		\$ 58.5
		5. Woolworths
		Australia
		\$ 58.3
6. Seven and I Holdings	Japan	\$ 57.3
7. Sysco	US	\$ 45.5
8. Royal Ahold	Netherlands	\$ 43.4
9. Safeway	US	\$ 37.6
10. J. Sainsbury	UK	\$ 37.2

Source: Forbes On-line (<http://www.forbes.com/global2000/>) on February 6, 2015

## Summary

1. A multinational enterprise is a firm with an ownership presence in more than one country. The companies that the MNE owns outside its home country are affiliates (foreign subsidiaries) of the MNE.
2. The value of FDI among countries reached \$1.3 trillion in 2013 – multiplying by over 20 times in less than 30 years!
3. It is estimated that the stock of FDI reached \$22.8 trillion in 2012, more than merchandise trade for that year, which totaled \$18.9 trillion.
4. There are three advantages for a firm to become multinational – ownership, location, and internalization (OLI). Ownership advantages are firm-specific aspects that make the firm able to produce less expensive or superior products. Locational advantages mean that there are input cost or quality advantages that are available in foreign countries. Internalization advantages are aspects of the firm that make it necessary for the firm to control the means of production, rather than to license or sell its ownership advantages to others.
5. MNEs benefit the host country by providing jobs, technology, management expertise, and increased competition. MNEs benefit the home country by allowing the firm to learn from its affiliates, to concentrate its high-valued activities in the home country, and to provide inputs to the foreign affiliates.
6. Foreign food and beverage firms with operations in the United States had sales of \$106 billion in food and \$34 billion in beverages; they employed 258,000 people; and had assets of \$227 billion in 2012.
7. U.S. food MNEs are huge and growing. In 2012, these firms had 613 majority-owned affiliates with assets of \$234 billion, sales of \$226 billion, and 465,000 employees. The gross value added of these affiliates for 2012 was \$36.8 billion and the sales from these affiliates were approximately four times the value of processed food exports from the United States.

## Questions

1. What factors might cause U.S. food exports to grow more rapidly in the future than U.S. direct foreign investment in the food industry?
2. MNEs seem to be getting larger through mergers and acquisitions. Are there reasons that this trend might not continue in the future? Why or why not?
3. What are some ownership advantages that a U.S. biotechnology firm might possess? Why might the firm want to exploit them through foreign direct investment?
4. Should there be restrictions on incentives that state and local governments use to attract foreign companies?
5. Why might an MNE argue against WTO negotiations and trade liberalization?
6. Investigate the nationality of some agricultural firms in your area. Why do you think they chose to locate a facility in the U.S.?

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## Chapter 13 Competitiveness in Agricultural Markets

Classical trade theory and the gains from trade indicate how a country, in aggregate, will be better off with trade. Resources will flow out of industries within a country where producers are relatively less productive and move into industries where producers are relatively more productive. Relative prices and the production possibilities curve are the key to understanding these gains from trade and the movement of resources from one industry to another.

Textbooks on classic trade theory spend much time on what impact trade has on resource returns (particularly wages and returns on capital) and terms of trade[40]. These books spend little time on the firms that underlie this theory, even though some firms succeed and some fail in each industry. This is characteristic of much economic theory -- it does a good job of explaining equilibrium, but a poor job of explaining how different firms can face the same output, input, and other markets, yet one firm will be profitable while the other firm will not. One might argue that economists assume away much of the problem in firm and industry success because a common assumption is that firms are identical.

This chapter covers the relatively new literature on international competitiveness, which has more of a business school foundation, is an attempt to explain why some nations become the home base for very successful industries and not others. In this analysis, countries themselves are not competitive, but specific industries are competitive within a country. Resources will shift among industries, as classical trade theory indicates, so that there are some competitive industries, but the analysis focuses on the characteristics of those competitive industries and how they develop. Competitiveness also attempts to explain the greatly enhanced role of multinational enterprises (MNEs) in international trade and foreign direct investment. Porter is the leading author in this area and agricultural economists have recently attempted to use his concepts in agricultural markets[41].

## The Roots of Competitiveness

The theory on gains from trade would imply that most trade would be between countries with significant differences in factor prices (wages, interest rates, land prices, etc.). However, the reality is that most trade is among more developed countries that have similar labor and other endowments. Trade theory, until very recently, focused on undifferentiated products that were produced by firms with identical technology and no scale economies. Factor pools were fixed and relatively homogeneous (low-skilled labor was about as detailed as economists would get).

The world is much different that portrayed in the general theory of trade. Technology has given firms the power to overcome scarce resources (this is the concept of induced innovation, which was first observed in agriculture by Hayami and Ruttan). Firms are constantly changing their products to gain new customers. The demand for specialized labor skills is becoming increasingly important and specialized educational opportunities have allowed labor skills to advance rapidly as employer needs change. MNEs are increasingly important in trade and investment, presumably because of economies of scope. Porter captured these trends in his concept of competitiveness.

The competitiveness paradigm begins with the idea that nations become rich because they experience sustained increases in productivity (for labor, capital, and other input factors). Their residents have highly productive jobs that pay well; their industries make profitable investments that bring handsome returns; and their regulations establish rules that help firms become more focused and productive. All of these situations generate high national income. These rich nations have competitive industries and firms that can afford to pay their employees well because they are highly-productive employees, producing the best products available. The country has somehow created an environment where its industries create advantages that overcome any hindrances caused by nature (climate, natural resources) or man (regulations, population pressure).

For a country, this means that the development process should be such that there are firms and industries in the nation that are continually expanding their production and exports from these highly productive firms and industries. These industries will pay their workers a higher wage because they are more productive and will attract investment because the returns are high. Yet, this very process will make other industries less competitive within the country because those industries cannot match the factor returns (especially wages) from the industries that are expanding. This process makes economic sense -- the only way these firms and industries can expand (since the overall labor pool is relatively fixed) is by shifting resource towards industries that are becoming increasingly productive and shifting resources away from less productive industries to other countries through foreign direct investment or imports. The firms in these less productive industries will either go out of business or will shift most of their operations to other countries.

An early dynamic theory of trade that can explain this shifting of resources to foreign locations is the product life cycle theory developed by Vernon. In the first stage, a firm develops a new product (or a new technology to produce an existing product) and sells it in its home market. In the second stage, as information and technology diffuse, the product is manufactured by foreign companies, restricting the market for the original, innovating company. In the third stage, lower-cost international companies make it impossible for the original firm to export the product at all. In the final stage, the original company cannot manufacture the good in the home country because it cannot compete with low-cost imports. During this process, the foreign production facilities, though, can be owned by the original company through foreign direct investment. Thus, the company itself could be manufacturing the product in many countries, but the home country's production would likely be falling after the first stage.

The MNE is a pivotal to the competitiveness paradigm because these firms, with operations in more than one country, specialize in producing and distributing differentiated products using highly productive processes. These companies lead the world in production, management and marketing in their respective industries. They are key in helping increase the income levels of their home country and keeping their home country competitive. There are generally two measures of competitiveness for a firm or industry in this framework: the amount of exports and outbound foreign direct investment.

The nature of competition in the home country is crucial in preparing firms for the international market. Specifically, if an industry has many firms that compete rigorously within the home market, the industry will be more internationally competitive. If firms in an industry face threats of new product introductions, new firm entrants, and much rivalry among current competitors, then they will be better able to face new competition in the future. If the firms have been forced to deal with very discriminating, fastidious buyers of its products that force the firms in the industry to make constant changes to meet customer demands,

then the firm is at an advantage. If the firms can purchase its inputs in markets that are characterized by fierce competition among suppliers where there is constant innovation in inputs, the industry is at an advantage. All of these factors may make it difficult for individual firms to survive, but it forces them into a mentality such that they are accustomed to such behavior among suppliers, buyers, and competitors that force firms to constantly consider new ways of doing business.

Porter argues that firms can compete/succeed on two bases. The first is that the firm can compete by supplying the lowest priced product. The market is well established and the firm's output is not significantly distinguishable from other products. Thus, the firm is competing by designing, producing, and marketing the product in the most efficient manner. As long as this results in lower costs than other competitors, the firm will thrive and be competitive. Ultimately, the firm can survive any price cuts that come because it has lower production costs than any other company.

A low-cost strategy is difficult because new firms can often imitate the production process of the firm and cut their production costs over time. With increased globalization, there are always countries where labor costs are low and labor skills have improved enough to begin production of the product. If the production process is not exceptionally complex, the firm will not only face competition in its home market, but increasingly face competition in markets with lower labor costs. A technological treadmill can develop such that cost-reducing technologies are developed continually, but producers do not benefit from the new technologies because output prices adjust quickly. Cochrane argued long ago that this is the case in U.S. agriculture. As one can imagine, staying the low cost producer is no easy task and requires constant investment in cost-reducing technology.

The second way to compete is on the basis of a differentiated product that caters to specific market segments. In this way, the firm distinguishes its output from that of all other firms so there is less pressure to constantly cut production costs. Granted, there may be other firms that produce similar products, but those products are not identical, so price competition is lower and the firm has more ways to keep existing customers and encourage new customers. Product differentiation provides more durable advantages, but it normally requires constant upgrading of products, technology, and labor skills. The firm cannot stay with the same product too long or other firms will catch up. This strategy requires constant investment to assure that the firm's products are differentiated.

As the world has become more integrated and barriers to trade and investment between countries fall, firms no longer are constrained to their home market. Firms can exploit their strategies globally by exporting or investing to reach international markets. Information systems are exceedingly advanced and low-cost so firms can reach these markets with increasing ease. Depending on economies of scale in production, economies of scope in marketing, transportation costs, trade barriers, differences in local needs and other factors, firms can decide between keeping production in their home country and exporting to others, or investing in production facilities in another country.

These firm-level decisions have important consequences for the home country and its economic well-being. If countries understand what makes these firms highly competitive, then they formulate policies, establish regulations, and make investments that will lead to more highly productive workers, higher national income, and increased exports and out-bound foreign direct investment. At a minimum, governments must help create an environment for their competitive firms and industries to succeed over time. Otherwise, many countries face the prospect of stagnant or declining industries and lower national income. As will be seen, having vibrant, competitive industries does not mean that there are not problems to be overcome, but the resulting industrial structure is much better than the alternative.



## Porter's Four Diamonds

How can the home country provide an environment that stimulates its firms into becoming internationally competitive companies that constantly upgrade their products and skills so that they generate high income levels and returns on investment? Obviously, the home country must have markets that are dynamic, challenging and discriminating so that its firms are accustomed to an environment that forces them to upgrade or lose market share. The home country must focus on products that have all the ingredients of success for an industry, and the dynamics to sustain that success. This doesn't sound easy, but one can imagine that these factors are needed to meet the demands of the ever-changing, fussy consumer.

Porter classified the environment for success into four areas: factor conditions, demand conditions, related and supporting industries, and firm strategy, structure and rivalry. Each of these areas has aspects that are relevant for a particular industry in a particular home country. Sometimes one area is more important than another, but usually successful firms and industries have positive aspects associated with all four areas. Each area is discussed separately.

### Factor Conditions

The basis for the general theory of comparative advantage and gains from trade is the existence of different factor pools among countries. Countries that are land-abundant export land-intensive products, while countries that are labor-abundant export labor-intensive products. The competitiveness paradigm recognizes that factor abundance and endowments are important, but the paradigm views these factors in much finer gradations and posits that factors are not simply endowed, they are developed. The development of higher skilled labor, in particular, is a key element of competitiveness.

Porter classifies factors as basic or advanced. Every country has basic factors, but there is little investment that can be made to change them. These factors are often inherited. Among the basic factors are natural resource endowments, climate, location, and the amount of unskilled and semi-skilled labor. Certainly there is nothing that a country can do to change its location (though investments can be made to overcome some locational disadvantages) or climate. Unskilled and semi-skilled labor pools can be changed and upgraded, but in many countries, these endowments are determined by birth and death rates. These basic factors are rarely important in competitive advantage because they are not necessary for a specific industry or are widely available.

Advanced factors are scarcer and require large, sustained investments for development. It is these advanced factors that determine striking differences in competitiveness among countries. Advanced factors include the transportation infrastructure, communications system, number of college graduates, number of research scientists, number of engineers and computer scientists, and other highly skilled workers. Notice that many of these advanced factors come from investments in basic factors (often yesterday's advanced factors are today's basic factors). In fact, the advanced factors can be used to overcome hindrances from the basic factors.

These basic and (particularly) advanced factors that reside in a country are crucial to the general economic success of a country. They set the stage for development of successful industries that will generate much value-added and wealth so that firms can pay high wages for their skilled employees. Yet these basic and advanced are not generally associated with individual industries. They exist because of government or personal investments which can then be used by industries to produce goods and services. In a sense, they are generic factors that can then be molded into specific factors that are used in competitive firms and industries.

Another way of categorizing factors is between generalized and specialized factors. Generalized factors can be employed in many industries, yet can be important for success. A well-developed telecommunications system and other infrastructure, a large percentage of college graduates, a well-functioning financial system, and other factors are important in making many industries more productive. Yet, these factors are accessible and necessary for virtually all industries.

Factors that are molded for specific industries are labeled as specialized factors. They would include narrowly-skilled people, specialized infrastructure, or other specific capabilities that are related to an individual industry. The development of these specialized factors is riskier than other factors because they are associated with specific industries, and those industries can fail despite substantial investment in factors. Often these investments in specific factors are done by the government, by specialized educational firms, by the

industry, by the firms themselves, or some combination. The existence of these specialized factors is essential to the development of competitive industries. Their existence also makes resources difficult to move from one industry to another – hence there is entrenched loyalty to existing industries and sometimes great demands for protection as market conditions change.

Competitiveness based on basic and generalized factors can be fleeting because these factors are natural outcomes from the development process. As countries develop, they increase the quantity and quality of their basic and generalized factor pools, allowing them to compete effectively in more advanced industries. This causes severe problems for nations because their industries are continually subjected to competition from nations moving up the development ladder. If given enough time, nations also find ways to overcome their disadvantages in basic and generalized factors through innovations that save labor, reduce the effects of climate, control space utilization, and require fewer natural resources. Because of the ephemeral benefits of these lower-order factors, it is important for the industry to have advanced and specialized factors to give it an edge.

One can view the colleges of agriculture in land-grant universities as one place where specialized factors are developed. The output of B.S., M.S. and Ph.D. degree-holders provide firms with highly-skilled individuals that help U.S. agriculture remain competitive relative to the agricultural industries in other countries. The research and extension activities from the U.S. Department of Agriculture and the Land-Grant System also provide improved factors that enhance agricultural competitiveness. These investments in colleges of agriculture come from the individual students, state and federal governments, and private firms.

### **Demand Conditions**

Having the right people and other resources to develop, manufacture and market products is very important in today's environment, but it is only one piece of the puzzle. Competitive companies must have ways of knowing the present state of consumer wants and needs, but it is also important to be skilled at predicting future consumer desires. Sophisticated buyers that lead the world in demanding highly differentiated products confer dynamic benefits to industries in their home market. They provide a clearer picture of buyers needs and entice industries to design and produce innovative products that will meet those demands. The firm that comes up with the next consumer craze (whether it be the latest doll craze, faster computer chips, or some other product) is sure to be quite successful. Often these consumers demand very specialized goods that meet narrow market segments, but those narrow product segments are exactly where many world consumers will be in the years ahead.

An important way for an industry or firm to anticipate future desires is to have consumers that are discriminating and dynamic that provide constant feedback on products. If a company is selling in a market that constantly demands improvement in product quality or new features, then the firms that sell in that market will be forced to meet those consumer demands by constantly changing product features. When those companies sell in international markets, which may have consumers that are less discriminating and therefore firms that are less accustomed to constant product upgrading, then these new products will sell very well.

There are many examples where countries have leading industries because of consumer demand patterns. The U.S. leads the world in the aircraft industry because of its discriminating customer -- the U.S. Defense Department. Many innovations for the defense industry have spinoffs for the civilian aviation industry that are very positive. Americans have also always been in love with air travel and the distances between many spots in the U.S. make it natural for the U.S. to lead technologies and infrastructure related to air travel (airplane design, airport design, safety regulations, and competitive regulations).

Japanese consumers are known for very discriminating tastes with respect to electronics and tend to demand features that others cannot imagine. Part of the reason is that Japanese young people, especially women, tend to spend more years at home living with their parents, despite having a well-paying job. Housing rents in Japan are very high and there is a stronger family orientation in Japan than in the U.S. or Europe. These young people living at home have money to spend on expensive stereos, cameras and other electronic equipment, so they demand the latest, high-tech features.

Porter argues that the product life for electronics products in Japan is only six months (versus 12 months in other countries), because Japanese consumers are very conscious of the latest gadgets. Thus, Japanese manufacturers must constantly upgrade their electronic equipment to compete with other Japanese companies. These Japanese manufacturers can take these products that are considered outmoded in Japan and sell them in export markets for a longer period of time, making them very difficult competitors in the world electronics market. In fact, the short product cycles in Japan force their firms to export in order to capture research and development expenditures on the new products required for the home market.

Americans seem more sophisticated relative to computers and information networks. The popularity of personal computers in the office and at home, coupled with the internet, has vaulted the U.S. into the lead in computer hardware and software. Investments that have been made in development of the internet and the information superhighway have supported this computer craze. Americans are also leaders in finance because our consumers are accustomed to making purchases on credit; and in risk-reducing enterprises such as insurance and futures markets because free enterprise (and the freedom to have financial losses) is such an important part of the American economy. Risks are higher in the U.S., so institutions have developed to reduce risk exposure for firms and individuals.

With respect to the food industry, the Europeans were the leaders for many years because of the long tradition of food quality in the continental cuisine (wines, sauces, cheeses, breads, etc.). However, in recent years, the Americanization of food consumption patterns (convenience foods with little time for preparation, fast food consumption, etc.) throughout the world has increased the competitiveness of the U.S. food industry abroad. The popularity of American-style fast food chains has reached throughout the world and the influence of U.S. food companies has been enhanced through these trends.

Dynamic, discriminating consumers in the home market make it possible for the firm to anticipate what the future will hold for the rest of the world. There is no question that such consumers will give domestic firms an advantage over their international competitors, assuming that they listen to those consumers.

## Related and Supporting Industries

Today's consumers demand increasingly complex products that move through numerous production and marketing stages. Often firms find that it is best if some of those production or marketing stages are performed by other companies -- firms are less likely to be fully integrated from raw materials to final retail distribution. In such a world, the firm must rely on other industries to support its activities through supplying high-quality inputs and maintaining or enhancing quality of the firm's output. If the firm allies itself with upstream and downstream industries that are sub-par, this will make the firm less competitive. Whatever the relationship structure among firms in the marketing chain, there must be highly developed coordination so that there can be a continual process of innovation and upgrading to maintain the industry's advantages.

### *Explanation Box 13.1 Upstream and Downstream Industries*

*Upstream and downstream industries relate to firms at different stages in the marketing system. The definitions go back to the early days when firms used waterways to transport products, so that products flowed downstream. Upstream firms concentrated on providing raw materials and transforming them into intermediate products. Downstream firms transformed those raw and intermediate products into consumer-ready products. Thus, upstream firms are input-suppliers and downstream firms are purchasers of the product for additional processing.*

The best situation is for the firm to ally itself with the world's best input suppliers (delivering the best products rapidly at a low price). The suppliers should work with the firm to develop processes and products that would improve product quality and distinguish the firm's output from all other outputs. Communication flows between the firm and its suppliers improve the process of product innovations.

### *Discussion Box 13.1 ISO 9000*

*One way that organizations (or firms) can become more competitive is to participate in the International Standards Organization (ISO) 9000 program. The ISO has been developing voluntary standards and guides for many years, but the 9000 program began in 1987. It is a set of generic management system standards that helps an organization manage its processes or activities; something like a best management practices program. Organizations often have written procedures and instructions about how business is performed so that information flows smoothly and resources are utilized effectively. ISO 9000 is part of a process that documents that control system and makes sure that the system is aligned with features desired by customers. The ISO 9000 program tells an organization what the quality assurance system should entail, but not how to do it.*

*A firm or organization can obtain an ISO 9000 certificate of conformity, which is issued by a person or organization that has been certified by the ISO 9000-member country's regulatory body. The ISO has nothing to do with the certification process, it only sets up the standards. The regulatory body in the member country decides who is competent and what procedures must be followed to audit and certify firms and organizations. The assessment that firms and organizations are following ISO 9000 standards is a matter for the suppliers and their clients, along with the regulatory body in the specific country. An independent quality certification body lends credence, however, and is often valued highly in the market place by customers.*

*The ISO 9000 program has three specific certifications. The ISO 9001 certification is the most encompassing and includes processes from design and development, to production, installation and servicing. The ISO 9002 is the appropriate standard for an organization which does no design and development. The ISO 9003 is the appropriate standard for an organization which only produces products or service, and tests them to make sure they are reliable. The ISO has recently developed standards for environmental management through its ISO 14000 program. This program concerns ways of minimizing the harmful environmental effects of organizational activities.*

In a similar manner, the firm must ally itself with the world's best downstream firms so that its outputs will be demanded as world market conditions change. A close relationship between the firm and its downstream markets will help the firm make necessary improvements in product quality and increase the competitiveness of the entire supply chain. The information flow, which ultimately begins with the consumer, is vitally important to firm success. Again, if the firm is allied with successful downstream companies, it will be much better off. It is difficult to image a firm being competitive if it associates with upstream and downstream firms that are not competitive.

### **Firm Strategy, Structure and Rivalry**

This part of the competitiveness paradigm deals with how firms are created, organized, and managed and how rivalry among firms in the home country affects competitiveness. The goals, strategies, organization, management and other firm-level characteristics vary widely among nations and these variances can lead insights into which industries become competitive in a nation. Some industries will match national cultures and tendencies, while other industries will not.

The competitiveness paradigm, as espoused by Porter, is most controversial relative to this fourth determinant of competitiveness, particularly as it relates to rivalry. Much of the rivalry among firms can be beyond simple price competition. The competitiveness paradigm suggests that fierce domestic competition and rivalry forces firms to lower costs (and prices) and upgrade product quality in order to succeed domestically. This constant pressure to improve makes these domestic firms formidable when they enter international markets.

Some opponents of the competitiveness view on rivalry would argue that domestic competition in many countries has fallen over the last decade, particularly in the U.S., due to mergers and acquisitions, and that this consolidation is leading to larger firms that have less pressure from rivals. They would argue that there are industries where the consolidations have diminished competition and allowed firms to charge higher prices and capture larger profits. This debate is left to the future literature in competitiveness and competition policy, except to say that it is difficult to determine whether mergers and acquisitions occur in order to cut costs (and therefore make the resulting firm more competitive), to lower the number of firm rivals, or allow cross-subsidization of operations among many conglomerate activities.

There is no question, though, that firm structures and strategies vary across countries and this can have an impact on firm and industry competitiveness. Chinese and Italian firms tend to be small, family-run enterprises that rely on close relationships among people (most people cannot name a major Chinese-run MNE). There is little communication about the firm outside the family and all decisions are closely held. Communications with partners and cooperating firms in the marketing system are needed more than exacting product specifications. Japanese and Korean firms, however, tend to be huge conglomerates (labeled "keiretsu" in Japan and "chaebols" in Korea) that are involved in marketing, trade, and finance for nearly every product in the economy. Companies such as Mitsubishi, Hyundai, and Sumitomo are well-known throughout the world. Their operations are on a much larger scale and the financial power of these huge firms (and their clout with the government) makes them formidable competitors.

One important cultural area that influences firms involves attitudes toward risk-taking and failure. Americans are known throughout the world for a generally positive attitude toward risk-taking. Maybe that stems from the immigrant-nature and westward movement of the early settlers. Trying and failing is acceptable in the U.S., but that is not true in other countries (e.g., Germany and Japan). There are many successful, rich American entrepreneurs who have made their fortune after numerous failures, yet that is not true in many other societies. American bankruptcy laws allow businesses to fail and the owners can start anew (if they can find someone to provide needed investment capital).

These attitudes and legal devices make it natural for American firms to enter and lead the world in industries that involve more risk. It is common for employees of successful firms to quit and start a business or for business owners (such as American farmers) to take lower returns for their activities because of their desire for independence. That yearning for independence and control leads to American leadership in many technologically-intensive areas where new ideas and products are vitally important.

American attitudes on individuality and risk also lead to the development of industries dealing with risk reduction. America is the birthplace for many financial instruments that reduce or spread risk. The U.S. leads in the banking and insurance areas because institutions have been developed to allow some of the risks faced by American businesses to be shared with others. These institutions make it easier to American businesses to enter risky ventures because there are mechanisms for them to obtain risk capital from others.

Corporate governance and culture can have an important impact on the way firms from differing countries operate. Until recently, it was believed that the short-term viewpoint of American investors kept U.S. companies from making long-term gains in market share throughout the world. This short-term view pervades companies because stockholders judge corporate managers every quarter based on earnings. Banks tend to hold a larger share of the stock in German companies, and these banks tend to have a longer-term view of corporate earnings because they do not trade shares often. The Japanese firms have an even longer-term view of the firm's profitability such that Japanese firms often trade-off short-term profits for market share.

Recent performance of U.S. companies, however, has changed some views on America's close attention to the quarterly reports on corporate earnings. The long-term view of German and Japanese companies may slow decision-making such that poor decisions are not rapidly discovered and corrected. The increasing influence of U.S. institutional investors (mutual funds) in corporate governance makes American managers more accountable for the firm's performance. This accountability, along with lucrative stock option packages, has business management gurus singing the praises of American corporate governance.

Labor-management relations also vary among firms in different countries, giving some industries advantages in some countries over others. The U.S. is known for a more combative relationship between labor and management, while the Japanese relationship is more associated with a shared vision. Both of these extremes have moved toward the middle over time as societies change. Yet, Japanese culture continues to stress the harmony and oneness of being "Japanese" whereas American culture continues to stress the benefits of "doing your own thing."

A final interesting area where countries differ greatly is in the prestige of certain jobs. Nations tend to have competitive firms in areas that are admired. The Germans and the Japanese are very adept at technical jobs that involve exactly engineering requirements. A Japanese economist once cited a study that compared factory worker performance in the U.S. versus Japan. If a manufacturing process had a minimum specification for a item, the American workers would tend to produce the product very close to the minimum specification. The Japanese worker, in contrast, would consistently produce above the minimum standard. Some people argue that this is because Japanese, in general, value technical jobs more highly and obtain more enjoyment out of such work. Porter argues that Americans and British people are much more interested in administrative or managerial positions.

The current fad in terms of corporate culture and governance is likely to change over time as the fortunes of various national firms change, but there is little doubt that there will continue to be fundamental differences in these corporations among countries. Many of these differences come from social systems, religious systems, and family relations/structures. As the world integrates, these differences may diminish, but it is unlikely that such differences will disappear over time, and they will continue to be legitimate factors in determining firm and industry success.

## **The Dynamics of Competitive Advantage and Government's Role**

The dynamism of competitive advantage is extremely important, especially these days when information systems are highly developed and technologies are very portable. Investments must continually be made in factors to keep up with other firms in the industry. Sustained investments, especially in advanced and specialized factors, will keep the firm ahead of the rest of the industry in terms of lower costs or improved products. Industries do not have to have advantages in all four of the diamonds, but having advantages in one or two diamonds normally lead to advantages in other diamonds (because of increased investments, governmental attention, and other natural adjustments in industries). Thus the dynamic relationships among the diamonds are very important.

Induced innovation and its role in overcoming factor shortages is important in a dynamic context. Prices and wages must send signals to firms and workers concerning what factor pools are needed. If factor pools can be increased (i.e., people increasing their skills for specific industries) or technology can be developed to overcome factor shortages, firms will be able to overcome short-term problems over time. Without these signals, firms will tend to rely on the government or other sources to support their industry through subsidies.

Clustering is an important concept in the competitiveness paradigm. Clustering comes about when many industries work together to create specialized conditions that promote international competitiveness. Clusters can be developed horizontally or vertically and can result in many connected relationships. Information sharing is quite important and can lead to tremendously creative innovations. Vertical clusters generate high quality, specialized products that move through a narrow marketing chain. Horizontal clusters generate highly competitive firms that share activities across the marketing spectrum. In both cases, clusters develop because firms take advantage of positive externalities generated when factor or demand conditions result in highly competitive firms. The spillovers from these highly competitive firms allow agglomeration of other competitive firms in vertical or horizontal industries – clusters help the competitiveness of the industries become more than the summed competitiveness of each industry.

The role of government in improving the competitiveness of industries within their country is solely through their influence on the four determinants. The government must follow policies that help industries take advantage of their strengths and improve those strengths over time. The government must have anti-trust regulations that force firms to compete vigorously in markets and enact regulations that encourage industries to upgrade their products and services. The government should assist in developing an environment that will encourage investments in sustainable advantages. Note, however, that most aspects of these determinants are outside the normal realm of government. This could be viewed as a source of frustration or as a source of comfort, depending on the philosophy of the government.

Government policies and regulations can help industries develop competitive advantage if those policies and regulations are anticipatory. There are examples where U.S. and European countries have enacted controversial environmental regulations despite complaints from industry. When those environmental regulations are later enacted by other countries, the U.S. or European firms that have dealt with such policies in the past have an advantage over their international competitors. Anticipatory policies in areas such as food safety, biotechnology, and other agricultural areas could give American agribusinesses an advantage over their competitors in the long-run.

Governments need to make sustained investments in areas that will generate basic factors that help the economy in general (primary and secondary education; university education; highways; general infrastructure). Yet, it is investment in advanced and specialized factors that will make a difference in many industries. The role of government in creation of these factors is unclear; should the government choose certain sectors of the economy for such investment? On what basis should the government choose sectors and what happens if the government finds that it has chosen the wrong industries for these specialized investments? It is clear that government should take more of an enabling role than a pro-active role.



## Competitiveness Analysis in Food and Agriculture

Reed and Marchant analyzed the U.S. food industry's international competitiveness relative to thirteen other manufacturing industries. They found that the food-manufacturing industry had the lowest percentage of output that was exported (5.4%) and had the second-highest ratio of foreign-affiliate sales to U.S. exports (2.33). So U.S. firms were much more likely to process food in their overseas affiliates than to export it from their U.S. plants. They found that most of the investment overseas in food manufacturing facilities was horizontal in nature (where the company is performing the same activities in the host country as they perform in the home country).

They found that the 64 largest U.S. food-manufacturing firms had sales from their foreign affiliates that were ten-times the size of their U.S. exports, indicating that large firms were much more likely to reach foreign food markets through investment rather than exports (this is consistent with the findings of Handy and Henderson). Further, there was little trade between the foreign-affiliate and the U.S. parent. They concluded that if one measures competitiveness in the Porter sense, then the U.S. food-manufacturing industry is not very competitive because its exports are very low and their out-bound foreign investment is smaller than other industries.

Bredahl and Abbott argue that the agricultural industry should be divided into four economies for an analysis of competitiveness: the production of undifferentiated primary commodities, the production of differentiated primary commodities, the conversion of primary commodities into semi-processed, and the conversion of primary and semi-processed into consumer-ready products. They argue that the U.S. has historically concentrated on the undifferentiated primary commodities<sup>[42]</sup>.

Bredahl and Abbott classify the determinants of competitiveness that are particularly important for agriculture and food. Some of the determinants are endowed, but most are generated by the firms (technology, firm strategy, and product characteristics), individuals (human capital and managerial expertise), clusters of firms (industry structure, input supply, and marketing and distribution channels), or the government (infrastructure and externalities, regulatory environment, and trade policy). They categorize the importance of competitiveness determinants among the four economies of agriculture. Natural resource endowments and cost-reducing technologies are crucial for competitiveness in undifferentiated primary commodities. They are less important for differentiated primary commodities, semi-processed products and consumer-ready products. Human capital and managerial expertise, quality-enhancing technology, and product characteristics are critical for semi-processed and consumer-ready products. Firm strategy, the regulatory environment and trade policies play an important role in all four economies, but their effects can vary widely depending on whether competition is cost-based or product-based.

One critical observation is that product differentiation and marketing chain control is becoming increasingly important in U.S. agriculture due to food safety concerns and increased consumer demand for high-quality, differentiated products. Highly specialized, identity-preserved products can be supplied easier through biotechnology and these products are being sold to consumers who are willing to pay more for this quality-assurance. These capabilities are giving U.S. food firms an advantage over their foreign competition in many cases.

Bredahl, Abbott, and Reed include a number of country case studies on competitiveness. Each of these studies takes a different approach, but it is interesting to compare their findings nonetheless. MacDonald and Lee investigate the competitiveness of the U.S. food processing industry and conclude that increases in labor productivity in the U.S. have far outstripped labor productivity advances in other countries. They take a more macro-oriented approach to competitiveness because they do not deal with individual sectors. If the analysis included raw agricultural commodities, U.S. competitiveness would certainly come from its natural resource base, the technology (cost-reducing and product-expanding) generated from the Land-Grant University System, and its infrastructure (water and land transportation systems).

Miner used many measures of competitiveness in his study of Canada's agri-food system: market share, export orientation, import penetration, labor and capital productivity, product differentiation, technological application, and growth in sales and profits. He used the same competitiveness definition as the Canadian Task Force on Competitiveness in the Agri-Food Industry: "the sustained ability to profitably gain and maintain market share." Most of his findings were in comparison to the U.S. He found that U.S. food processing firms (relative to Canadian firms) were larger in terms of value-added and employment; had higher levels of productivity; spent more on research and development; and were more involved in technology transfer. In Canada, agri-food firms were forced to pay more for agricultural raw materials and faced less domestic competition, but were more export-oriented. He believes that Canadian government policies to

protect markets and manage suppliers hurt the country's international competitiveness. Canada's most regulated agri-food industries are also Canada's least competitive.

Lattimore used a competitiveness index, which was New Zealand's export share for a commodity divided by New Zealand's share of world production, to measure international competitiveness. He concluded that New Zealand was competitive in apples, beef, mutton, cheese, and butter because the competitiveness index was above 3.0 for all those commodities (indicating that New Zealand's export market share was over three-times its world production share). He attributed New Zealand's competitiveness to its natural endowments (weather), large investments in land (improving soil quality) and technology (such as new fruit varieties), and its free trade environment (the competition it promotes). New Zealand has a number of commodity marketing boards and Lattimore was unsure whether these boards (which control international sales) increased or reduced competitiveness.

Walter-Jorgensen discussed the historical development of Denmark's agricultural sector, which exports over 66% of its production. This emphasis on exports has forced the Danish agricultural sector to use "focused differentiation." The Danes focus on products with large markets (pork, potted plants, furs), but they differentiate their products from those of other countries through technology and product characteristics. Most of the output of these products come from large marketing and processing cooperatives that are controlled by farmers, and there is little governmental support (other than export subsidies for pork that compensate producers for high internal feed prices). Denmark has also experienced lower wage cost growth and higher productivity growth than other European countries. Walter-Jorgensen estimates that Danish productivity growth in agriculture was 6-7% annually in the 1970s and 1980s, versus 4-5% annual growth in other E.C. countries.

All of these studies indicate that countries are very interested in the competitiveness of their agricultural and food processing sector. Certain elements of those sectors appear competitive, though there are many measures of competitiveness. What is clear is that economists and policy-makers are struggling with strategies that will help their firms compete in an ever-changing, increasingly global market. It is clear that sustained investments in education, infrastructure, and science are needed to maintain and enhance competitiveness, but what other government activities are needed is unclear.



## Summary

1. The competitiveness paradigm posits that nations become rich because they experience sustained increases in productivity. Their residents have highly productive jobs that pay well; their industries make profitable investments that bring handsome returns; and their regulations establish rules that help firms become more focused and productive.
2. There are two ways for firms and industries to compete -- on a low-cost basis and on a differentiated product basis. There are two measures of competitiveness for a firms and industry – the amount of exports and outbound foreign direct investment.
3. Porter believes that there are four sets of factors which determine the competitiveness of firms and industries: factor conditions; demand conditions; related and supporting industries; and firm strategy, structure, and rivalry.
4. Successful firms have means of anticipating what purchasers want in products and the firms adapt to supply those products. The rivalry among suppliers is also ruthless so that successful firms are forced to innovate often in terms of cost savings and improved product quality.
5. Clustering of similar industries is often present when a country is competitive. Information-sharing, common research and development, and other specialized infrastructure make a difference and can provide advantages to entire industries with linkages among themselves.
6. The U.S. food processing sector is less competitive than other U.S. sectors because of its small percentage of exports; U.S. food processors also have less FDI than other sectors. However, there has been substantial growth in U.S. food exports and investment in recent years.

## Questions

1. In what sense would the closing of a manufacturing plant in your local community be viewed as good news in the competitiveness framework? How is it bad news too?
2. In what ways are American food consumption habits leading demand conditions in the rest of the world?
3. Provide an example where rivalry in the U.S. market has increased agricultural exports. Provide an example where rivalry in the U.S. market has not increased agricultural exports.
4. What are some competitive advantages that a U.S. biotechnology firm might possess?
5. What can your local government do to attract competitive firms in competitive industries?

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## Chapter 14 International Marketing: Analyzing Opportunities

The term international marketing is used here to portray the firm-level efforts which result in export sales for particular companies. It is the micro-level aspects of trade that result in a flow of products and services to foreign consumers. Exporting and international marketing are used synonymously. For our purposes it is best to envision the firm as a food manufacturer that is considering selling its products in foreign countries. The firm is not simply exporting because international marketing assumes a conscious effort to understand all aspects of the foreign country to maximize the outcome from the firm's marketing effort. This might mean that the product needs to be changed, new marketing strategies developed and new personnel/talents added to the firm.

Thus far, we have discussed the macro-picture for international trade – policies, exchange rates, preferential trade agreements, the GATT, and foreign direct investment. This chapter covers some of the analyses that firms undertake to improve their likelihood of success in international markets. Certainly the firm must know about the country's market conditions, industry conditions, marketing institutions, and legal restrictions before the firm can successfully market its products.

As the previous chapter on competitiveness indicates, there must be some excellent reasons that a firm would want to overcome all the problems associated with exporting or marketing internationally. Yet exporting is an increasingly common occurrence. The globalization of the world economy has forced firms to, at a minimum, think internationally because they compete with global firms in their home market. Many firms find it profitable to export too.

There are many reasons that encourage a firm to overcome problems with exporting. Exporting allows the firm to increase volume and therefore spread its fixed costs over more units. This improves firm competitiveness and could result in lower costs for domestic and international markets. The home country market might be stagnant or declining, while international markets offer more growth potential. This is particularly true of U.S. food manufacturers who face saturated domestic markets, but vibrant international markets. Firms can extend product cycles and trademarks through international markets if the firms have leading-edge products that are not readily available in other countries. The firm's product can still be sold in international markets when new products have eroded the product's market share in the home market. The firm can also learn from its activities abroad. Through its international operations the firm can observe new products, new ways of doing business, and consumers that view the world differently. These experiences can help the firm compete in all markets.

Often the first time that the firm's product reaches an international audience is less formal, through a broker or wholesaler. Someone will approach the firm with an order which results in the product being exported. The manufacturing firm sells the product at the factory, but the product ultimately is shipped outside the country. Another possibility is that a foreign buyer will approach the company with an order from an international client. This initial dabbling with international markets by the manufacturer might lead the firm into investigating a more studied approach to international markets, which is the subject of the next two chapters.

The firm's entry into an international market should be the result of a process of analysis and decision-making so that the firm can make the most from its efforts. International marketing is similar to domestic marketing because all of the main principles still apply: the firm must supply a product that is desired by consumers at a price that is within reach of its customers; the product must be placed in the market such that consumers can easily purchase it; and the product must be promoted and advertised so that consumers know the product's attributes and value.

Yet, the challenge of international marketing is that the commercial, economic, and cultural settings differ in each country. The firm must adapt to different languages, religions, customs, rules and regulations, and risks for every country where they choose to export. The firm must reconsider the product or products that it sells, needed changes that could be made to meet new markets, who uses the product and where, and infrastructure needs associated with the product (e.g., refrigeration).

These challenges are best tackled after an in-depth assessment by the firm and a clear strategy by product and country. Yet, one must realize that international marketing is a learning experience, so initial commitments should be made with that in mind. Firms normally begin their international marketing through exporting, but this can progress to direct investment as the firm's expertise and market size increase. The analyses needed are classified as economic, political/legal, cultural, and financial, and are identical for all

entry modes. These analyses should be performed for every country that the firm considers, but the firm will normally perform an assessment or initial screening of markets to begin the process.

## Market Assessments

The market assessment begins with macroeconomic variables that indicate whether a potential market for the product exists. Such variables would include GDP per capita, population, a stable government, and a free-market system. These variables would exclude many countries from consideration due to the product's price, market size, and political considerations. A second stage might involve collection of data which would influence market size such as the number of refrigerators, microwave ovens, automobile ownership, and household floor space. A third stage would investigate the competitive environment in the foreign market and assess the costs of entry and profit potential. Finally, the firm would establish an ordered list of potential target countries which are candidates for further in-depth study.

There are many types of targeting models that firms can use to make these initial assessments. Walvoord has an elaborate process which takes firms through a general market potential filter (which includes basic economic data, social structures, and geographic features), a filter related to the general market for the product (cultural acceptability, trends in similar products, market size, and taxes), micro-level research associated with the specific product (competition, sales projections, entry costs, and profit potential), and finally corporate factors that might influence the targeted markets. Each of the steps requires more detailed information and data on the project.

### *Discussion Box 14.1 A Model of U.S. Agricultural Export Growth*

*In their aggregate analyses of U.S. agricultural exports, Salvacruz and Reed used a regression model to predict fast-growing markets. They found that the country's aggregate agricultural imports, GDP growth rate, and self-sufficiency ratio (the country's production divided by its consumption) positively influenced U.S. agricultural exports, while its distance from the U.S. negatively influenced U.S. agricultural exports. They went on to predict the fastest growing markets for the 1990s in terms of percentage growth and dollar value.*

## In-depth Analyses

After a few targeted countries are identified, more in-depth analysis is required to determine the more details on the potential market for the product. These analyses include an economic, legal and regulatory, political, cultural, risk, and financial analyses. These investigations will provide the information needed to make a final assessment of the product's potential and the background needed to establish a strategy to enter the market successfully.

### Economic Analysis

The economic analysis provides the background needed to determine that consumers will purchase the product (in its current or a modified form) at a price that will allow the firm to have a positive return. Some of the considerations in this analysis come from the initial market assessment, but the time and effort put into this analysis should be more detailed and thought-out.

The country's current standard of living and the distribution of income should be a major concern for this analysis. Low-income people concentrate their purchases on staple food items which tend to be grown locally or imported in bulk form (grains and pulses). They do not have much discretionary income to use on highly processed food items. If you are selling highly processed carrots and the country is quite poor, there may be little potential for your product. As incomes increase, people tend to upgrade their diet and consume higher quality products such as meat, dairy products, and eggs. There is more room for variety in the diet and imported products are more affordable. The income elasticity of demand for food is still high as people's income move from low to middle-income levels (up to \$10,000 per capita).

The distribution of income and the number of people in various income classes are very important because firms normally focus their marketing efforts and try to reach certain segments of the population. The overall income of a country is not as important as the number of people within certain income classes. Brazil, India, and Mexico are three countries that are considered poor, but their populations are large and their income distribution is such that there is a large middle class in each country. A firm selling processed foods which cater to a middle class person might find a large market for the product in these countries.

#### *Discussion Box 14.2 It is not just Per-capita Income ...*

*One cannot simply judge a country based on its per-capita income when assessing potential market size – population and the relative size of the middle and upper income class may be more important. Three countries, Brazil, India, and Mexico, provide good examples where there is a significant middle and upper income class which could purchase imported food products.*

*In 1998, per capita gross domestic product was \$4709 in Brazil, \$3438 in Mexico, and only \$425 in India. The average family cannot afford high-priced imported food products. However, U.S. exporters do not need to sell to every family in these countries to have a profitable entry. If 20% of the population in Brazil and Mexico are reached and 5% of the population in India is reachable by the exporter, the market sizes would be 33 million (Brazil), 19 million (Mexico), and 49 million (India). These are huge numbers and they showcase the importance of segmenting the market and determining where the firm should focus efforts.*

Ability to purchase is important, but buyer motivation must be understood if the firm is to succeed in selling products. Consumers throughout the world are flooded with products and must choose the ones that best fit their needs. A better understanding behind the motivations to purchase is crucial if a product is to succeed. Many of the motivations behind purchasing behavior are cultural in nature, and as such more difficult to quantify. Family structure (i.e., who does the shopping), religion (which products are viewed positively and which are not), and educational systems play a role in buyer motivation.

The structure of the food retailing industry is also important in relation to purchasing decisions and entry strategies. The characteristics of people who purchase food items from warehouse-style stores might be very different from the people who purchase food items from small, local specialty food stores. There are likely wide variations in the nature of those shoppers between countries too. In Hong Kong, most people (male and female) purchase foods from wet markets (small vendors in centralized markets) on their way home from work, but women in France are more likely to shop at such markets during specific shopping excursions. Higher income people will tend to purchase food from supermarkets and other large enclosed stores that carry many different food items.

The economic analysis should also investigate consumption patterns in detail (by demographic group) and the correlation in consumption among goods. Understanding food consumption habits are crucial for food

product companies and the trends in purchasing behavior are even more important. Many countries are following the Americanized trend in convenience foods, so there are natural opportunities for U.S. food processors to lead in those products if the food item is placed properly in the distribution system. However, the residents of many countries place a higher premium on fresh products than Americans, which inhibits U.S. exports of processed foods.

Transportation systems, information systems, and other infrastructure can have a pronounced influence on consumer purchases. Marketing and promotion is contingent on the types of media available to the firm (television, radio, billboards, etc.) and the phone system will determine the potential access to the internet, an increasingly important source of information and product supply. The American transportation system is based upon the premise that nearly everyone has access to a car. Therefore much of the shopping is located where retail space is less expensive and parking is readily available (the suburbs). This assumption does not hold in most foreign countries. Cars are less available and mass transportation systems are more developed. People either shop close to home or use a subway or bus to go to the grocery store. This has ramifications on the type of store frequented by the typical consumer.

Finally, there can be tax benefits to exporting products due to duty drawback provisions. A firm that exports a “similar” product can receive a refund of 99% of the import duties that it pays for raw materials. Cigarette manufacturers have an incentive to export cigarettes because they receive a refund on the import duty they paid on imported raw tobacco, saving them money. Firms can also use transfer prices for exports between their subsidiaries to reduce income in high tax countries and increase income in low tax countries.

#### *Discussion Box 14.3 Transfer Pricing*

*Assume a multinational firm has production facilities for making shirts in Haiti, Mexico and the U.S., and it is required to pay taxes in all three countries based on its income. Further assume that the firm performs initial cutting and sewing in Haiti; ships the product to its facility in Mexico for finer stitching and attaching buttons; and ships the nearly-final product to the U.S. for final refinements, packaging, and sale. The multinational firm will need to charge a price for the product as it moves from country to country. If corporate income taxes are high in the U.S. and low in Haiti and Mexico, the firm will charge a relatively high price for the shirt (likely much higher than the production costs) to its American subsidiary so that the firm is making more profit in Haiti and Mexico. This will lower its total tax bill because of the lower rates in Haiti and Mexico. These transfer prices can make a big difference in the firm’s tax liabilities and its global profit.*

### **Legal and Regulatory Analysis**

There are a host of considerations relating the laws and regulations that must be studied by a firm before it decides to launch a product in a foreign country. Each country will have its own regulations concerning product labeling, prohibited ingredients, packaging, and specification of weight. This will likely mean that the food product package will need to be redesigned because the U.S. system of weights and measures is not consistent with the rest of the world (the U.S. deals in pounds but almost everyone else deals in kilograms). Labels might need to include information in another language, though some countries allow foreign-language labels to be stuck on containers.

Foreign countries often want food products from the U.S. to be certified by the U.S. Department of Agriculture or a similar government agency. Normally, an explanation and letter from the U.S.D.A. stating that the product has met U.S. standards is enough for the foreign purchaser and the customs agent. Other times there are certification bodies or more specific standards that must be met by imports. If this is required, U.S. exporters will need to go through those certification steps to ensure that the product can be sold in the foreign country. Since 1985 the European Union has had a Third Country Meat Directive which dictates that all slaughter plants sending meat to E.U. countries must meet E.U. specifications. No foreign plant can export meat to the E.U. without certification by an E.U. meat inspector that the plant meets the exact standards of the Directive.

Food standards in Japan are set by the Ministry of Health and Welfare. They require that food product labels clearly indicate additives, preservatives, coloring material, spices or flavorings, etc. and suggest that a certificate with detailed descriptions of the ingredients (i.e., the names of chemical compounds, chemical names and international index numbers on the colors) be attached to each shipment in order to expedite import procedures. It is advised that exporters shipping a new product to Japan have it tested at a laboratory certified by the Ministry of Health and Welfare. These procedures make it more likely that a product will pass easily through Japanese customs.



Firms considering exporting products to a country should investigate general product laws and regulations concerning competitive behavior, liability (especially product liability), bankruptcy, agency relationships, patents, and trademarks. These laws and regulations vary widely by country and often legal “culture” plays a significant role in determining how rules are applied. If a product is being sold in a foreign country and a product lawsuit is filed, the case will be tried in the foreign country, so the exporting firm’s case will not be tried under its home country law. In many countries there is a tendency for the courts and regulators to side with their own people against the foreign exporter.

Sometimes U.S. laws will dictate behavior of companies in foreign markets. The Foreign Corrupt Practices Act of 1977 makes it illegal for any U.S. company to bribe a foreign government official. This law sounds rather innocuous except that bribery is a common practice in some countries (it is part of the culture) and without a bribe there is no way to enter a market or to receive a contract for a service. This effectively shuts U.S. companies out of certain markets unless they can find a way around that regulation. The Helms-Burton Act 1996 not only prohibits U.S. firms from transacting business with Cuban companies, but also makes it illegal for U.S. firms to transact business with third-countries that have operations in Cuba. The legality of this law is currently under question, but it is an example where U.S. laws can impinge upon foreign companies.

Foreign governments are often much more involved in regulating and operating commercial enterprises than the U.S. government. A U.S. food firm could find itself competing with a food processor that is owned and operated by a foreign government. This occurs less than in the past due to the recent way of privatizations throughout the world. Deregulation has also spread throughout the world, which has reduced some of the legal barriers that affect U.S. firms in foreign countries. Entry barriers have been reduced and price-fixing by the government has become less common.

### Political Analysis

Political analysis can assist the firm in deciding whether the country will provide a good market for the product in the future. Sometime the relations with the home country of the exporter will be an important consideration for the other analyses, since politics can change the economic, legal, and cultural settings. Bureaucrats can choose to administer laws and regulations differently depending on the circumstance. If those circumstances include the country of origin for a product, then politics have entered. Japanese bureaucrats have been known to further political objectives by dictating what products should be imported and which should not. Recall the debate on whether opening up the Japanese beef market would result in higher U.S. beef market shares (Chapter 3).

The Japanese would normally encourage their businesses to import more products from the U.S., but the Chinese often discourage American imports for political reasons. The U.S. is often haranguing the Chinese to improve their civil rights record or to move their economy toward a free market. The Chinese sometimes try to defuse these comments by putting commercial pressure on the U.S. The resulting loss in U.S. exports could soften the American stance on these Chinese political issues. There is no question that the general political climate is very important in providing support for a firm attempting to sell products in a foreign market. If one can get a feel for the objectives of the government and understand how to operate independent of political concerns, the better the chance for success.

Specific trade barriers might discourage importation of some products. Local content laws, subsidies for domestic producers and other non-tariff barriers can reduce the market for a U.S. exporter. Some of these measures may not be legal under the current World Trade Organization (because they are not giving imported products national treatment) and it is possible for the firm to file a complaint. However, in the meantime, the firm may effectively be shut out of the market. It is best to recognize those potential problems before commitments are made to enter a market.

### Cultural Analysis

Culture is a difficult concept to define. It includes the heritage, traditions, and habits of the people. Interlocked in culture is language, religion, family relations, and social relationships. Understanding the culture helps one envision how people will interpret and respond to external forces. If a firm is attempting to convince a potential purchaser that a product is of high quality and can fit into that person’s lifestyle, a basic understanding of how the potential purchaser views life is fundamentally important. It is also important to communicate effectively with partners (agents, distributors, retailers, and others) and an understanding of the culture will improve these communications.

Individual purchasing decisions are impacted by the values that people place on goods and services. The way that one chooses to spend time and money is intimately related to what one views as worthwhile,

which is linked strongly to religious beliefs, family relations, the educational system, and views on work and leisure. These values will influence the types of products that are purchased, but there are other factors which play a role in determining which product brand is purchased.

Reference groups, the groups with which people within a country identify, can play a strong role in determining purchasing behavior. Identifying role models that influence people can help in assessing the potential for some products. Sports drinks are often effectively promoted if the product can be associated with athletic events in the U.S. or other countries. One can also take advantage of target market's image of the exporter's home country.

Many societies place a high value on conforming to established norms, so understanding those norms is essential before entering the market. Fortunately for many U.S. companies, consumers throughout the world are changing their tastes toward Western goods, including convenience foods and Western-style restaurants (fast food and steak houses). This increases the appeal of products from the U.S.

In dealing with foreign partners, one must recognize the role of the individual in the society and the power relationships that stem from the group. These concepts have considerable ramifications in understanding corporate governance in different countries. This recognition is very important for Japan because their culture is quite different from the U.S. Individuality is not encouraged in Japan, so one should not force a Japanese partner into a quick decision. Quick decisions are based on the ideas of one or two individuals and are not characteristic of decisions within the Japanese culture. Such decision-making is a result of the highly risk-averse nature of most Japanese. The pain of a failure is much greater than the joy from a success (the exact opposite of the values in American society).

## Financial Analysis

Since the firm is ultimately interested in a successful export marketing plan, one must judge the financial aspects of international marketing. One must analyze the entry and the variable costs of placing the product in the country. Additional needed staff, payments to foreign distributors or sales agents, logistical costs, etc. must be factored into the calculations. Cash flow and rate of return analysis will be useful in establishing baselines for judging profitability. The firm must also estimate the amount of net working capital needed to allow the product to flow smoothly and include the cost of that working capital into the formulas. It is wise to include sensitivity analysis into the calculations to determine how changes in some cost categories influence profitability.

## Risk Analysis

Because so many factors are different between domestic and international marketing, there is a need to assess the risks involved and the ways to reduce those risks. There are political risks (from embargos or nationalization of operations), business risks (the competition may be too strong, partners may be unreliable, property loss may occur), and financial risks (exchange rates may change your costs or cash flow might not meet projections).

There are ways to reduce some of the risks involved in international marketing. Exchange rate risks can be reduced if the product's price is quoted in the exporter's home country currency or if the exporter hedges their sales using forward foreign exchange markets. However, both of these risk-reduction methods involve costs: quoting prices in the home country currency will force the importer to bear the risk of fluctuating exchange rates and hedging export sales will cost money. Firms can assess their potential foreign partners through many information systems and also use their bank as a source of information on a potential partner's credit worthiness.

Dealing with experienced export service providers will reduce risk too. Exporters should deal with a reputable bank which has correspondent relationships with major international banks. They can sell their product through a confirmed, irrevocable letter of credit (this allows the bank to pay the exporter as soon as the conditions of payment are met). They can deal with a freight forwarder who knows transportation systems, import regulations, cargo insurance provisions, and other logistical matters. Finally, the exporter can purchase political risk insurance through various agencies, such as the Overseas Private Insurance Corporation, a U.S. government organization.



## **Sources of Information and Programs to Assist Exporters**

The U.S. government has many sources of information that can be used in the analyses explained above. For agricultural goods, the U.S. Department of Agriculture's Foreign Agricultural Service (FAS) has a wide array of programs to assist exporters. For commercial products (including many processed foods), the U.S. Department of Commerce has many programs. Other government agencies with export information and programs are the Economic Research Service (USDA), which has a great deal of data and analysis on U.S. exports, foreign production, and other trade-related issues, and the Small Business Administration, which has some exporting financing programs. For most agricultural and processed food exporters, the FAS will be the best source of information.

The FAS has attaches stationed in almost every country of the world (the Department of Commerce has Foreign Commercial Service employees in almost every country too). The attaches are responsible for assisting exporters, supplying data, and monitoring trade policy disputes. Some of their reports are accessible through the worldwide web. The FAS has information on import requirements by country, trade leads (leads from foreign buyers seeking to purchase U.S. agricultural products), and foreign buyer lists. These sources can help the exporter determine whether markets exist for their products. The FAS has a Trade Show program that assists U.S. firms in displaying products at an international trade show. Finally, the FAS is the organization that coordinates the export enhancement program (a targeted export subsidy program for U.S. agricultural products) and the General Sales Manager export credit programs.

There are a host of private organizations that also provide useful information to exporters. The World Trade Center network has many sources of information about markets and individual foreign companies; much of it is electronically-based. The Chamber of Commerce network can be used to obtain information on business statistics and trends. Often they are an excellent source of information on specific local conditions. Commodity trade associations (such as the U.S. Meat Export Federation) can be a valuable resource for potential exporters. They have offices throughout the world for data collection, market research, and commodity promotion. There are hundreds of private companies that have market research reports that could be appropriate for a product, giving customer information, market measurements (size, potential sales), and the competitive, economic, political and legal environments.

State and local governments are devoting more time and energy into international trade and relations. They often have economic development offices that provide support for potential exporters and there are often trade offices in some foreign countries. Taking advantage of these initial contacts can provide an introduction that is very beneficial. Some economic development organizations will arrange trade missions that are focused on countries, products, or both to assist local firms in establishing contacts and commercial relations. These trade missions provide a nice way for a firm to make personal contacts and get a feel for the country's market situation. Business and local libraries will have plenty of resource materials on international markets.

Finally, there are international organizations with data readily available for exporters. The Food and Agriculture Organization of the United Nations has production, consumption, and trade data for all UN-member countries of the world. The International Monetary Fund also tracks and publishes macroeconomic data for UN-member countries.

## Summary

1. Economic analyses investigate the ability of consumers in foreign countries to purchase the product. The analysis also studies distribution systems, consumption patterns, and transportation and other infrastructure.
2. Legal and regulatory analysis investigates the country's regulations concerning product labeling, prohibited ingredients, packaging, and specification of weight. Other important considerations are general product laws and regulations concerning competitive behavior, liability, bankruptcy, agency relationships, patents, and trademarks.
3. Political analysis considers the relationship between the exporting and importing country. This relationship can be very important because bureaucrats can have great influence on how laws and regulations are administered.
4. Cultural analysis investigates the way people in the country react to external forces. A firm must understand how its potential customers view life and the world if the firm is to be successful in its marketing efforts.
5. Financial analysis estimates the cash flow, rate of return, and working capital requirements for the international marketing effort.
6. Risk analysis assesses the risks faced by the exporting firm and examines ways to reduce the risk through various strategies and government programs.
7. There are many sources of export information available to the firm. The U.S. Department of Agriculture's Foreign Agricultural Service has information and programs to assist U.S. agricultural exporters. The Economic Research Service (U.S.D.A.) has much data and analysis on international trade and production levels.

## Questions

1. The world is obviously changing rapidly because of new technologies and communication systems. Will this lead to more U.S. exports of processed foods? Why?
2. There are many foreign food manufacturers that are having great success in the U.S. by selling products from their countries. What strategies are some of them using and how could those strategies be used by U.S. exporters?
3. Mexico is a very important market for U.S. processed foods. Consider how different Mexico is culturally than the U.S. and how those differences can be overcome by U.S. exporters.
4. Assume that you are exporting popcorn to Korea. Perform an economic analysis to see whether the product has potential.



## **Web sites for more Information**

Economic Research Service [www.econ.ag.gov](http://www.econ.ag.gov)

Foreign Agricultural Service. [www.fas.usda.gov](http://www.fas.usda.gov)

Food and Agriculture Organization. [www.fao.org](http://www.fao.org)

Department of Commerce [www.doc.gov](http://www.doc.gov)

Small Business Administration [www.sba.gov](http://www.sba.gov)

International Monetary Fund [www.imf.org](http://www.imf.org)



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## **Chapter 15 International Marketing: Developing an International Strategy**

The previous chapter covered the types of analysis which must be performed before entry into an international market. This background is crucial for the firm to visualize a strategy for its particular product(s). One of the key strategic questions to be addressed by the firm is the extent that a standardized plan can be developed that will be useful for all countries and whether the plan can be a small adaptation of the domestic plan. A standard plan will be more cost-effective because the fixed resources will be stretched further, whereas widely varying plans by country will be more costly and involve more resources.

This chapter covers elements of a strategic plan that will guide the firm's international marketing efforts. The culmination of the planning process is the export marketing plan. The chapter begins with micro-level observations and decisions that the firm must make to enter an international market. The topics include distribution systems, entry strategies, pricing, logistics, and control and decision-making. The final part of the chapter summarizes the entire process by going over the components of an export marketing plan.

## Distribution Systems

One of the most important decisions that the firm must make is what segment of the market they wish to pursue. Markets are often segmented by the ultimate product user and the type of outlet where the user purchases the product. For frozen potatoes, one segment would involve individual consumers purchasing the product at supermarkets. Another segment would involve restaurants purchasing the product through a distributor. Still another segment would involve the country's army purchasing the product through a centralized government bidding process. Each of these segments calls for different marketing strategies, partnerships with foreign firms, product qualities, pricing, and volumes. The firm must decide which segments fit their firm and product. This combination of market segment and the means to get the product to the user is the *distribution channel*.

If the firm wishes to target the retail consumer, there are numerous ways to approach them: through supermarkets, warehouse stores, department stores, small grocery stores, and vendors (wet markets). Each of these outlets receive their products from different types of suppliers, and the exporting firm must align itself with one or more of those suppliers. Department stores in East Asia have huge grocery sections and often purchase their foreign products directly from manufacturers and import items directly; many warehouse stores handle their import purchases in the same manner. They also deal in large volumes and want substantial price discounts. A firm aligning itself with a distributor in the foreign country may not gain access to these large-volume customers.

Supermarkets and smaller-scale retailers will purchase their products from local distributors, some supplying specialty products while others providing large product lines. Alignment with distributors with larger product lines might give access to a wider variety of retail outlets. Institutional purchasers - such as hotels, hospitals, and restaurants - will purchase through distributors, but often those distributors tend to specialize in institutional foods. A firm might want to pick a distributor that concentrates on institutional foods if that is the segment that is targeted. Price is less of a concern in institutional markets, but volumes may not be as large either.

The Foreign Agricultural Service (FAS) attaché stationed in the target country can provide a wealth of information, contacts, and advice that will help with understanding the distribution system. These USDA employees are observing the market constantly, and they know local market researchers and many of the marketing firms. They also know many of the regulations and channels associated with particular products and can help with specific questions posed by the U.S. firm. Their reports are aimed at assisting the export operations of U.S. food processors. They are a resource that should not be overlooked in choosing the distribution channel.

All of the above discussion, though, must be taken with a grain of salt because it is not country-specific, and many times what is true about one country will not hold for another. Further, marketing relationships change over time. The firm must constantly monitor the situation and become familiar with the markets that it chooses. Often, the firm will choose one distribution strategy initially and either change or add other channels to their marketing effort. This is natural and accepted as long as the firm has not exclusively aligned itself with a particular partner in the importing country. More will be said on this in the next section.

## Entry Strategies

Once the market segment is chosen and the distribution channel visualized, the firm must choose the method to get the product to the ultimate user. This is the second important aspect of choosing the distribution channel. This section highlights some of the entry strategies that are possible, including partners and ownership relationships. As will be seen, some entry strategies are negated by the choice of market segment.

The easiest entry strategy is to indirectly export the product. An indirect exporter sells the product before it leaves the home country (the direct exporter is the firm that has title or ownership of the product as it leaves the home country). The firm can sell their product to a domestic buyer, foreign buyer, or an export management company. Indirect exporting is easy, but the processor normally has little control over the product's marketing program after it is sold. All the market placement, promotion, research, and information are lost to the processor. Thus, the processor will have little "feel" for the international market and will surrender control over all future market growth prospects to others. This is a good strategy for some firms because there is little invested in international marketing and no new resources are needed by the firm. However, the firm has no control over the future of its international marketing efforts.

A strategy that involves more work for the firm, but more potential payoff, is to directly export the product and sell it to a foreign entity, either a wholesaler, distributor, processor, or retailer. If the sale is to a wholesaler or distributor, the firm must decide upon the relationship it wants with the foreign marketing firm, particularly how much involvement the U.S. firm wants in marketing promotion and strategy. The U.S. firm has a vested interest in the foreign marketing firm's activity, so the U.S. firm might want to share in the establishment and funding of the marketing and promotion program. This is something that is negotiated with the foreign marketing firm. If the U.S. firm sells to another processor or retailer, there is usually less concern on the U.S. firm's part on the marketing program because, in the former case, the final product is not identified with the U.S. food processor and, in the latter case, the retailer will have its own marketing program.

The U.S. food processor can also choose to hire its own sales staff in the foreign country or to align itself with an agent in the foreign country. In this case, the U.S. processor keeps title of the product further into the foreign marketing system, but the costs are higher and the risk is likely greater. Nonetheless, the potential return is greater for such an arrangement in many instances because the U.S. firm controls product quality, promotion, and marketing longer and so the placement in the distribution system can be improved. One caution is that if an agency agreement is made with a particular foreign firm and the U.S. firm finds that the arrangement is not generating sufficient returns, it can be quite difficult for the U.S. firm to terminate the agreement. Further, such agreements between U.S. processors and foreign agents are often implied as exclusive agreements, even though they are not specified as such. Thus, if the relationship with the foreign agent does not work out, the U.S. firm might totally lose access to that foreign market.

More advanced entry strategies involve either an ownership interest by the U.S. processor or production in the foreign country. Some of these strategies will not involve exporting, though. The U.S. processor could form a joint venture with a foreign partner. Depending on the structure, the joint venture could involve the U.S. processor exporting to the partner and a jointly owned processing or marketing company. Another entry form might involve full ownership of the foreign facilities by the U.S. processor. The U.S. processor could supply its product as an ingredient for the foreign facility, so exports would be involved. If the U.S. processor licensed its brand or other intellectual property, there would be no exports. The processor would simply be receiving a royalty payment for the intellectual property right (though the U.S. processor would have an agreement on production processes, promotion, and other marketing considerations).

A final form of entry that is popular with larger firms is the strategic alliance. In this entry form two or more partners contribute resources to a separate entity, which can take on a corporate form. Each partner contributes unique talents and resources to the alliance, but the alliance is distinct from the individual enterprises of the partners. The alliance can be technology-based, product-based, or distribution-based. A commonly cited example is the European alliance between Nestle (Switzerland) and General Mills (U.S.) for marketing breakfast cereals. General Mills' production talents were combined with Nestle's European marketing and distribution talents for a strategic alliance. This particularly alliance, however, involves no exports from the U.S. to Europe.

The choice of a form for market entry depends on factors particular to the firm, product, and country. The competitive structure of the market and the particular market segment will play an important role, as will government rules and regulations. Some forms of entry may not be allowed (such as 100% foreign ownership of production facilities). Infrastructure in the market will also impact the entry mode because certain enabling institutions might be necessary to support the firm's strategy. It would be very unusual for a firm to choose a strategy of direct exporting with a sales staff if the firm was new to exporting and marketing structures in the country were undeveloped. Such a focused course by the firm would be very risky.

Ultimately, though, the entry form must be based on an analysis of comparative profit and risk among the alternatives. Firms must be rewarded for their efforts/risks and obtain a return on the capital required in the strategy's implementation. The firm must concern itself with issues of product control, synergy among operations, and potential growth in the future, but profits relative to risk will be the main factor guiding the entry form. The firm must also attempt to maintain flexibility in terms of future marketing options so that growth and changing situations can be easily accommodated.

## Product Pricing

The firm has many choices relative to pricing the product for international customers. These choices can be classified into four categories (similar to categories established by Henneberry): cost-plus, incremental, market, and world. The choice of which category and the specific pricing strategy within the category will be determined by competitive factors, income levels for the targeted group, tax structures in the domestic and foreign country, exchange rates, and financing costs. Competitive factors might have the largest influence on the choice, since the firm must decide whether to base their pricing on costs or on the prices of competitors. If it is based on costs, cost-plus or incremental strategies must be followed; if it is based on the price of competitors, market or world strategies must be followed.

*Full cost-plus* pricing would add all of the fixed and variable costs involved with the product (domestically and internationally), add some markup, and divide by the amount produced. Costs would vary between domestic sales and export sales, but this strategy does not allow different costs to be factored into prices. Costs involved in exporting are normally higher than domestic costs due to higher transportation costs, tariffs, distribution costs, and the like (Henneberry provides an export costing worksheet). If this strategy is upheld strictly, the domestic and foreign prices would be identical. This is not a very good strategy because exports would tend to be priced relatively low (in relation to costs) and domestic sales would be priced relatively high.

A *variable cost-plus* pricing strategy separates per unit costs between markets, and adds a mark-up to arrive at the final price. All fixed and variable costs are included, so it is likely that export prices will be higher than domestic prices. A *marginal cost-plus* strategy only takes variable costs into consideration. If there are scale economies, marginal production costs for exports will be lower, so there is a possibility that such a strategy will result in lower export prices than domestic prices.

Market price strategies result in prices dependent upon the prices of competitors and market conditions, rather than costs. A *market penetration pricing* strategy would involve the firm undercutting competitor prices in order to make sure that foreign customers try the product. Such a strategy normally results in rather low prices relative to costs. A *market share pricing* strategy is when the firm enters the market with a target market share and prices the product so that such a share results. This pricing strategy would result in a price higher than the penetration strategy. A *price skimming* strategy would take advantage of limited supplies and competition, resulting in high prices. Finally, *pre-emptive pricing* is when a firm lowers its price to combat possible new entrants into a market.

World pricing strategies deal with how prices are determined among a firm's markets. A homogeneous pricing strategy is where the firm charges the same price in all countries. A polycentric pricing strategy allows regional managers to make pricing decisions for all countries in their area. Prices are determined in the home office for a geocentric pricing strategy, but prices vary by country (allowing cross-subsidization if competition is especially fierce in some locations).

## Finding Buyers, Agents, and Distributors

After all the information about markets is collected and digested, a strategy for entering the distribution system is developed, and a pricing strategy is decided upon, the firm still needs to find someone or some company to purchase its product. All the research and analysis can only be useful if good customers are located. There are many organizations and resources that can help locate buyers.

The Foreign Agricultural Service's (USDA) attachés and the Foreign Commercial Service's (DOC) officers can help with this process. They have lists of companies within the distribution system that are looking for new products. There are numerous directories and websites that can provide lists of companies also. It is helpful to attend a trade show to meet potential partners and to get a first-hand view of the market. There are also firms and consultants that specialize in finding foreign partners for firms interested in entering a particular market.

The financial worthiness of these companies can be evaluated through private services (Dunn and Bradstreet, for instance) and banks. Yet a financial analysis will not help in gauging how motivated the partner will be in working for increased sales. This is something that the entering firm will need to judge through interviews and conversations with potential partners. The subject of exclusivity should also be discussed in a forthright manner if the partner is an agent for the entering firm. Most entering firms do not want an exclusive relationship with the partner (meaning that the distributor in the foreign country is the only entity that can sell the food processor's products), but the partner will naturally want such an association. It should be made clear in writing whether an exclusive agreement is in force; otherwise misunderstandings and legal proceedings could result.

In some less developed countries the need for countertrade and barter will exist. Countertrade occurs when a company can export to a country if it finds a buyer for products from that country. Countertrade is required when the country does not have enough hard currency (currency accepted on the world market) to use for purchasing imports. Barter is a special case where the exporting company is paid through merchandise. In such instances, the company's challenge is to find a buyer for the merchandise from the importing country. In this case entry, distribution, and pricing strategies are much less relevant because the market in the foreign country is so undeveloped that the firm will want to surrender control of the product immediately upon its arrival in the foreign country. Yet, there are excellent opportunities in some countries if the exporting firm can find another firm to buy the bartered or countertrade goods.

### *Discussion Box 15.1 Export Mechanics*

*It is interesting that the parts of exporting that the new-to-export firm fears most are the least important from a strategic perspective. Many firms fear the export process and all of the documentation requirements. This is understandable, and there is no question that the mechanics of exporting are crucial to a successful export program. However, there are many service providers that can handle those mechanics quite easily (for a fee, of course). The more important parts of a strategy are discussed in this chapter. Nonetheless, for completeness, the box will cover briefly some of the items that must be covered if a shipment is to be successful. The Department of Commerce's *A Basic Guide to Exporting* is an excellent resource for export mechanics.*

*The terms of the sale, where the transfer of ownership will take place, the price, and any quality characteristics or grading which must be present must be clearly specified. When the product is shipped there are a host of documents that must be present for smooth deliver. These include the commercial invoice, the bill of lading, the certificate of origin, and the export license. Most goods leaving the U.S. are covered by a general export license, which does not require a specific application process. An experienced freight forwarder can handle all of the transportation, insurance, and documentation requirements for exporting.*

*Exporting firms are naturally concerned about being paid for their product. There are many different ways for payment, but the most common is the letter of credit (LOC), which is issued to the seller by the buyer's bank. If the LOC is irrevocable, it will be paid even if the buyer is bankrupt (assuming that all conditions of the LOC are fulfilled). If the LOC is confirmed, the promise will be fulfilled even if the buyer's bank defaults. Of course, there is a charge for confirming the LOC, but it is normally worth the money to defray the risk. The exporting firm's bank can help out with all these details and they should either have an international department or have a correspondent relationship with a bank with one.*

## **Promotion Strategies**

Once the target countries and partners are chosen, the firm must work with the partners to develop promotion strategies to assure that the product launch is successful and that the firm's market grows over time. The promotion strategy should recognize and use information on buyer motivations to be effective. If there is a positive view of American products, that should be used in the promotional strategy. If the country has strong nationalist views, then a food processor may want to promote the health-giving aspects of the product.

The firm and partners must also decide on the promotional media. Traditional media sources include radio, television, in-store displays, and direct mailings. Each source will have different expected returns and costs that the firm will need to factor into its decision. Sometimes the food processor will be able to team with other processors for an American food week in major supermarkets and department stores with assistance from the FAS attaché. This allows the firm to not only identify with the U.S., but also draws people into the stores to try new products.



## **Global Control and Decision-Making**

By the time the firm has entered a number of foreign markets, it will have developed a system of control and decision-making that works for its product, personnel, and management culture. Communication is often a major stumbling block in large organizations and communications between the home office and foreign operations is particularly difficult. The global management system must be efficient, responsive, and adaptable if it is to serve the purposes of the firm.

There are three basic approaches that the firm can take in its control and decision making: multidomestic, regional, and global. The multidomestic approach allows most decisions to be made at the local level, with information transmitted back to the home office. Clear authority for decisions resides in the foreign country. The regional approach vests decision making with regional managers (who might be located in the home office or in a foreign location). The global approach has all decisions made by a central international sales manager with control over all operations.

Obviously, the approach taken varies by firm, yet the need for flexible decision-making and de-centralization of control varies widely depending on corporate culture and product characteristics. If products have been altered tremendously by country, there is much more logic in localized control and decision making. If products are identical among countries and the firm only exports from the home country, it is more logical to have a global strategy that links production and marketing among all foreign destinations.

## Export Marketing Plan – The Culmination of the Process

The fulfillment of the company's self-assessment, information gathering, analysis, and strategy with regard to exporting is the export marketing plan. The firm's self-assessment is the natural starting point, where it takes a hard look at its production facilities, marketing programs, financial resources, product logistics, and management/control systems. The bits and pieces from the last two chapters are summarized here to clarify the process.

The Export Marketing Plan should have the following components:

**Company and product goals.** What are the specific plans for each product and each market? What modifications are needed to the product? How do those modifications fit the specific obstacles and opportunities in the target market? This can be viewed as the summary of the plan because it is based on findings from the components below

**Company and product strengths and weaknesses.** What are the positive points of which the firm can take advantage in international markets? Why will their products (either in current or adapted form) have an edge over the competition? What are obstacles that must be overcome for success?

**Current personnel and needs.** What human resources are currently available in the firm that can help with the international effort? Are the present managerial resources capable of handling the additional responsibilities of a sustained international marketing effort? Are there synergistic personnel benefits which can accrue from exporting? What new personnel will be needed to make the international venture successful?

**Financial needs.** What financial resources will be required for the international venture? These should be classified as long-term and short-term. Can the company acquire these financial resources from existing credit sources? Can the firm take advantage of some government financial programs?

**Strategies to follow.** What strategies are necessary for the firm to launch into a new foreign market? How might those strategies change as the firm becomes more adapted to the foreign market?

**Implementation plan.** How can these strategies be incorporated into the present firm structure? How might the emphasis on entering a new foreign market affect home-country operations?

## Summary

1. Exporters target one segment of the distribution system for their initial entry into a market. The exporter can target food processors, retail consumers, institutional users, and the government.
2. Entry strategies include indirect exporting (selling to some other entity that exports the product), direct exporting to a wholesaler/distributor, direct exporting through a foreign sales staff, producing through a joint venture, producing through direct investment, and a strategic alliance.
3. There are two basic categories for pricing strategies. The first involves pricing based on costs, while the other involves pricing based on competitive factors. Examples of pricing based on costs include full cost-plus, variable cost-plus, and marginal cost-plus. Examples of competitive pricing include market penetration pricing, market share pricing, price skimming, and pre-emptive pricing.
4. There are a host of resources that can assist the firm in finding buyers or distributors for a product. The most important agency for agricultural products is the Foreign Agricultural Service of the U.S. Department of Agriculture. The U.S. Department of Commerce's Foreign Commercial Service can assist with many processed foods.
5. The export marketing plan is the fulfillment of the firm's self assessment, information gathering, analysis, and strategy with regard to exporting. The self-assessment forces the firm to analyze its production facilities, marketing programs, financial resources, product logistics, and management/control systems.

## Questions

1. Why do many U.S. exporters begin by selling products in Canada?
2. Popcorn is a food that is very popular in the U.S., but much less so in other countries. What strategy would you use if you were a popcorn exporter to increase the market size throughout the world?
3. Why might a firm producing a full-line of pickle products want to employ its own sales agent in East Asian countries? What distribution outlet might the firm target?
4. Choose a food item that interests you and find Trade Leads and Foreign Buyer Lists for the product. Do you think the product has much potential for exportation based on your findings?

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[1] *The U.S. Department of Agriculture's definition of agricultural products is used throughout this book. Most products that are derived from raw agricultural products are called agricultural.*

[2] *All data on world agricultural exports and imports comes from the Food and Agriculture Organization, United Nations.*

[3] *A tariff is a tax on a product as it leaves (export tariff) or enters (import tariff) a country. Non-tariff barriers are policies which impede trade, but are not taxes. Examples would include quotas, licensing requirements, and other restrictions on quantity.*

[4] *This number is from the Food and Agriculture Organization, United Nations. It differs from the U.S. Department of Agriculture number because of differences in definitions for agricultural products.*

[5] *These distances, A - B and A - C, overestimate the gains from trade because they do not consider consumption adjustments that occur when relative prices change. However, the distances give a concrete measure of gains from trade.*

[6] *The slash in the equation means other things held constant. In this example the supply function holds other output prices, all input prices, and other factors which affect marginal cost constant. The demand function holds other good prices, income, and other demand factors constant.*

[7] *One can think of the domestic supply curve as the effective supply curve for the exporting country. In a similar manner, the domestic demand curve is the effective demand curve for the importing country.*

[8] *The assumption of one importing and one exporting country is easily extended to any number of countries. However, the graphical analysis becomes much more cumbersome. One can simply view the export supply curve being the sum of many countries' export supply curves and the import demand curve being the sum of many countries' import demand curves. Results for individual countries would be obtained by going to the individual ES and ED curves by country. The results of various policies would be similar to the results outlined in this chapter.*

[9] *With this assumption \$I going to producers is valued the same as \$I going to consumers or to the government's treasury. Often decision-makers value one dollar for producers more than a dollar for consumers.*

[10] *Figure 4.8 could be changed such that the middle panel depicts the domestic market (ED would instead be D and MRE would instead be marginal revenue domestically) and the left panel depicts the export market. Then the exporting country would have two prices, a high domestic price ( $P_2$ ) and a lower export price ( $P_1$ ).*

[11] *For instance, it is impossible to keep all weed seeds out of grains. However, one can establish acceptable limits on weed seeds so that an outbreak is very unlikely to occur.*

[12] *This case is based on a study by Roberts and Orden and Peterson and Orden.*

[13] *Note that T will include any taxes or subsidies that are applied exclusively to the domestic product. If there are taxes that only apply to the domestic product, it is possible that T would be negative.*

[14] Note that  $P_1^*$  can include government taxes or subsidies that cause the domestic price of the input to vary from the world price.

[15] The GATT is now part of the WTO. The GATT deals with trade issues while other bodies within the WTO tackle other issues such as dispute settlement, investment, and intellectual property.

[16] The WTO website at [www.wto.org](http://www.wto.org) for the latest updates.

[17] If country A continues to import from country C, it will receive some tariff revenue.

[18] In this analysis, one can assume that country C represents the rest of the world. The fact that its export supply function is perfectly elastic represents the assumption that country A and country B are small countries.

[19] The twenty-seven members of the European Union are Austria, Belgium, Britain, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, and Sweden. Britain, Ireland, and Denmark joined in 1973; Greece joined in 1981; Spain and Portugal joined in 1986; Austria, Finland and Sweden joined in 1995; Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia in 2004; Bulgaria and Romania in 2007; and Croatia in 2013.

[20] At this writing the EU and the euro are struggling with the debt problems of many members, including Greece, Ireland, Italy, and Spain. It is not clear whether the currency and the economic union will survive.

[21] Britain, Denmark, Greece, and Sweden did not join the EMU. Greece did not meet the convergence criteria, while the other countries chose not to participate.

[22] For instance, Germany, Britain, France, and Italy each have 29 votes out of the 345 total; whereas Malta only has three votes.

[23] The dollars would really come from the European Central Bank, but this will be called the French central bank for simplicity.

[24] The World Development Report, 1992, is the major source for this conclusion.

[25] One will find individuals who adhere to the polar views, but in general most people would classify themselves between the definition of a free trader and an environmentalist. Esty argues that there are two types of environmentalists: ones who think that economic growth is bad and others who think that trade might not naturally lead to an improved environment. The latter group wants to make sure that some of the gains from trade are used to ensure that growth is sustainable and to preserve public health and ecological resources.

[26] Yet it is impossible to find canned tuna in the United States that is not labelled “dolphin safe.” Labels obviously worked for tuna.

[27] As noted earlier, poorly defined property rights are often the cause of environmental problems. Chichilnisky argues that these poorly defined property rights often lead to more intensive pollution in less developed countries (LDCs).

[28] This policy might be enacted because it is much easier to collect an export tax than a pollution tax. Note, however, that export taxes are unconstitutional in the U.S.

[29] The data on fertilizer use is for all crops, so it does not account for differing fertilizer intensities by crop. Unfortunately, fertilizer application data are not available by crop.

[30] Unless otherwise stated, all statistics quoted are from the European Commission’s Statistical and Economic Report for Agriculture in the European Union, 2012.

[31] One hectare is equivalent to 2.469 acres.

[32] All tons are metric tons, which are approximately 2205 pounds. The term cwt stands for 100 pounds.

[33] Feed rations commonly include sugar beet pulp, manioc, corn gluten, and citrus pulp with soybean meal used for protein. Tracy states that a typical ration includes 30 units of cereals, 25 units of soybean meal, 17 units of byproducts, and 6 units of manioc.

[34] The taste for these traditional products was developed years ago as Europeans would travel for vacations. Consuming these products (it is argued) often allowed people to remember the unique scenery,

*pleasant smells, and other aspects of their visit to the region. So (they argue) it is impossible for American sparkling wine to remind the consumer of their experiences in the Champagne region of France.*

*[35] There were a few free markets around during my first trip to China in 1988. Crime was almost non-existent because if you had money you were likely to be a criminal. Even party officials had little money, but they did have cars and other perks. It is very different today in China.*

*[36] A government official told me in the mid-1990s that 150 million people could leave rural areas in China without affecting agricultural output. Thus, they needed policies that could put those unproductive rural residents to work.*

*[37] American firms often lead in these non-patent advantages for many industries. Those advantages are why American negotiators to the WTO are very interested in liberalizing trade in services (especially banking and insurance), where these non-patent advantages are vitally important for firm success.*

*[38] Mexico was a classic case of this phenomenon, where U.S. investment in particular was highly discouraged through legal requirements and regulatory hassles. More details are provided on these changes for Mexico in Chapter 7.*

*[39] There is a \$25 million threshold for affiliates, so small affiliates are not included in these numbers.*

*[40] See Ethier for discussion of these and other issues in the general theory of international trade.*

*[41] Much of the conceptual material presented in the first sections of this chapter comes from Porter.*

*[42] The percentage of U.S. exports in bulk form has fallen fairly consistently over the years except during 2002-2008 when it increased. In the early 1970s over 70% of agricultural products were in bulk form (Economic Research Service). In 2001 only 35% of exports were in bulk form. After the peak of the recent uptick was reached in 2008 (at 45%), the percentage has fallen to 34% in 2013. All of these percentages are still much higher than the bulk export percentages from the European Union.*