

Lecture 17: The Economics of International Trade

In the past 30 years, the percentage of American GDP generated by international trade has doubled, and gives indication of growing in the future. International trade and financial relations play a far bigger role in our economy than at any time in the past. It is important that we turn our attention to international relations, as the next two lectures will do. Here, we will discuss:

- The economics of international trade
- Trade data and the balance of payments
- Exchange rate determination

The Growth in Trade

The growth in international trade is due to many factors, but particularly:

- Transportation and communication costs have fallen, making it profitable to ship many items around the world.
- A series of trade agreements has resulted in significantly lower tariffs (taxes on imports) and other barriers to trade. These include
 - The European Economic Community
 - NAFTA
 - ASEAN
 - The World Trade Organization

The case for International Trade is essentially the same as the case for domestic trade. We can all gain by specialization, and the principle can easily be extended to the international arena. After all, do I personally care whether my car comes from Detroit, Atlanta, or Japan?

A Little History

When Adam Smith wrote *The Wealth of Nations* the prevailing school of thought in economics was Mercantilism, which argued that a nation maximized its wealth by maximizing exports. Reduced to its basics, Mercantilists argued that, to the extent possible, a nation should be self sufficient in all it consumed. Mercantilists measured wealth in terms of gold and silver. (Today we talk about large foreign exchange reserves, but the idea is the same.) Ideally, you should sell all of your exports for gold or silver and not buy anything at all.

We see versions of Mercantilism today. Every report that the nation is running a balance of payments deficit leads to questions such as "how are we going to pay all of this back" and "how many jobs are going overseas?"

Smith argued for the opposite idea: in an ideal world, it would be far better to be able to purchase everything you wanted without having to produce anything at all. To Smith, the true measure of a nation's wealth is its standard of living, what it consumed. Exports are the unavoidable price paid for imports. To Smith, the purpose of trade was to gain the advantages of specialization and thus increase a nation's standard of living.

David Ricardo, an early 19th century British economist, popularized Smith's ideas. In Ricardo's day, many Britons argued against free trade on Mercantilist principles, arguing that countries better at producing goods would rob England of her wealth. They believed high import tariffs were the only way to keep the nation's wealth of the country from flowing abroad. Part of the debate focused on the British Corn Laws. (Our "wheat" is British "corn") Ricardo introduced the notion of *Comparative Advantage* as opposed to *Absolute Advantage*.

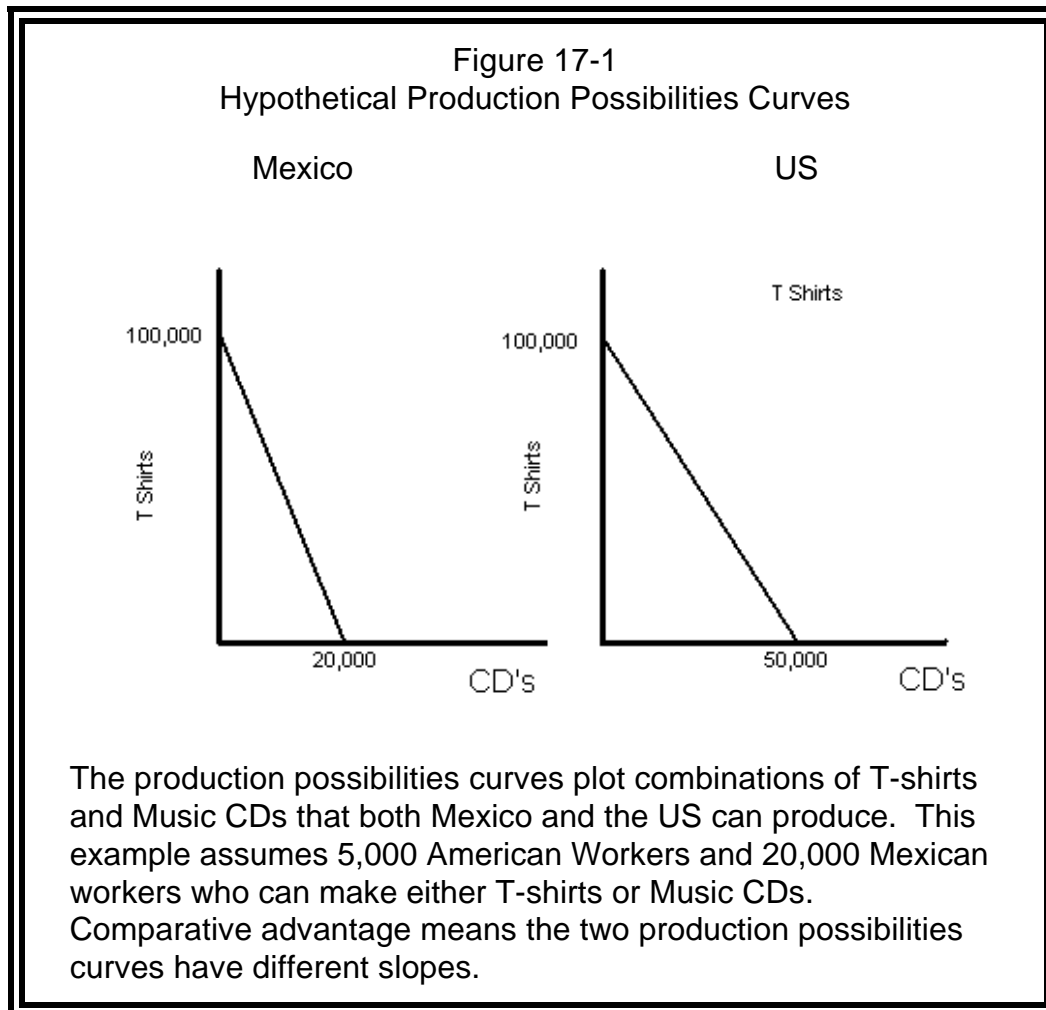
An example will illustrate the concept. If Fred can produce four pizzas per hour while Barney can produce only one, Fred has an *Absolute Advantage*. If Fred can produce nine hamburgers in an hour, while Barney can produce four, then Fred also has an absolute advantage in hamburgers. However, Barney is comparatively better than Fred in the production of hamburgers compared to pizza. Barney has a *Comparative Advantage* in the production of hamburgers, while Fred has a comparative advantage in the production of pizzas.

Comparative and Absolute Advantage Illustrated

Table 17-1 gives hypothetical data on output of Music CDs and T-shirts in the United States and Mexico.

	T-shirts	Music CDs	Relative Cost
United States	20	10	2:1
Mexico	5	1	5:1

Figure 17-1 illustrates the two production possibilities curves for the US and Mexico. This graph assumes 5,000 American workers and 20,000 Mexican workers who can make either T-shirts or Music CDs.



Warning from the Economist General:

- Production Possibility Curves are usually not straight lines as shown here, but instead are curved. The lines are drawn here as straight lines to make the example easier to explain.

Some Facts from this table

American workers are more productive than Mexican workers and will have higher wage rates. The United States has an absolute advantage in both T-shirts and Music CDs. American workers can produce more T-shirts

per day and more Music CDs than Mexican workers can. However, the workers of *each* nation have a comparative advantage. In the Music CD industry, Americans are ten times as productive as Mexicans are. In the T-shirt industry, American workers are only four times as productive. Thus the United States has a comparative advantage in the Music CD industry, while Mexico has a comparative advantage in the production of T-shirts.

Given that each nation has a comparative advantage, both Americans and Mexicans will gain from trading. We can say this despite

- The American Worker's fear of competing with "cheap foreign labor".
- The Mexican Worker's fear of competing against more productive workers.

These points surprise many people. Ross Perot's major argument against NAFTA was that American jobs would be lost to Mexico because we could not compete against low wages. Perot's argument ignored the fact that trade is a two-way street. No doubt, someone in Mexico was making a similar argument about the difficulties of competing against the American giant. As we shall see, the argument does not hold water.

The Relative Prices of T-shirts and Music CDs

Absent International Trade

- In the US, a Music CD costs two T-shirts, for that is the opportunity cost of producing a Music CD.
- In Mexico, a Music CD costs five T-shirts, for that is the opportunity cost of producing the Music CD.

With International Trade

- The price of a Music CD, in terms of a T-shirt, the terms of trade, must be the same in both countries. The price must be between 2 and 5 T-shirts per Music CD. To know the exact price, we must know the actual demand functions for Music CDs and T-shirts in both countries.
- We will *assume* (so that we can get on with this example) that the actual price is 3:1.

The Gains from Trade

To see how both countries will be made better off, suppose 10 American Workers Stopped Producing T-shirts and started producing Music CDs. Then

- US T-shirt production declines by 200 T-shirts per day
- US Music CD production rises by 100 Music CDs per day.
- The US can trade the Music CDs for 300 Mexican T-shirts so that there is a net gain of 100 T-shirts in the US.

The Mexicans can also gain. If 60 Mexican Workers stopped producing Music CDs and started producing T-shirts, then

- Mexican Music CD production declines by 60 Music CDs per day.
- Mexican T-shirt production rises by 300 T-shirts per day.
- Mexicans can trade the T-shirt for Music CDs so that there is a net gain of 40 Music CDs to Mexico.

We could continue to repeat this experiment with more US and Mexican workers, with the same results. The natural result of this process is that the US will be manufacturing Music CDs and trading some portion of that production to Mexico for T-shirts. Mexico will produce T-shirts and trade to get Music CDs from the US.

Factors Determining Comparative Advantage

Many things work to determine a nation's comparative advantage. Here is a partial list:

Specialization. Adam Smith stressed the advantage of specialization. Suppose I had an identical twin brother, who was my exact clone. If I specialize in producing one product while he specializes in producing another product, then, Smith argued, we will produce more between us if than if we each produce both products separately. Thus, we see some small nations with no specialized features that become very skillful in producing one product, building a comparative advantage in one product.

Climate: Wheat grows best in Kansas; Bananas grow best in Central America.

Natural Resources: South Africa has a comparative advantage in gold production; Texas has a comparative advantage in oil.

Deliberate Investment Decisions: The US has significant research facilities that give it an advantage in producing new technology. Our defense spending during the cold war gives us a significant comparative advantage in industries involving electronic systems, as well as in the aircraft industry.

Dynamic Comparative Advantage: Comparative Advantage can change. Businesses and Nations can compete to change comparative

advantage by investing in physical and human capital and technology over time.

Economies of Scale: Economies of scale arise when it is cheaper to have a single producer of a product. Then the country with economies of scale will have a comparative advantage. For example, one plant in Japan produces almost all of the glue for computer chips in the world. If the plant only produced for Japan, the cost of the glue would be much higher.

Capital Intensity. A country's relative capital intensity can give it a comparative advantage. For example, the United States has an abundance of capital relative to Indonesia. Pharmaceuticals are relatively capital intensive, while textiles are not. Thus, the United States should have a comparative advantage in pharmaceuticals, while Indonesia should have a comparative advantage in textiles.

Arguments against Free Trade

While free trade is good for the nation as a whole, there are winners and losers within a nation. Thus, free trade attracts opposition. We want to spend some time exploring the winners and losers. We will begin with a discussion of what seems like a piece of esoteric economic reasoning, the Heckscher-Ohlin theorem, and then move to adjustment costs.

The Heckscher-Ohlin Theorem

The Heckscher-Ohlin Theorem goes a long way towards explaining much of the controversy surrounding free trade. It stresses the difference between Capital Abundant and Labor Abundant Nations. Before we get into the details, a few simple definitions will help.

- **Capital Abundant Nation:** A higher level of capital per worker in one country relative to another, a high capital labor ratio. For example, the United States is capital abundant relative to Indonesia.
- **Labor Abundant Nation:** A lower level of capital per worker in one country relative to another, a low capital labor ratio. By the same token, Indonesia is labor abundant relative to the United States.
- **Capital Intensive Production:** Production that uses a relatively high level of capital per worker. Electricity, for example, is generally produced by capital intensive methods.

- **Labor Intensive Production:** Production that uses a relatively low level of capital per worker. Handcrafts, for example, are usually produced using little capital.

The Heckscher-Ohlin Theorem states that capital abundant countries will have a comparative advantage in commodities requiring capital intensity. Thus, capital poor countries will specialize in hand made crafts, while capital abundant countries will make cars, heavy machinery, and the like.

For example, the US has an abundance of capital. Music CDs are relatively capital intensive, so the US should have a comparative advantage in this field. Mexico has a relative abundance of labor, so Mexico should have a comparative advantage in labor-intensive T-shirt making.

Factor Price Equalization

An important implication of the Heckscher-Ohlin model is that trade equalizes factor prices across different countries. It tends to increase the demand for factors of production in relative abundance and decrease the demand for factors of production relatively scarce in a country. Thus as we increase trade between (say) the US and Mexico, we will see the effects illustrated in Table 17-2.

Table 17-2		
Impact of Free Trade between Capital Abundant and Labor Abundant Nations		
	Wage Rates	Return on Capital
US	Move Lower	Moves Higher
Mexico	Moves Higher	Moves Lower

As trade increases, the demand for capital-intensive goods increases in a capital-intensive country, and the price of capital will rise. As the demand for capital rises, the demand for labor will decrease, causing the price of labor to fall. The process happens in reverse in labor-intensive countries.

Human Capital

There is an important qualification. Many workers, particularly highly skilled workers, have significant human capital. In many cases, the effects on wage rates and capital returns can offset each other. Table 17-3 shows how these effects will work themselves out. The wage rate will

decrease in the high wage country, and the wage rate will increase in the low wage country, and eventually equalize. So too should the return on capital, and the consequence may be that high income workers in the US (those with high human capital) are made better off, while low income workers in this country are made worse off. Thus, we can predict who will support and who will oppose free trade.

An example may help. Fred does low-skilled assembly work in the United States. Free trade means he must compete with similar assembly workers throughout the world, and that drives his wage rate down. At the same time, Barney is a television scriptwriter. Free trade means that TV shows sell throughout the world, increasing the demand for his services and hence his wage. Fred's counterpart in an underdeveloped country finds his wage going up because he begins producing exports to the United States. Barney's counterpart in the domestic television industry is in danger of losing her job (who is going to watch a locally produced television show when you can get X-files?)

Table 17-3			
<i>The effect of free trade on skilled and unskilled workers</i>			
	<i>Wage Rate Component of Compensation</i>	<i>Human Capital Component of Compensation</i>	<i>Combined Effect on Compensation</i>
US			
Unskilled Worker	Declines	NA (Not applicable)	Made Worse Off
Skilled Worker	Declines	Increases	For highly skilled workers, free trade is a boon
Mexico			
Unskilled Worker	Increases	NA	Made Better Off
Skilled Worker	Increases	Decreases	For highly skilled workers, competition with the US may make them worse off.

In the US, wages for highly skilled workers have been increasing relative to the wage of low skilled workers, because high skilled workers *can*

now compete globally while low skilled workers *must* compete globally. (The choice of words in Italics is deliberate).

Free Trade versus Fair Trade

Some people advocate "Fair Trade" as an alternative to "Free Trade". The recent demonstrations in Seattle, Washington at the convening of the World Trade Organization were intended to make this point. While the demonstrations attracted a whole host of causes (including one notable banner to "abolish interest rates") several people advocated in a more serious manner that attention had to be paid to fair trade. The point is worth discussing.

Advocates of Fair Trade make several points, in different ways. However the arguments generally fall under two general headings.

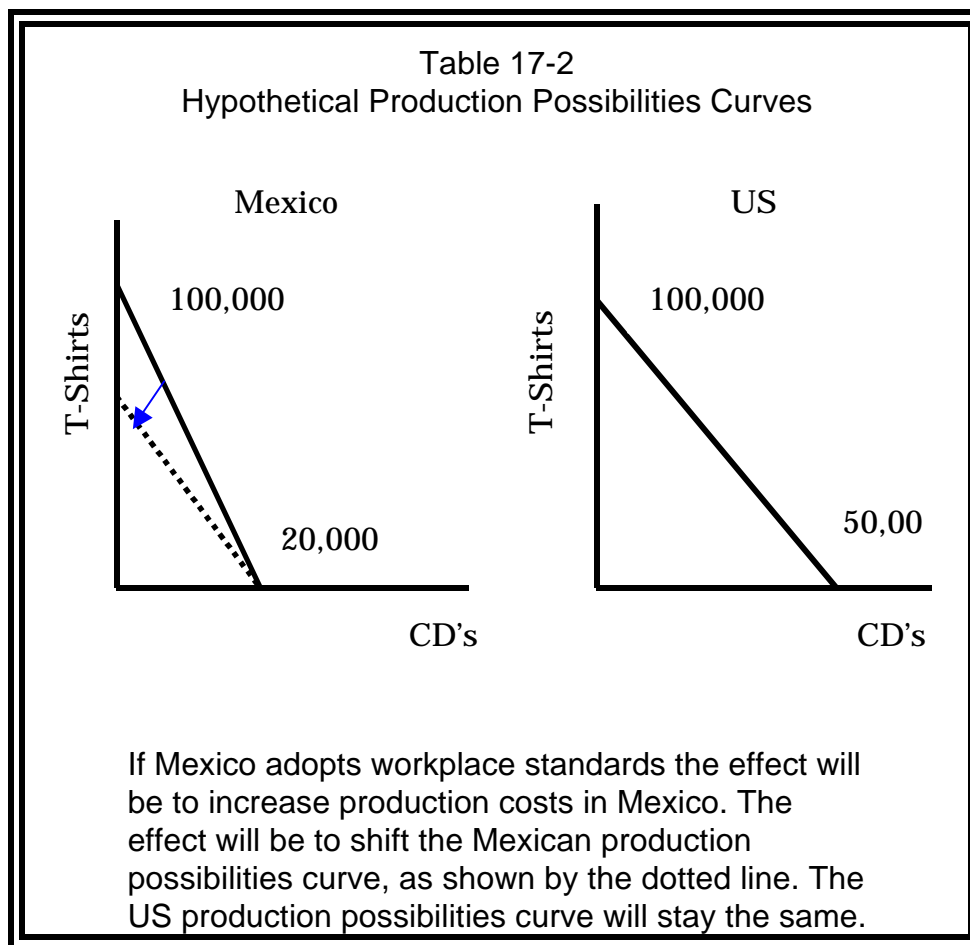
- Many people working abroad work under conditions not found in the United States. These practices include unsafe work places, incredibly low wages, long hours and the use of child labor. Two arguments are made here. First, American workers cannot compete against people working under such conditions, and, second, it is "intolerable" that people should work under these conditions. The argument is that we should refuse, on moral grounds to trade with nations unless they adopt "fair" labor practices.
- The second argument is that many nations adopt environmental policies well below the standards imposed in the United States. Thus foreign nations have an economic advantage because they do not have to give due attention to the environment and second, because we are encouraging practices that permit environmental degradation.

Thus the argument goes that we should restrict trade to nations that engage in "Fair Trade", including standards on hours and wages, child labor, and environmental conditions. Let us consider three issues:

- The Effect of adopting Fair Trade on Underdeveloped Countries
- The Effect of adopting Fair Trade on Mexicans
- The Motives behind the Fair Trade Movement

The Effect of adopting Fair Trade on Underdeveloped Countries

To see how fair trade works, return to our basic diagrams for the production possibilities curve for Mexico and the United States, reproduced below:



Direct Effects

If we require that Mexico adopt standards for wage rates, work place conditions, and environmental regulations, the effect will be to increase production costs in Mexico. To illustrate how this might happen, suppose that these regulations effect Mexican production of T-shirts, the industry in which Mexico has a comparative advantage. Suppose further, for concreteness, we require that Mexico reduce the length of the workday, so that a Mexican worker can only produce 4 T-shirts in a day. The effect will be to shift the Mexican production possibilities curve, as drawn in the following figure:

The result will be to change the terms of trade between Mexico and the United States. Recall before the adoption of Fair Trade, we assumed the trade ratio would be three t-shirts for each CD. Now, given the Mexican labor practices, the new ratio will be lower, say 2.5 T-shirts for each CD. That means that Mexico will have to 2.5 T-shirts for each CD it purchases. You might think this a good deal for Mexico, for it formerly had to give up 3 to get

a CD. But it used to take 0.6 days to make enough T-shirts to purchase a CD, and now it will take 0.625 days to make enough to purchase a CD.

In short, Mexico will be poorer.

Might there be some gains for the (reduced) number of Mexicans who manage to find employment making T-shirts for export? Of course, but those gains will be more than offset by the losses to most Mexicans. And, since fewer CD's will be imported, the persons who continue to work in the CD industry will gain as well, but as we saw in the basic argument for free trade, the gains to a few from stopping free trade are more than offset by the losses to many.

Impeding Economic Growth and Democracy

There is another impact on Mexico and other underdeveloped countries. When we discussed the basics of economic growth, we described the kinds of factors that led to economic innovation and economic growth. Trade Liberalization was an important component of the Index of Economic Freedom. Nations with free trade tend to have high levels of income. Several factors account for this relationship. Basically, if a nation becomes part of the world economy, are forced to eliminate corruption, burdensome government controls, and excessive red tape; they are also forced by the pressures of the world economy to protect property rights and adopt efficient systems of taxation.

As a practical matter, if Mexico or other underdeveloped nations cannot trade with the United States, they will not have the external pressures of the world economy to reform their economic structures. Thus there will be a secondary effect on the nation: it will not grow and develop. Without de-emphasizing the advantage of trade to reap comparative advantage, there is a second dynamic advantage: if we want nations like Mexico to prosper, we must bring them into the world economy. Imposing wage and workplace standards on Mexico more appropriate to Japan, the European Union, and the United States is a barrier to economic freedom and hence to economic development.

The problem gets worse. There are a number of studies showing a relation between democracy and economic growth. The two go hand in hand: The higher the level of per capita income in a nation, the more likely it is to be a democracy. To be sure there is something of a chicken and egg quality to this relation between per capita incomes: which comes first. While the research in this area is still on-going and still controversial, there seems to be an emerging consensus that economic growth promotes democracy. In short, there seems to be a causal relationship along the following lines:

- Fair Trade practices restrict Free Trade.
- Reduced Free Trade leads to a lower Index of Economic Freedom
- A lower Index of Economic Freedom leads to a lower level of per capita GDP.
- A lower level of per capita GDP leads to a lower level of democracy.

This is heady stuff, to be sure, but this would not be the first time that a policy designed with one thing in mind (helping poor nations) ends up with the opposite effect.

It is not surprising that underdeveloped nations are by and large aghast at the notion of Fair Trade. It is to many of them, the ultimate American conspiracy.

The Effect of adopting Fair Trade on Americans

These effects are quite obvious. If we alter the exchange rate from 3 T-shirts per CD to 2.5 T-shirts per CD, American consumers will suffer. A T-shirt will cost more.

Again, some workers will benefit. Free Trade imposes adjustment costs on workers currently employed in the T-shirt industry. If Fair Trade blocks the introduction of Free Trade, those workers will not suffer those adjustment costs.

As already noted, however, the net gains to consumers are more than the net loss to persons in the T-shirt industry.

The Motives behind the Fair Trade Movement

It is usually considered impolite to question the motives of anyone in such a debate. But economists, even if they worry about using the right fork at a dinner party, are less inclined to worry about being impolite when it comes to public policy debates. Beginning with Adam Smith, there has always been a suspicion amongst economists that people claiming to act in the public interest are actually acting in their own self-interest.

One example will suffice. In the 1920's the textile industry was centered in the Northeast. It began to relocate to the Southern States, in search of cheap labor. While the typical worker in the South was less productive than his Yankee counterpart, the differences in wage rates more than made up for the loss in productivity. (This argument may sound familiar in the context of the current debate about jobs leaving the United States). Adjustment costs were thus imposed on workers in the Northeast, and political leaders were concerned.

Manufacturers had a Constitutional Right to relocate anywhere they chose in this country. Thus it would have been futile to prohibit relocation, or prohibit importation of "cheap", almost "foreign", textiles from the South. Another approach was followed. Under prodding from congressmen from New England, Congress adopted the Fair Labor Standards Act, imposing Minimum Wages. While done in the name of improving the lot of poor southern workers, many economic historians believe the underlying objective was to protect textile jobs in the Northeast. After all, the reasons for relocating to the South would disappear if you had to combine Southern productivity with New England wages.

Not surprisingly much of the support for Fair Trade comes today from Labor Unions and industries that bear the adjustment costs associated with Free Trade. In graduate school economists are taught "If it looks like a duck, walks like a duck and quacks like a duck, it is a duck". Thus there is an inclination to attribute the drive for Fair Trade not for some concern for underdeveloped nations, but to the self-interest of the advocates.

We need to be fair. Some people honestly believe that it is important to restrict trade unless work place standards for people in other countries to protect them from being "exploited by big business". While respecting their motives and intents, the reality is that efforts for Fair Trade are hurting the people in these countries. These improvements raise the cost of doing business, so firms hire fewer people resulting in fewer people having jobs and income. What appears to be helping these people is really hurting them. In addition, if you look deeper you will find that many individuals promoting fair trade are in reality doing it to increase jobs in the US for themselves or those that they represent.

Reasons Free Trade is Restricted

Adjustment Costs

We talk about shifting workers from the T-shirt industry to the Music CD industry, but it takes time. Factories specialized in T-shirt production may well become worthless because of the shift. Hence, there is often an emphasis on slow introduction of free trade.

These adjustment costs also affect workers. Creating freer trade will cause a dislocation of workers in an industry in a country that does not have a comparative advantage relative to another country in that industry. The workers from these firms face job loss as production of their product shifts to another country. (In our example, both American T-shirt workers and Mexican Music CD workers face dismissal.) These workers can be retrained

for a different industry, but this takes time and is difficult for older workers near retirement.

To soften the blow countries have tended to phase out trade barriers. The changeover to free trade is made slowly over time, so that workers from the declining industry can retrain or retire over time, and so that firms will not go bankrupt at the initiation of free trade. For example, NAFTA has a phase-out period. In some cases, tariffs will be cut 25% after one year, 50% after 5 years, and 100% after 10 years. This phase-out will allow production to shift from one industry to another more slowly than without this phase-out.

Phasing in free trade has a cost. It will take years to gain all of the benefits of free trade. This period of transition may be necessary politically, but it does have an important disadvantage.

National Security

Some people argue that trade restrictions are necessary to protect national defense. While this argument may be important for a limited number of industries, it has little bearing on most real-life trade restrictions. In the early 1970's the domestic oil industry argued for restrictions on imported oil on national security grounds. If we are worried about running out of oil in case of war, it would seem to make more sense to use Arabian oil and keep American oil in the ground.

Infant Industry

Another argument for trade restrictions is that infant industries with high start-up costs need temporary protection from foreign competition to become well established. This is very much like a new restaurant saying it needs a government handout to get going. If the restaurant has good prospects, investors expect to lose money during a start up period. They figure that the present value of future profits more than justified some costs for getting started. The same argument applies to new domestic industries trying to get started. If expected future industry profits are high enough to justify the losses for a few years, then investors would be willing to accept short-term losses in return for future profits. The industry would not need temporary protection from foreign competition. Trade restrictions essentially force people to invest in these industries (through higher prices) when they are unwilling to invest voluntarily.

Old mature industries usually invoke this argument, arguing they need time to restructure. In most cases, they want permission to continue business as usual.

Retaliation

Some people argue that trade restrictions can help provide advantage in bargaining with other countries to reduce their restrictions. Such a strategic trade policy may invite further foreign retaliation and start a trade war, in which every country loses.

Summary

The gains from free trade are sufficient to compensate everyone. It is possible that free trade can make everyone better off, but it is not clear that free trade will make everyone better off unless there is compensation.

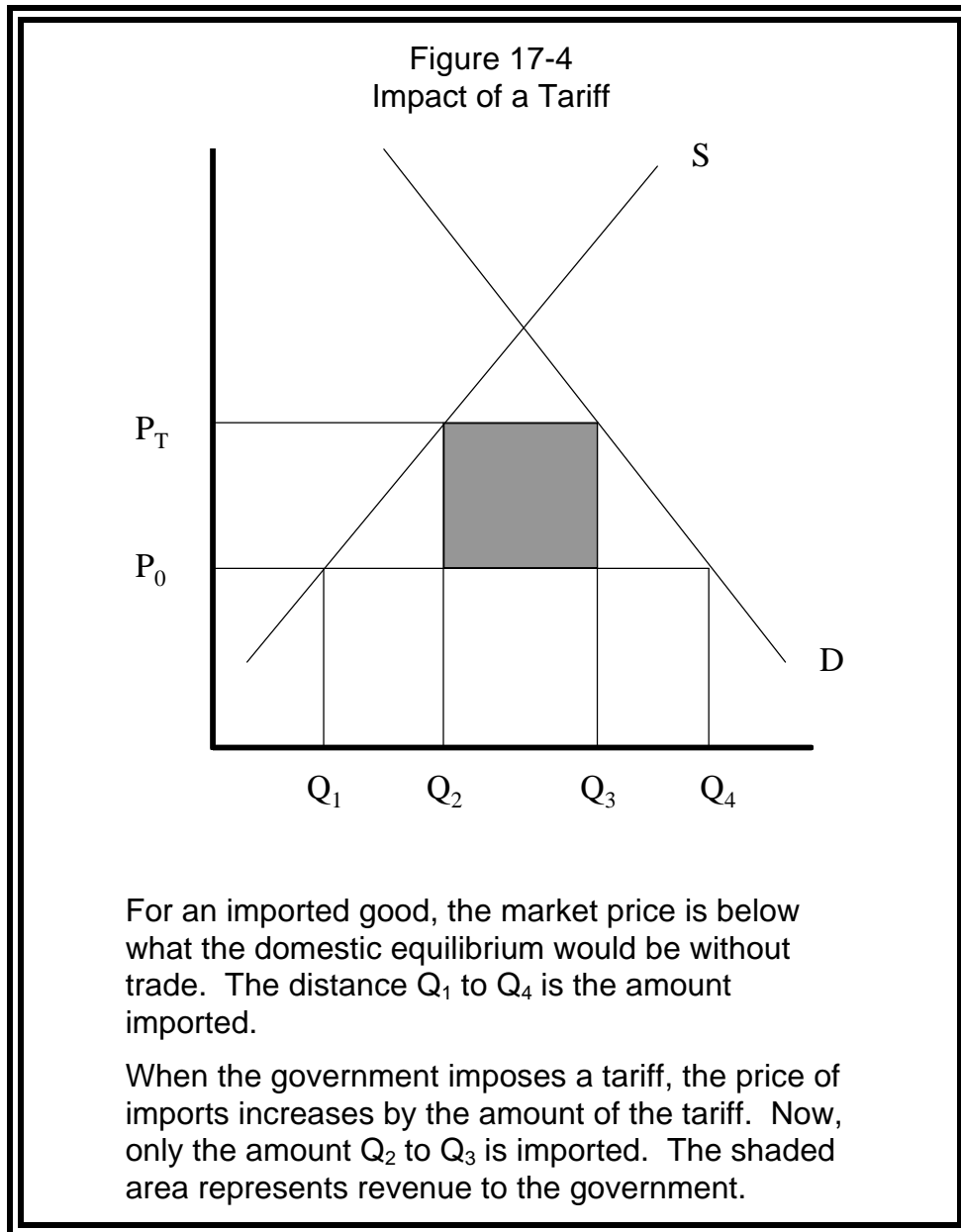
The arguments against free trade are subject to abuse by special interests that want high tariffs for their own interests. Most real-life restrictions on international trade result from the political powers of interest groups that benefit from those restrictions. The benefits of trade restrictions are usually concentrated in a small group of winners (who have an incentive to lobby for those restrictions). The (larger) costs of restricting trade fall on many consumers, each of whom has inadequate individual incentive to oppose the restrictions.

How Free Trade is Restricted

Despite the advantages to free trade, governments still adopt a number of policies that restrict free trade.

Tariffs

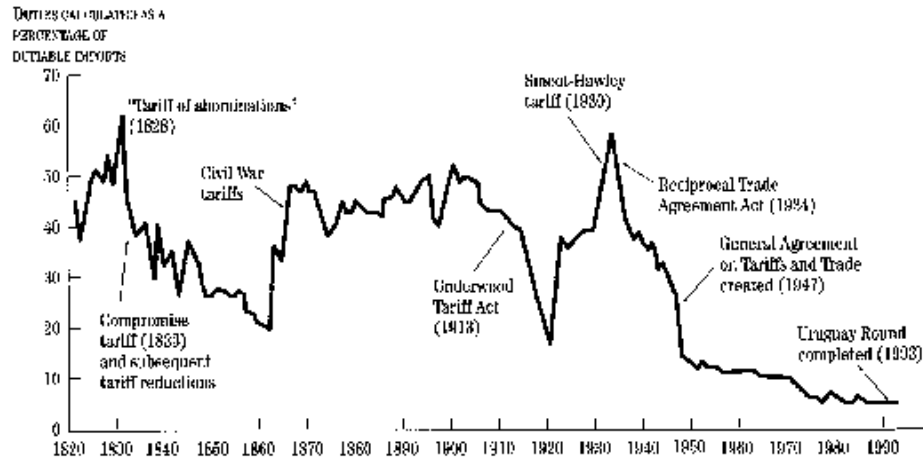
The idea of a Tariff is quite simple: the government taxes imports, raising import prices, lowering the quantity imported and raising revenue for the government. Figure 17-4 shows the impact of a tariff. The shaded area represents revenue to the US government.



A Brief History of Tariffs

Figure 17-5 shows the history of tariffs in the United States. At one time tariffs was the major source of revenue for the federal government. As you can see, tariffs have been falling dramatically since World War II.

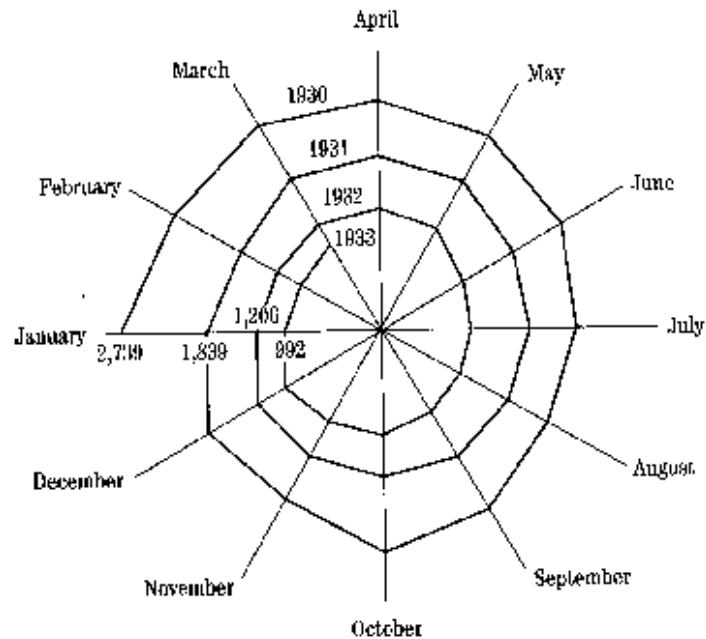
Figure 17-5
US Tariffs over Time



This is a simple graph of tariffs over time. There are numerous periods of high and low tariffs, but, ever since World War II, tariffs have been on the decline.

There are a number of periods of dramatic increases in tariffs. For example, Congress enacted the *Smoot-Hawley* tariff during the Great Depression, when some claimed that US domestic producers needed restrictive tariffs to save jobs. The idea, sometimes referred to as “beggar thy neighbor”, was that we should export our unemployment. The disadvantage is obvious: two can play at that game. The Smoot-Hawley tariff triggered retaliation by other countries playing “beggar the United States”. While the tariff protected jobs in some industries, it eliminated jobs in other industries as countries retaliated, bringing worldwide trade to a standstill during the depression. Figure 17-6 shows the impact of the trade war on international trade.

Figure 17-6
The Contracting Spiral of Free Trade



This is what happens when you engage in a trade war. Trade declines and all lose.

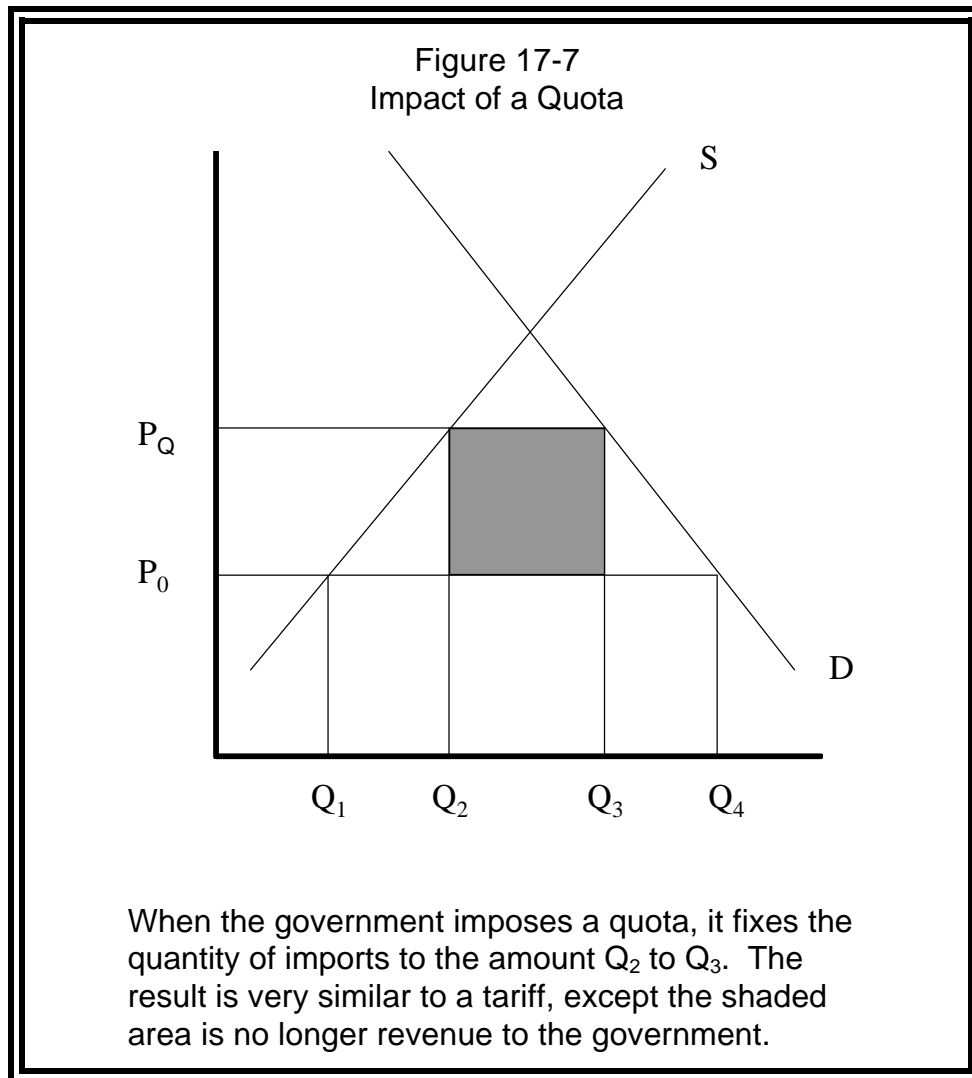
Non-Tariff Barriers

Tariffs seem to be on their way out. The World Trade Organization and various free trade areas have gone a long way in helping to reduce tariffs worldwide. Increasingly the barriers to international trade come through non-tariff means, and we might discuss some of them.

Quotas

Quotas limit imports. Just as with tariffs, they raise the price to the consumer and lower the quantity imported. However, as Figure 17-7 illustrates, the revenue goes to the quota holder, and not the US government. The domestic price is the same as with a tariff, but now foreign firms are prepared to pay an amount equal to the shaded area for the quota rights. The revenue goes to the foreign officials who have the authority to allocate

the quotas, sometimes to them in their official capacity and sometimes to their Swiss Bank Account.



Voluntary" Restraint Agreements

They are voluntary in the sense that the US government tells foreign producers: you volunteer to do this or else. The effect is similar to a quota. They raise the price to the consumer and lower the quantity imported. Here the revenue - extra profits - go to the foreign producers, and not the US government.

Non Restraint Restraints

Import regulations restrict imports. At one time France allowed VCRs to enter France through only one small obscure port.

Regulatory rules

The government sets regulations ostensibly to provide for quality products. In fact, the regulations restrict the market to domestic products. The US, for example, sets such strict regulations on air conditioning units, that some foreign manufacturers decide not to enter the US market at all. Several years ago, Europeans designed restrictions on the electrical cords for McDonald's fryers, ostensibly to promote fire safety. They had the effect of restricting the market to domestic producers. The Japanese are notorious for this practice.

“Buy American”

This is yet another example of restrictions on trade.

Intellectual Property Protection

International trade also includes intangible goods, sometimes called intellectual capital. When Microsoft exports a disk containing a copy of Windows 98, the real export is the skill in writing the software. The value of the disk per se is largely irrelevant. These exports cannot take place without patent and copyright protection abroad. Firms such as Microsoft, Coca-Cola and Disney require adequate patent and trademark protection abroad.

Ways to achieve free trade

There are a number of strategies for creating free trade. We will discuss three: unilateral action, customs unions, and multilateral negotiations.

Unilateral Action

A nation always has the option of simply removing all tariffs and trade restrictions. The British did this in the mid-19th century. As a political matter, no country is really prepared to do this today, holding out the promise of trade liberalization as a carrot to induce other countries to do the same.

Economists divide on the following question: if a nation could find the political means to go unilaterally to free trade, would it benefit? The answer appears to be that it would.

Customs Unions

The European Union is the most famous customs union. Several years ago, Benelux (Belgium, the Netherlands, and Luxembourg), Germany, France and Italy decided to adopt common customs and slowly over time integrate their economic policies. Other countries have joined the EU over time. Goods move freely from one nation to another. There are common external tariffs. People can move freely from one country to another, and the bureaucrats of the European Union issue numerous regulations designed to make sure that there is a common economic policy. Thus, they effectively legislate against non-tariff trade barriers within the European Union.

There are other examples of customs unions in the past. The United States of America is a clear example as is the *Tollverein* (Customs Union) started by Prince Bismarck in Germany when Germany was divided into several independent principalities.

Multilateral Negotiations

There are at least two versions of multilateral negotiations worth mentioning.

- Multilateral negotiations: such as the Uruguay Round of the WTO negotiations, designed to reduce tariffs and barriers to international trade around the world.
- Regional Trading Areas such as NAFTA, which allows free movement of products between the US, Canada, and Mexico of products produced within their borders. However, this is not free trade, but only free trade within the block.

All of these require complicated negotiations. If we were to negotiate liberalized trade with the European Union, we might propose "we will cut the tariff on French Wine if you will cut tariffs restricting exports from Ohio". These negotiations would cover thousands of products and trade policies. The difficulty is that when the treaty comes to the United States Senate for ratification, the Senate might say "we like the reductions in tariffs for Ohio Products, but the rates on French wines are too low". Thus, our government has usually negotiated under "fast-track" legislation, authorizing the President to negotiate trade treaties and then submit them for congressional approval or disapproval. The Ohio Congressman complaining that the new trade pact will hurt Ohio Wines must consider a package deal involving Wines and Manufactures.

As a side point, the current budgetary process requires any bill to be revenue-neutral. Thus if we agree to reduce tariffs on French wines and thus cost ourselves (say) \$100 million in tariffs, the administration must propose \$100 million in new taxes or spending cuts as part of the tariff treaty.

Issues for Negotiations

This simple example talks about exchanging a reduction in our tariff on French Wines in exchange for a reduction in the European Community tariff on Ohio Manufactures. However, tariffs are now quite low, and most negotiations focus on non-tariff issues. Some examples illustrate the point.

- Many countries have a requirement limiting the showing of American TV shows. We seem to have a comparative advantage in the production of TV shows. Thus, American negotiators might propose limiting these restrictions. Foreigners will scream about attacks on their culture and the importance of preserving cultural diversity.
- Mexican truck drivers cannot deliver goods made in Mexico to the United States. The goods are reloaded at the border. This is a barrier to Mexican imports. The Teamsters Union objects because it will reduce jobs for Teamsters, and talks about the lack of safety of Mexican trucks.
- The Chinese are notorious for pirating American recordings. We insist that China enact and enforce copyright laws.
- For domestic political reasons, the European Community and the Japanese have all sorts of protections for their farmers. American farms are quite productive and we insist that they eliminate the same types of agricultural supports we have just eliminated.

This is, to be sure, only a partial list. However, it gets the basic ideas across.

Exchange Rates Revisited

Previously, in lecture six we discussed two methods to explain exchange rates: Purchasing Power Parity and Interest Rate Equalization. To refresh your memory we will repeat the basics of each of these theories.

Purchasing Power Parity

Purchasing Power Parity states that \$1 should buy the same amount of goods and services in the US as does a dollar's worth of a foreign currency

in that foreign country. A dollar's worth of Yen in Tokyo should buy the same goods in Japan as a dollar would in the US. If PPP does not hold then *arbitrage opportunities* would exist. That is, you could buy goods in one country and sell them for a higher price in the second country.

- PPP clearly works in hyperinflation, that is, periods of rapid inflation (at least 100 percent per year). During hyperinflation, the domestic currency exchange rate generally changes in step with changes in the inflation rate.
- However, PPP doesn't work that well when confronted with minor inflation rates such as those usually found in industrialized countries.
- The theory does not do a good job for non-traded goods.
- Even predictions for traded goods have a problem. Almost any real "good" is a combination of traded and non-traded goods. Since the theory does not explain movements in non-traded goods, it really doesn't do a good job for any real good.

Interest Rate Equalization

Interest Rate Equalization explains that differences in interest rates predict exchange rate changes.

An example will clarify the issue. Suppose

- Investors know that the exchange rate between the United States and Japan is $\$1 = ¥105$ this year, and that
- The nominal interest rate is currently 5% in Japan and 10% in the United States.

Therefore, the exchange rate *must be* $\$1 = ¥100$ in one year. To see why, consider an investor planning to invest \$1,000,000. If she invests it in dollars, she will have \$1,100,000 a year hence. If she converts her dollars into yen at an exchange rate of $\$1 = ¥105$, she will have ¥105,000,000. If she then invests the yen, she will have ¥110,000,000 in one year. For the two returns to be equal the exchange rate must be $\$1 = ¥100$ in one year. (Actually, she will have ¥110,250,000 a year from now, but to keep the example simple, we have rounded the numbers). Table 17-4 shows this.

If the exchange rate is not $\$1 = ¥100$ in one year, arbitrage opportunities will abound. Borrowing in dollars and investing in yen, or vice versa can make money. In short, arbitrage opportunities force the expected exchange rate changes to equal the difference in interest rates.

Table 17-4 Interest Rate Equalization (Repeated from 7-8)		
<i>Interest Rate Today US</i>	<i>Interest Rate Today Japan</i>	<i>Difference</i>
10%	5%	5%
Exchange Rate Today		
\$1 = ¥105		
Exchange Rate in One Year Must be:		
\$1 = ¥100 (Yen appreciates)		
Have \$1,000,000 To Invest Today		
Invest in \$ @ 10%	Invest in ¥, Exchange at \$1 = ¥105 @ 5%	
\$1,000,000	¥105,000,000	
After One Year		
\$1,100,000	¥110,250,000	
In Yen, = 100 * \$1,100,000 = ¥110,000,000	In Dollars = ¥110,250,000/100 = \$1,102,500	
Note: the two amounts are approximately equal. They would be exactly equal if we had not done some rounding off		

Summary

Purchasing power parity does not do a good job of predicting exchange rates, except in the case of hyperinflation. Interest rate equalization is a good way of predicting changes in exchange rates; but it does not explain what causes the changes.

What Does Determine Exchange Rates?

Thus, we turn to the question of what actually determines exchange rates. Since we have now discussed international trade we are now able to answer this question.

Again, we turn to the laws of supply and demand and our example of T-shirts and Music CDs. From the Mexican standpoint, to get Music CDs, they must give up some of their currency (the Peso) to get dollars to buy Music CDs. Likewise, to get T-shirts, the US must be willing to supply dollars in exchange for Peso. In other words, Mexico will be demanding dollars, while the US is supplying dollars to a foreign exchange market. For simplicity, suppose that the trading of T-shirts and Music CDs are the only sources of supply and demand for dollars, respectively. In this case, equilibrium requires that dollar receipts from Music CD sales equal dollar expenditures on T-shirt. We could also talk about the demand and supply of Peso and achieve the same result.

When we worked the example involving T-shirt and Music CDs, we assumed that T-shirts would trade for Music CDs at the rate of 3:1. In other words, the relative price of the two goods (p_c/p_T) = 3. Suppose that T-shirts cost 25 Pesos, while a Music CD cost \$7.50 For (p_c/p_T) = 3, the exchange rate must be 10 Pesos = \$1. At this exchange rate, the demand and supply of funds are in balance. This is shown in table 17-8.

Terms of Trade	T-shirts Mexico	Music CDs US
3 Mexican T Shirts for 1 US Music CD	3 T-Shirts @ 25 Pesos each	1 Music CD @ \$7.50
Cost in Terms of Domestic Currency	75 Pesos	\$7.50
Exchange Rate	75 / 7.5 = 10 Pesos = \$1	

However, the basic demand for trade may change, altering our exchange rate. For example, suppose demand skyrockets for Music CDs so that one Music CD trades for 4 T-shirts, or (p_c/p_T) = 4. For the supply and demand for funds to be in balance, the exchange rate would have to adjust to

13.33 Pesos = \$1. We would say that the dollar had appreciated or that the Peso had depreciated. Table 17-9 shows this result.

Terms of Trade	T-shirts Mexico	Music CDs US
4 Mexican T Shirts for 1 US Music CD	4 T-Shirts @ 25 Pesos each	1 Music CD @ \$7.50
Cost in Terms of Domestic Currency	100 Pesos	\$7.50
Exchange Rate	100 / 7.75 = 13.33 Peso = \$1	

In addition to changes in the demand for trade, the exchange rate will be affected by the domestic monetary policy of each country. Two examples illustrate the process.

First Example

As before, suppose a T-shirt costs 25 Pesos. A Music CD costs \$7.5, and $(p_c/p_T) = 3$. We know the exchange rate will be 10 Pesos = \$1. Suppose now that the Mexican monetary authorities increase their money supply by 50%. The Quantity Theory of Money implies that Mexican prices will rise by 50%, so that T-shirts will cost 37.5 Pesos. In turn, that means a new exchange rate of 15 Pesos = \$1. Table 17-10 shows the calculations.

Terms of Trade	T-shirts Mexico	Music CDs US
3 Mexican T Shirts for 1 US Music CD	3 T-Shirts @ 37.5 Pesos each	1 Music CD @ \$7.50
Cost in Terms of Domestic Currency	112.5 Pesos	\$7.50
Exchange Rate	112.5 / 7.5 = 10 Pesos = \$1	

Of course, we know that a 50% increase in the price level can influence wealth and hence the demand for Music CDs, so things will not work out as neatly as this example suggests.

Second Example

Suppose domestic monetary policies in the US mean that Music CDs cost \$7.50. Suppose also that domestic monetary policy in Mexico means that T-shirts cost 37.5 Pesos. Suppose further that we know T-shirts cost 4 times the cost of a Music CD. Then $150 \text{ Pesos} = \$7.5$, so that the price of Pesos must be $20 \text{ Pesos} = \$1$. Table 17-10 shows the calculations.

Terms of Trade	T-Shirts Mexico	Music CDs US
4 Mexican T Shirts for 1 US Music CD	4 T-Shirts @ 37.5 Pesos each	1 Music CD @ \$7.50
Cost in Terms of Domestic Currency	150 Pesos	\$7.50
Exchange Rate	$150 / 7.5 = 20 \text{ Pesos} = \\1	

There is more to the story. As the exchange rate changes, incomes will change. In our example, the skyrocketing demand for Music CDs will be good news for Americans, specializing in the production of Music CDs, and bad news for Mexicans. The income effects will affect the demand for both products.

In fact, the situation is more complicated than this simple example suggests. There are multiple goods going back and forth between Mexico and the United States, not to mention the rest of the world. Thus, the demand and supply pattern is more complicated.

Relation to the Text

Each lecture ends with a section relating it to the text. In some cases, material is omitted, either because the text covers it well enough or because it is not worth learning. In other cases, material is added. Each of these “lectures” will end with a brief note relating the lecture to the text, describing what material is left to the student to learn alone and what material may safely be skipped.

Which Chapters does this lecture cover?

Section from Stockman	Coverage
Ch. 16, Scope of International Trade	Covered
Ch. 16, Comparative Advantage and the Gains from Trade	Covered
Ch. 16, Balance of Trade and the Current Account	Covered in Lecture 15
Ch. 16, Protectionism	Covered
Ch. 16, Common Arguments for Protectionism	Covered

What material is new?

The Heckscher Ohlin Theorem, the determinants of the Exchange Rate, and Free Trade Versus Fair Trade.

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