We talked in an earlier lecture about how taxes can reduce gains from trade. Now we’re going to look at the same set of questions in the context of international trade. Suppose we have a country like France, and France has been able to increase economic value by importing a product, pomelos, in which it lacks comparative advantage. Let’s suppose now the pomelo growers of France get together and decide that they want to have their market protected and lobby the government to impose a tariff on the import of pomelos from abroad. What would happen to the market for pomelos if this tariff were imposed, and what would happen to the total amount of economic value if this tariff were, in fact, enacted?

Let’s look at this problem in a diagram. Recall that with international trade we have our domestic demand curve and our domestic supply curve. Instead of going up to the point of intersection, however, we focus on the world price. We look at the quantity that’s demanded domestically, the quantity that’s supplied domestically and the difference between the two of them is the quantity of imports. Now the total amount of economic value created with economic trade is the consumer surplus, which is this large triangle between the demand curve and the world price, and the producer surplus, which is this little triangle between the world price and the supply curve.

Suppose now that in addition to paying the world price everyone in France who buys a pomelo has to also pay a tariff, an import tariff. The import tariff maybe legally levied on the grocery stores that import pomelos but they’re going to pass the price along. They’re going to pass the cost of the tariff along to their customers. So what happens when the price of pomelos in France rises by the amount of this tariff or this extra tax? The tariff is like an excise tax imposed upon each unit of an imported good. So when the pomelos are imported, the price rises by the amount of the tariff. And the price that people in grocery stores in France will have to pay will be the world price plus T, where T is the amount of the tariff, per unit, maybe 10 cents per pomelo.

What happens when the price of pomelos goes up by the amount of the tariff? Well, if we take the line, the dotted line on across our diagram, you’ll see that the tariff changes the behavior in this market. Well, that always makes the economists suspicious. We were very happy with what people were doing before, because it was creating a lot of economic value. Now, when you’ve got a tariff and people change their behavior, we suspect that things can only get worse. Well, let’s see what happens.

The first thing that happens with the higher price is that the quantity of pomelos demanded domestically shrinks. That is, people in France now want fewer pomelos because they are willing and able to buy fewer at this higher price. They buy some kind of substitute instead or they simply do without. The second thing that happens as a result of the tariff and its higher price is that more French farmers get back into the pomelo business. More French farmers decide that they can afford to supply pomelos, they can afford to be sellers because they can cover their opportunity cost at this higher price. So buyers buy fewer pomelos, farmers sell more pomelos.

The quantity of imported pomelos shrinks when this large volume of trade at the world price to a small volume of trade when the tariff is imposed. What happens to the economic value in this market? What are the consequences of this tariff on consumer surplus, producer surplus, and total economic value? Well, let’s look. Remember that consumer surplus before was the entire area above the world price and below the demand price. Can you identify total consumer surplus after the tariff is imposed?

Total consumer surplus is now the area above the new price, distorted upwards by the tariff, that is, people have to pay a higher price, and below the demand curve. Total consumer surplus is now this smaller triangle. The total amount of consumer surplus has shrunk by the area of this trapezoid. This trapezoid, notice, has four parts. Part one, part two, part three, and part four. All four parts use to be part of consumer surplus, but no more. With the higher price consumer surplus has shrunk and knocked off this entire trapezoid.

The next consequence is that at the higher price domestic farmers are getting more producer surplus. That is, at this higher price producer surplus is going to be bigger than it was before. Can you identify the area of the new producer surplus? The new producer surplus is the area below the tariff distorted price and above the supply curve. All of this area now is profit for producers of pomelos in France. The additional producer surplus, that is, the part that’s added over the free trade case is this area right here that we called area one.
So observe that of the lost consumer surplus, part of it is captured by the producers. Part of the lost consumer surplus goes to domestic farmers who are now making pomelos. In addition, this area that we called area three, is the revenue that the government raises from the tariffs. This area consists of a height, and the height is the amount of the tariff, which was added on to the world price. So here’s the tariff, 10 cents per pomelo, multiplied by the number of pomelos that are imported. So if you take the total volume of imports, multiply them by the amount of the tariff, we get amount times volume of imports equals tariff revenue.

So area three is captured by the government; a lot like the tax revenue was captured in the excise tax case. So of the four areas that have been lost to consumers, one area was restored by being transferred to producers and another area was restored by being transferred to the government. That leaves these two areas, area two and area four. This is the deadweight loss from the tariff. These areas are the lost economic value that is not regained by any one.

Let’s look at each of these areas in turn. We’ll look first at area four. Area four represents a reduction in domestic consumption. These are pomelos that should have a low price to import and had a greater benefit for customers, but these customers are no longer buying pomelos, because the price has been pushed upwards by the tariff. The reduction in consumption associated with the tariff creates a deadweight loss. Consumers who should be buying pomelos, if they could get them at the true price, but are not buying them at the high price created by the tariff. This area is a deadweight loss. It’s lost value from a reduction in consumption.

Let’s look now at area two. Area two represents lost opportunities to the economy. Look at these French farmers that are producing pomelos. The true cost of growing pomelos is high and getting higher. This is land that’s been taken away from the production of other products, such as wine or apples or some other good that can be grown in France and has more value. The opportunity cost of making pomelos is getting high. Instead France should be importing its pomelos, down here at a low world price. It would be cheaper for the people of France to be getting their pomelos from abroad, but because domestic producers are making those pomelos instead, people in France are doing without other goods that the same resources could produce, such as wine or apples.

This area, which is deadweight loss, represents the loss from inefficient domestic production. That is, the land is being used to make pomelos and it should be used to make something else, something more valuable. Instead, the pomelos should be imported at the low world price. So, to summarize. When a tariff is imposed the volume of imports shrinks. The cost to the economy is a loss of consumer surplus, as consumers have to pay higher prices to get products that they previously imported at lower prices. Some of that lost consumer surplus is merely a transfer. That is, some of it winds up in the hands of domestic producers and some of it winds up in the hands of the government as tariff revenue. But part of the loss from the tariff is never recovered, and that is the deadweight loss. The deadweight loss comes from consumers that are pushed out of the market permanently and from inefficient domestic production, which uses land to produce pomelos that would have a higher value in other uses. The only reason pomelos are being grown is because of the tariff and the extra subsidy that that provides to producers.

If you look carefully you can see that this tariff really has two effects. It’s like a tax on consumers and a subsidy to producers. That’s one of the reasons why economists are suspicious of tariffs. We usually like to pursue policy goals one at a time. Anytime you’ve got a policy that does two things at once, we’re going to be suspicious that it’s not doing either one of them as well as it can. Stay tuned and we’ll slice open the pomelo.