"THE INVISIBLE HAND"

"Every individual is continually exerting himself to find out the most advantageous employment for whatever capital he can command. It is his own advantage, indeed, not that of society, which he has in view. But the study of his own advantage naturally, or rather necessarily leads him to prefer that employment which is most advantageous to society..... He generally, indeed, neither intends to promote the public interest, nor knows how much he is promoting it.....and by directing that industry in such a manner as its produce may be of the greatest value, he intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part his intention." (Adam Smith, *Wealth of Nations*, 1776: p.454-6).

Contents

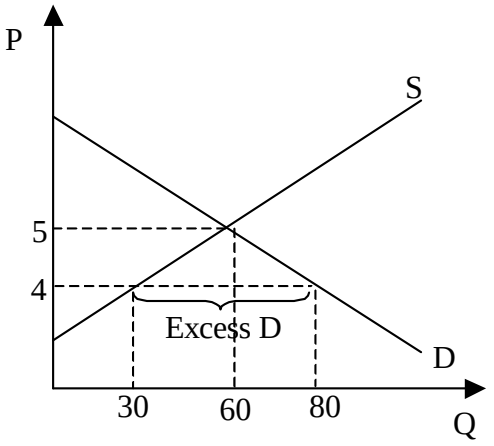
Thus every Part was full of Vice,
Yet the whole Mass a Paradice;
...
The Root of Evil, Avarice,
That damn'd ill-natur'd baneful Vice,
Was Slave to Prodigality,
That noble Sin; whilst Luxury
Employ'd a Million of the Poor,
And odious Pride a Million more:
Envy itself, and Vanity,
Were Ministers of Industry;
Their darling Folly, Fickleness,
In Diet, Furniture and Dress,
That strange ridic'lous Vice, was made
The very Wheel that turn'd the Trade.
....
Thus Vice nursed Ingenuity,
Which join'd with Time; and Industry
Had carry'd Life's Conveniencies,
It's real Pleasures, Comforts, Ease,
To such a Height, the very Poor
Lived better than the Rich before;

Bernard de Mandeville, *The Fable of the Bees*, 1713

IMPORTS & EXPORTS

Armed with demand and supply, let's get back to our foreign trade story. In our story, we have computers & stereos. We haven't been expressing prices in money amounts (dollars or yen per computer), but rather in opportunity cost terms as "number of stereos" per computer. So, let market price (P) denote "stereos per computer".

So, if we were to draw a demand-and-supply depiction of the Japanese market for computers, we would have something like:



Now, remember that the domestic price for Japanese computers (opp. cost) was 5 stereos per computer. Let us assume that was the market-clearing price in the absence of trade. So, at the price of 5 stereos per computer, Japanese consumers will buy 60 computers and Japanese firms will produce 60 computers. Everything is fine. The computer market has cleared.

Now if the price of computers went down to 4 stereos p/c in Japan, then Japanese firms would produce only 30 computers, while Japanese consumers would be willing to buy 80. Obviously, there is a situation here of **excess demand** or **shortage** of computers in Japan. The size of the shortfall is 60 - 30 = 50 computers which people want but Japanese firms are not willing to produce.

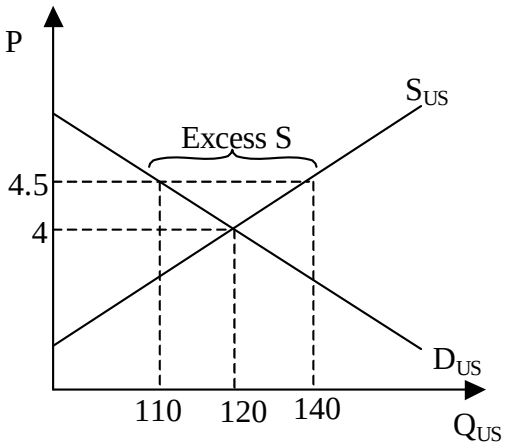
Under normal circumstances, such a situation of excess demand would push the price of computers back up to the market-clearing price of 5 (the Law of Markets again).

But instead, suppose trade with the US suddenly becomes possible. Remember that the domestic price of American computers was 4 stereos per computer. Suppose American computer firms made them available to Japanese consumers at that price. Then, instead of waiting for the Law of Markets to raise prices, the Japanese consumers could just *import the shortfall* from America. In other words, they'll buy 30 computers from Japanese producers

and the remaining 50 from American producers. With the shortage "fixed" by American imports, there is no longer any pressure for the price of computers in Japan to go up.

But are we sure American producers have an extra 50 computers to export to Japan? That depends on American demand & supply for computers.

So, to analyze the Japanese situation properly, we also have to pay attention simultaneously to the American computer market. This is done in the picture below. D_{US} and S_{US} are American demand and supply curves for computers.

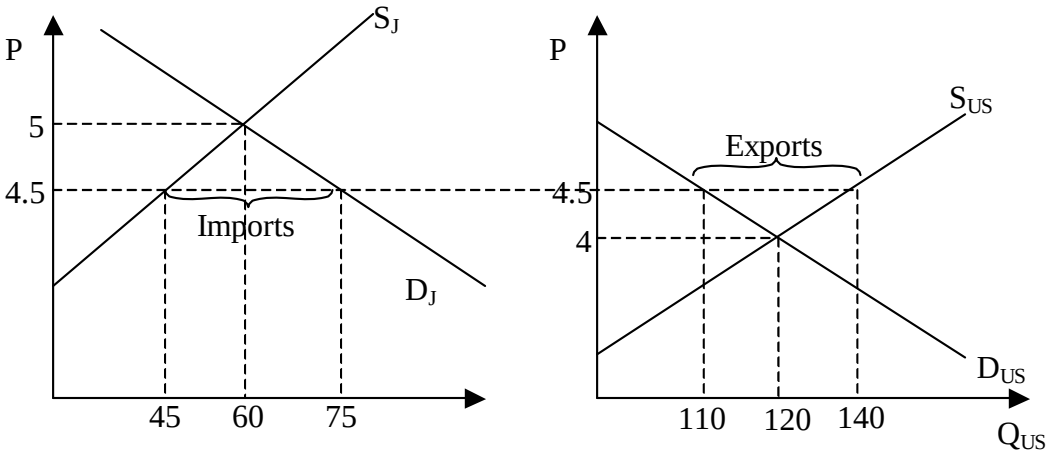


Alas, notice we have a problem.

At 4 stereos p/computer, American consumers (D_{US}) are willing to buy 120 computers and American producers (S_{US}) are producing 120 computers. The American computer market clears exactly. There are no computers "left over" to export to Japan. The Japanese consumer cannot import the 50 units they were in need of.

What to do? Well, you could just forget about the whole trading thing. The Japanese price rise back up to 5, the American price would stay at 4 and that would be that. But because domestic prices are different, there is scope for trade between Japan & US, so something else is bound to happen. Japanese demand for imports will bid up the price of computers on the *American* market.

Suppose the price of computers falls to 4.5 in Japan and rises to 4.5 in America. As we see from the diagram above, at that price, the US consumers will demand 110 computers and US producers would build 140 computers, creating an excess of 30 computers. *Those* could be exported to Japan! And if Japanese excess demand at the price of 4.5 happens to *also* be 30 computers, then the world's markets have cleared. We see this balance in the picture below:



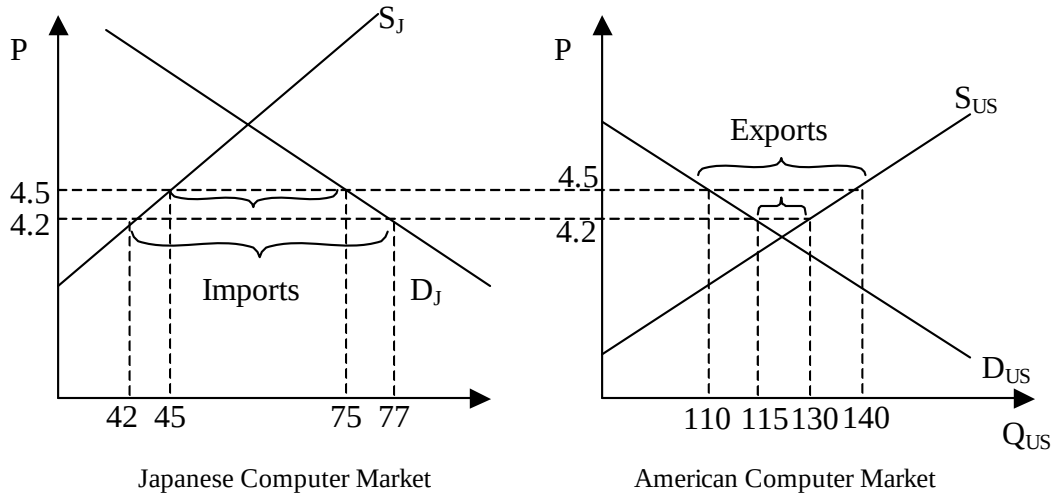
Wonderful! At the market price of 4.5 stereos per computer, Japanese computer imports = American consumer exports or, equivalently, the Japanese consumer shortage has been exactly matched by an American computer glut. All is well with the world.

A Few Observations

(1) In the pictures above, you see the Japanese and American computer markets. Where are the stereo markets? They are implicitly in the diagrams. It's hard to explain where. But remember that our prices are expressed in terms of stereos per computer and, as we have only two goods (stereos & computers), exports/imports of computers will be matched by reverse import/export flows of stereos. So, they're really there, underlying the story.

(2) We picked 4.5 as the market price arbitrarily and showed that it cleared world markets. What would happen if we picked another price, say 4.2? Would that work?

Perhaps. But we would probably get a mismatch. Try to read it from the diagram below. If the market price of computers fell from 4.5 to 4.2, the amount of shortage in Japan would *increase* while the amount of surplus in America would *decrease*. So, Japanese need for American computers would be greater than the amount Americans had available to export.



Or, using our numbers, at 4.5, Japanese shortage was 30 & American surplus was 30, so Jap. imports = US exports. At 4.2, Japanese shortage is 77 - 42 = 35, while American surplus is 130-115 = 15. So, Jap. desired imports > US available exports. It won't work.

(3) There is another way of reading this in terms of *total world demand & supply*. (in our little example, the "world" is composed only of Japan & America)

At the price of 4.5, *total* world (Japan & America) demand for computers ($D_J + D_{US}$) is 75 + 110 = 185, while *total* world supply of computers ($S_J + S_{US}$) is 45 + 140 = 185, so *total demand = total supply*, i.e. world markets clear, and the world is happy.

At the price of 4.2, total world demand is 77 + 115 = 192, while total world supply is 42 + 130 = 172. So total world demand is greater than total world supply. There is a worldwide shortage of computers, a rather unhappy situation. Applying the Law of Markets now on a world scale, there will be pressure on the market price of computers to go back up to 4.5..

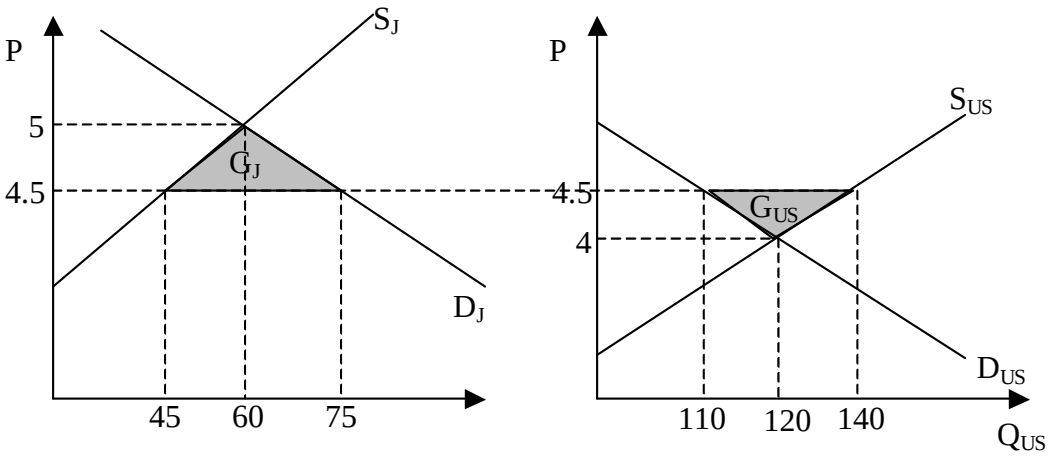
(4) This leads to a final observation. By taking demand into consideration, we no longer need to say that exchange price is going to be "somewhere" in between 4 and 5 stereos per computer. We can actually be precise. It is going to be 4.5 and only 4.5 will "work".

In sum, taking demand into consideration, we have improved on our earlier story. The theory of comparative advantage will tell us only *which* good to specialize in, the *direction* of trade which should be followed and a rather wide range for prices. But it doesn't give us the exact *amount* of trade or the exact *price* at which this trade will be conducted. For that, we need to bring in demand.

GAINS FROM FOREIGN TRADE

Can we also calculate the exact "gains from foreign trade", the rabbit out of the hat, in this example? Yes indeed. They are actually directly visible in the diagram.

Look at the diagram below and let me state it boldly and badly: the gains from trade accruing to Japan is the area of the "little triangle" on the left (G_J in figure below) and the gains from trade accruing to America is the area "little triangle" (G_{US}) on the right. The *total* gains from trade for the two nations is the *sum* of the areas of the triangles.



Japanese Computer Market American Computer Market

In a nutshell, the areas of the triangles represent the *savings* consumers & producers have made by importing their shortages/exporting their surpluses rather than allowing their domestic markets to clear by themselves. Keeping your eye on these little triangles is helpful. Remember how we explained before that the closer the exchange price moves to the buyers' price, the greater the share of the gains from trade is taken by the seller (& vice-versa)? Well, you can see this here too. If you push the world price down from 4.5 to 4.2 (i.e. closer to the domestic American price of 4), the area of the Japanese triangle grows, while that of the American triangle shrinks. In other words, the closer we get to the American domestic price, Japanese gains are increasing, those of America decreasing. Just as we expected.

Pointing this out might not be very helpful without telling you exactly why or telling you how to compute the gains. We turn to that next. (For preliminaries, read "Measuring Welfare)

(A) <u>Welfare Gains to Importer</u>

We know in the case of international *trade* that by importing goods from a cheap producer abroad will push prices in the domestic market *below* the domestic equilibrium price.

Let us take our familiar Japan-US computer-stereo example, where Japan was importing computers from the US. Translating our familiar diagram for Japanese computer industry, before trade, the Japanese computer market would look like the following:

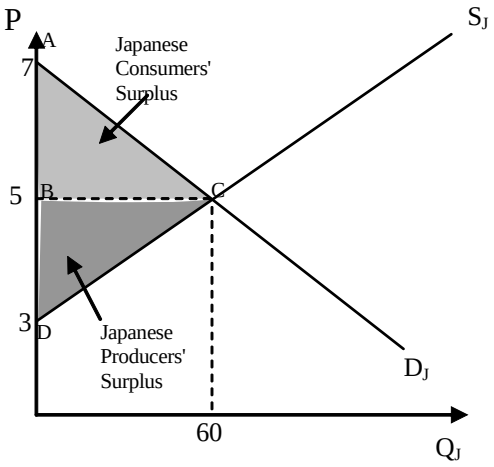


Fig. – Japanese computer market (before trade)

(Note: we added price values 7 & 3 at the vertical intercepts of Demand & Supply in this diagram. We didn't bother with that before, but we will need them here to perform our calculations. We confess we plucked those numbers from thin air. For easy comparison, we decided to make them equidistant from the domestic price, but that need not be the case.)

So, in autarky (before trade), Japanese domestic price is 5 and quantity produced & consumed is 60. In that situation, Japanese consumers' surplus would be the area of triangle ABC and Japanese producers' surplus the area of triangle BCD.

Now, suppose trade begins. As we know from our numerical example, the price of computers in Japan will be driven down to 4.5. Japanese consumption will rise to 75 computers and Japanese production fall to 45 computers, with the difference (30 computers) being filled in by imports from the US.

What is the welfare impact? Intuitively, we expect Japanese producers to be worse off and consumers to be better off. But by how much exactly? And, in total, taking both consumers and producers into account, is Japan better off *as a whole*?

This is where the measure of welfare becomes useful. Look at the figure below. Here we have drawn the impact of trade on the Japanese computer market. As we said, prices are driven down to 4.5.

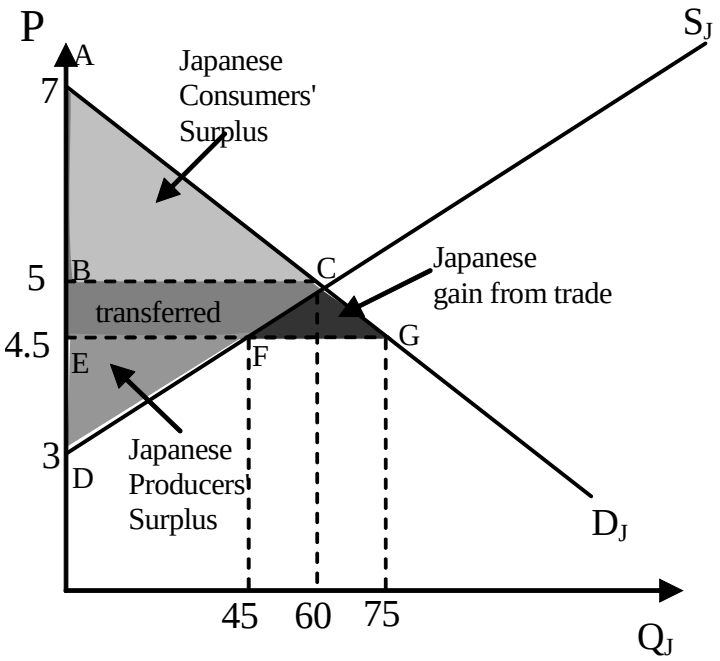


Fig. – Japanese computer market after trade.

The first we notice is that when Japanese prices fall from 5 to 4.5 is that the consumers' surplus *increases*, from triangle ABC to the new and larger triangle AEG, while the producers' surplus *decreases* from the triangle BCD to the smaller triangle EFD.

So, just from this, we see immediately that Japanese consumers are better off (larger consumer surplus) and Japanese producers are worse off (smaller producers' surplus). Moreover, we can, if we calculate the areas, tell exactly by how much. Using our formula for the area of a triangle = (1/2) × height (which is why we needed the intercepts) × base, we see:

Before-trade Japanese consumers surplus = area of ABC = (1/2) × 2 × 60 = 60
After-trade Japanese consumers surplus = area of AEG = (1/2) × 2.5 × 75 = 93.75

So Japanese consumers surplus increased by 33.75. That is the amount of "savings" made by Japanese consumers from trading with the US.

Before-trade Japanese producers surplus = area of BCD = (1/2) × 2 × 60 = 60
After-trade Japanese consumers surplus = area of BEF = (1/2) × 1.5 × 45 = 33.75

So Japanese produces' surplus decreased by 26.25. That is the amount of welfare lost by Japanese producers from trading with the US.

Is Japan better off *on net*? The answer is unambiguously "Yes!" Just from our numerical calculations, we see that Japan as a *whole* better off because the *increase* in Japanese consumers' surplus is *larger* than the decrease in Japanese producers' surplus. Exactly how much better off? Well, subtracting the producers's loss from the consumers' gain, Japan as a whole has gained, on net, 7.5 (= 33.75 – 26.25). (gained 7.5 what? 7.5 stereos-worth of stuff. Stereos are our "currency" measure, remember?) This 7.5 is our "rabbit-from-the-hat", the *pure gains from trad*e with the US.

We can see the net gain immediately from our diagram, without actually having to do calculations. Diagramatically, the amount of producers surplus *lost* was the area of the polygon BCFE (which if you do the calculations, will be 26.25) , but the amount of consumers' surplus *gained* is the polygon BCGE (area = 33.75). So, just from the diagram, we can see that area of BCFE < area of BCGE (which our calculations confirm).

We can be more precise. Notice that the polygon BCFE is part of the new Consumers' Surplus AEG. That means the entire loss of producers' surplus was *transferred* to the consumer surplus. So BCFE merely represents an intra-Japan transfer of welfare from producers to consumers. But the new consumer surplus has an extra bit, a bit that was *not* transferred from producers: the tiny triangle CFG. That little triangle is the pure gains from trade – the 'rabbit out of the hat'. To double check, do the calculations: the area of CFG = $(1/2) \times 0.5 \times 30 = 7.5$. Exactly what we said.

This confirms what we said earlier: that the shaded area of the triangle under the intercept represents the pure "gains from trade" Japan is enjoying.

(B) <u>Welfare Gains to Exporter</u>

What about the exporting country, i.e. the US? Well, it gains too. How much? Let us go through the same exercise. The figure below depicts the after-trade situation of the US (again, we added values for the vertical intercepts, 8 & 0, to make our calculations possible; in this case, we've also adjusted the quantities in our example to ensure that we get perfect triangles and use the simple formula for triangle area; otherwise, we'd have to use integration calculus.).

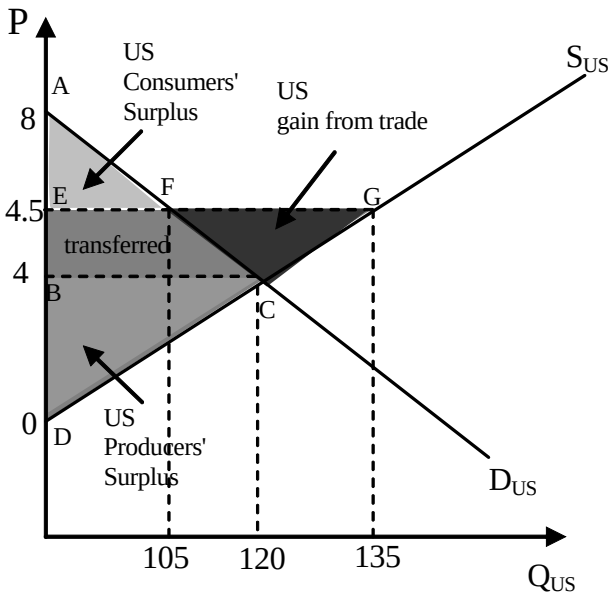


Fig. – US computer market after trade

So let us go through the same exercise. Before trade, US domestic price is 4 and quantity 120. Thus, US consumers' surplus pre-trade is the triangle ABC and US producers' surplus is the triangle BCD. When trade with Japan opens, price rises to 4.5. The consumer's surplus contracts to the smaller triangle AEF (US consumers worse off), while the producer's surplus expands to the much larger EGD (US producers better off). Let us go through the calculations:

Before-trade US consumers surplus = area of ABC = (1/2) × 4 × 120 = 240
After-trade US consumers surplus = area of AEF = (1/2) × 3.5 × 115 = 183.75

So American consumers surplus decreased by 56.25. That is the amount of "savings" lost by American consumers from trading with the Japan.

Before-trade US producers surplus = area of BCD = (1/2) × 4 × 120 = 240
After-trade US consumers surplus = area of EGD = (1/2) × 4.5 × 135 = 303.75

So American producers' surplus increased by 63.75. That is the amount of windfall gains made by American producers from trading with Japan.

Again, we ask: is the US *on net* better off? Again, the answer is yes: the amount of consumers' surplus *lost* (the polygon EFCB, area = 56.25) is *smaller* than the amount of producers' surplus gained (the polygon EGCB, area = 63.75). So, on net, US as a whole is better off with trade.

And, once again, being more precise, the polygon EFCB represents the mere intra-US transfer of surplus from US consumers to US producers. The net gain, the *pure gain from trade* for the US is small triangle CFG, which we can calculate to have area = (1/2) × 0.5 ×

30 = 7.5 - which, not coincidentally, is the exact difference between the producers' gain and the consumers' loss (7.5 = 63.75 – 56.25).

(C) <u>Welfare Gains Globally</u>

So computer-wise, both US and Japan as a whole gain from trade – if gains are measured in consumers' and producers' surpluses. That is why when we combine the diagrams into the one mega-diagram, we take note of the little "gains from trade" triangles.

To summarize by colored areas:

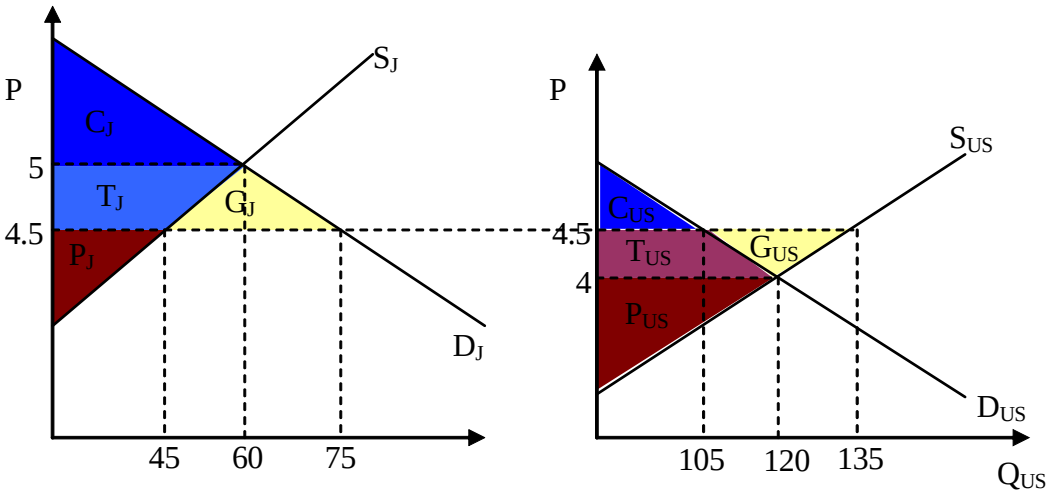


Fig. – Computer markets before and after trade

Before trade: Japanese Consumer Surplus = C_J Japanese Producer Surplus = $P_J + T_J$	**Before trade**: US Consumer Surplus = $C_{US} + T_{US}$ US Producer Surplus = P_{JS}
After Trade Japanese Consumer Surplus = $C_J + T_J + G_J$ Japanese Producer Surplus = P_J Transferred surplus (prod to cons) = T_J Gains from trade = G_J	**After Trade** US Consumer Surplus = C_{US} US Producer Surplus = $P_{US} + T_{US} + G_{US}$ Transferred surplus (cons to prod) = T_{US} Gains from trade = G_{US}

Of course, this is not the complete story, since there is a reciprocal story in the stereo market, where US stereo consumers' surplus increases and Japanese stereo producers surplus increases.

This brings up the question: is the increase in US stereo consumers' surplus exceed the *fall* US computer consumers' surplus? Are US consumers *on the whole* better off? The answer is unambiguously yes. Think of it this way: the US computer consumer's surplus declined by a small, oddly-shaped polygon (the "transferred" bit), but the US stereo consumers' surplus will increase like the Japanese computer consumers' surplus did – by the "transferred" polygon *plus* the pure gains triangle. Since in this simple two-good example where we pay for computers *with* stereos, everything in the computer market matches reciprocally in the stereo market. In other words, the area of the transfer polygon in the computer sector will be identical to the area of the transfer polygon in the stereo sector. So the transfers cancel out. All that is left is the pure gains from trade which the US stereo consumer will get *in addition*. And we already know what that is: 7.5 stereos.

(Of course, they may not be the exact same individuals – a particular US computer consumer may not be interested in this stereo windfall. But US consumers as a *group* gain 7.5 stereos on net.)

THE INVISIBLE HAND THESIS

In discussions of comparative advantage, we have been playing with all sorts of examples, numbers & diagrams to be able to identify gains from trade. I have shown that these gains exist. But I have probably not convinced you that these gains *will* be realized. There is a world of difference between identifying what traders *should* do and what traders actually *do*. Just because gains from trade are possible doesn't mean that the participants will realize that and undertake it.

But now I assert: *they do*. It is a bold assertion and, admittedly, here I am on weaker ground. But the thesis is not without merit.

Consider the case of our US & Japan again. Suppose computer manufacturers place their goods on sale at the domestic price (5 stereos per computer for Japan, 4 stereos per computer for the US) and make them freely available to whomever wants to buy them (no constraints on quantity). Looking at price alone, *everybody* would try to buy American rather than Japanese computers.

There is consequently a temptation for Japanese computer firms to close up shop and go produce stereos instead. Similarly, American stereo producers would be tempted to convert their stereo factories into computer-manufacturing facilities. In other words, *there is an automatic tendency to specialize into the good in which you have a comparative advantage!*

This lends credence to the theory of comparative advantage as not merely a *recommendation*, but a *description* of what happens. As David Ricardo put it "It is this principle which determines that wine shall be made in France and Portugal, that corn shall be grown in America and Poland and that hardware and other goods shall be manufactured in England." (Ricardo, 1817, *Principles*, p.81). You don't need to *tell* your producers to specialize in this or that. They'll do so on their own. And the likelihood of them making a "mistake" and specializing in the wrong thing is quite low.

This is an example of the doctrine of the "Invisible Hand", the term coined by Adam Smith (1776) to describe how the personal pursuit of profit unknowingly promotes the welfare of the general public. Or, to use the earlier monicker from Bernard de Mandeville's *Fable of the Bees* (1713), that "private vices are public benefits". Or to update that with a more recent cultural icon, the fictional Wall Street character Gordon Gekko: "Greed is good".

The "invisible hand" thesis is often regarded as an ethical paradox. Equating private selfishness with public philanthropy is a conclusion that may sit uncomfortably (and has sat uncomfortably) with many. Many people, notably moral philosophers and theologians, have denounced or warned against leaping too quickly from economic analysis to moral conclusions. But the invisible hand thesis has been a driving force behind arguments for free trade, indeed expanded into the political ideology of *laissez-faire* **liberalism** (old or neo-). So it is worth paying closer attention to it.

ASSUMPTIONS

There are many caveats to the Invisible Hand thesis. In particular, the following conditions must be met to some degree to ensure that self-seeking people and firms spontaneously specialize and realize gains from trade on their own:

(1) ***Access to Trade*****:** It is self-evident that trade must be reasonably free of physical and political obstacles for the invisible hand thesis to work. This should be obvious. If a country is landlocked or isolated and cannot cheaply transport goods from overseas, or if its transportation infrastructure, ports and airports are prohibitively expensive, or if there is some domestic laws (e.g. quotas) or internationally-imposed sanctions or wartime blockades prohibiting or curtailing trade with that country, then this process will hardly get started. There will be very little pressure on Japanese computer firms to "switch" to stereo-production.

(2) ***Competition*****:** The degree of competition *within* a nation matters too. If there is a single Japanese computer producer, it will probably be charging exorbitant prices and making enormous profits from its monopoly position. After the opening of trade, competition from American computers may cut into those profits, but will not necessarily eliminate them completely. The Japanese firm may be willing to accept lower, but still reasonable, profits in computer-making rather than being "forced" to switch into stereos.

If, on the other hand, there was intense domestic competition in the computer industry, then any particular Japanese computer-maker will probably not be able to afford the cut in profits from the entry of American computers and be forced to switch to stereos.

So a good amount of competition is a pre-condition to spontaneous specialization.

(3) ***Information*****:** Japanese computer-producers know what their profit margins are; but they might not necessarily know what the profit margins on stereo-production is. They might, for lack of information, just assume that stereo-production is not very profitable and decide to stick to computer-making. So, a precondition for spontaneous specialization is that firms must be reasonably aware of profit opportunities elsewhere in the economy.

(4) ***No Government distortions*****:** The government can easily distort the "signals" from the market in a way that prevents specialization. This is not only by tariffs and quotas (as in 1), but any sort of 'manipulation'. For instance, if the Japanese government offered subsidies to the Japanese computer industry, then that removes pressure for them to go into stereo-making. State-run enterprises are simply an extreme case of this. Similarly, if government imposes price ceilings or floors that mess up the price signals, or introduces labor and capital regulations are so tight that it is quite expensive or cumbersome for them to fire workers or overhaul their factories, then a computer maker might just decide to stick to its current line of work rather than try to change over to stereo-making. Price signals must be clear, factors of production -- like land, labor and capital -- must be mobile from industry to industry.

NEO-LIBERALISM

The "invisible hand" thesis that specialization and trade will happen "spontaneously" has been taken up with fervor by the so-called "Neo-Liberal" or "Neo-Classical" school of economic policy. This school of thought, which has gradually grown in influence since the 1980s, has been successful in forwarding its ideas in many governments and international institutions.

But the Neo-Liberal school is very well aware that assumptions (1)-(4) need to be met in order to make invisible hand thesis work. Consequently, the main force of their policy prescriptions are to ensure that those conditions are met.

(1) "Access to Trade" -- many Neo-Liberals advocate not only the removal of artificial barriers to trade (like tariffs & quotas) but also recommend things like public investment in trade-related infrastructures (like ports, highways, etc.), clarification & simplicity in national laws of contracts, etc. Anything that makes trade cheaper & easier is a good thing.

(2) "Competition" -- Neo-Liberals tend to support domestic anti-trust policy to prevent the emergence of monopolies. They also encourage the development of local financial institutions and lending practices to help small firms gain on the big ones. If home-grown domestic competitors fail to emerge, an alternative is to ease up foreign-ownership rules so that foreign firms may be set up in the country and make competition happen.

(3) "Information" - encouraging transparency, disclosure of profits, credible accounting standards, etc. help the wide-spread diffusion of information about which lines of work are the most profitable. The same applies to providing information about employment opportunities, education & retraining, etc. to the workforce to make their transfer to the growing, better-paid sectors easier.

(4) "No Government distortions" -- Here is where the Neo-Liberals are most famous & push harder. They advocate strongly the removal of all government distortions. That means advocating the privatization of State firms, elimination not only of trade-related government policies - such as tariffs quotas, export subsidies and like - but any and all domestic policies that might introduce rigidities or price distortions, such as industrial subsidies, price controls, labor, capital & environmental regulations, etc. that might mislead the price system and impede the proper working of the market system.

If all this is achieved in as many nations as possible, Neo-Liberals argue, specialization will ensue automatically and the gains from trade will be realized spontaneously.

Is the invisible hand thesis *true*?

Some say it is really little more than an article of faith, derived from clever, but incomplete, thinking, driven by a few contrived examples. It certainly cannot be *proved*.

But it is a powerfully appealing thesis and has a great hold not only on economists, but also on policy-makers. And, for better or worse, has guided much political discourse on economic issues from the 19th Century onwards.

The assumption which most people focus on, particularly in discussions of international markets, is the ***freedom of trade***. Natural or artificial barriers to trade -- such as tariffs or quotas -- will prevent these gains from being fully realized. After Adam Smith and David Ricardo laid down their cases, the idea caught on and barriers to trade were gradually dismantled in Britain. Then other countries followed suit. In the latter part of the 20th Century, countries tried to coordinate their efforts to lower them further and set joint rules about them in institutions like GATT (now WTO). And we have recently seen nations get together and eliminate all barriers between them -- as in the EU and NAFTA. And all because of this idea.

PROTECTIONISM

Many things are forgotten in this frenzy towards free trade.

One important one is that **specialization** itself is not a painless affair. By definition, specialization means shutting down some industries. Jobs are lost in many areas, people are forced to move or learn skills they are ill-prepared for and pass through long periods of deprivation and even hunger. Certain regions of a country may be left abandoned into depression for decades.

The theory promises that the new jobs exist out there -- in the new industries into which the nation is specializing, but it is an open question as to *when* these jobs will appear, the quantity and quality of those jobs and how much has to be sacrificed in the interim. That is just one of the various considerations that drive much of the resistance to the lifting of trade barriers.

For this reason, among others, governments insist on a degree of **protectionism** - maintaining hurdles, barriers or distortions that prevent free trade. We shall consider these here.

We can classify protectionist measures by two types: direct policies and indirect policies.

By '*direct*' policies, we mean those government policies that target foreign trade directly and explicitly. These are **tariffs**, **quotas** and **export subsidies**.

By 'indirect' policies, we mean those government policies that target domestic industry and, at least on principle, do not explicitly target trade, but nonetheless do have implications for foreign trade. **Industrial subsidies**, whether for import-substituting or export-promoting industries, come under this heading.

TARIFFS

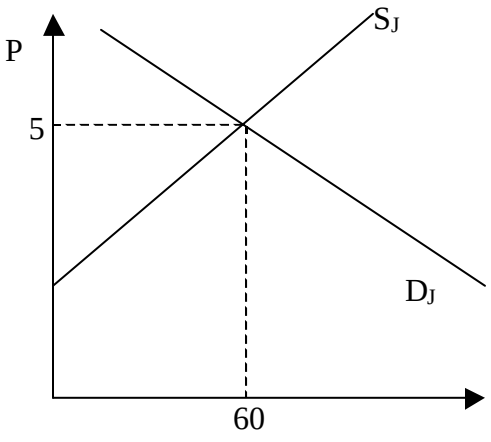
Tariffs are one of the most popular forms of barriers to trade. It is useful to try to analyze what the impact of a tariff might be.

Tariff: a tax on the importation of goods.

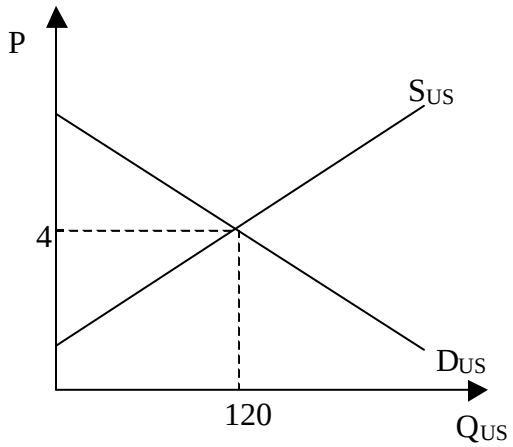
Go back to our earlier example. Suppose we have a "no trade" situation between Japan & America (so Japanese domestic price is 5 & American price is 4).

Suppose now trade is opened but the Japanese government imposes a 25% tariff on importation of American computers. American computers that cost 4 in America will now cost 5 in Japan (5 = 4 to American firms + (0.25) × 4 to Japanese government).

What would be the result? Well, as *all* computers (Japanese or American) cost 5 in Japan. But, as we saw before, at the price of 5, Japanese firms would produce 60 and Japanese consumers will buy 60. Markets clear. There is no longer any excess demand for computers and thus no need to import American computers. The American computer market would thus clear by itself at the price of 4. In sum: the 25% tariff has eliminated *all* trade between Japan & US.



Japanese Computer Market



American Computer Market

But we don't go to this extreme. Suppose Japan imposed a milder tariff of, say, 12% on the importation of American computers. What would happen?

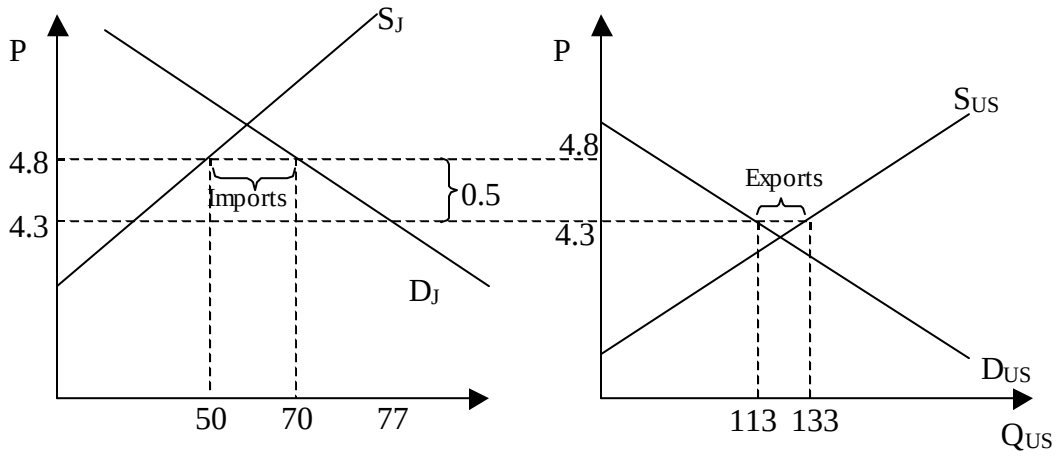
As the domestic price of American computers is 4, then our first instinct is to assume that the price of American computers imported to Japan consumers would rise to 4.48 (= 4 for American firms + (0.12) × 4 for the Japanese government).

Now, 4.48 is approximately 4.5. So using our old numbers, at 4.48, Japanese consumers will want to import around 30 computers from America (give or take a couple). But remember this 4.48 is the price after the tariff in Japan. If a Japanese consumer buys an American computer for 4.48, 0.48 goes to the Japanese government; American firms will *only* be receiving 4.

So the US is *not* facing the price of 4.48 domestically; they are *still* facing the price of 4. And, as we know, at 4, Americans will have no excess supply to export to Japan.

What will happen? Unleash the Law of Market at let prices float around so that they settle where the quantity Japanese consumers decide to import matches what American firms are willing to export. So there would be market adjustments in both Japan & America to make sure that we have it that imports = exports in the end.

The final effect of the 12% tariff would be something like that depicted in the diagram below:



Recall that when there was no tariff ("free trade"), the "world price" of computers was 4.5 (in both America and Japan) and 30 computers were exported to Japan.

What are the consequences of the 12% tariff relative to that "free trade" position?

(1) **"Wedge" in prices**. There is no longer a single world price. In the free trade case, both Americans & Japanese consumers faced the same price of 4.5. With the 12% tariff in place, Japanese & American consumers now face **different prices**.

-- The price of computers in Japan has *risen* to 4.8.
-- The price of computers in America has *fallen* to 4.3.

The *difference* in price (4.8 - 4.3) is 0.50 -- that is exactly the size of the 12% tariff, i.e. what the Japanese government collects on every computer imported.

[Approximately: 12% of the American price (4.3) is actually 0.516]

So that tariff has created a *wedge* or *gap* between domestic & foreign prices for the same good. Notice that Japanese imports = 20, while American exports = 20. So the world markets *clear*.

(2) **Lower Volume of Trade**: Notice also that the *quantity* of goods imported/exported has fallen (with no tariff, exports = imports = 30; with the tariff, exports = imports = 20).

(3) **Smaller Gains from Trade**: You can see from the diagram that *both* the Japanese "triangle" and the American "triangle" are smaller then when there was no tariff. Both have smaller gains from trade.

So the net effect of a tariff is that the foreign & domestic prices diverge & the volume of trade declines & gains from trade are smaller.

But a nagging question remains: from a welfare point of view, won't the smaller gains from trade be offset by the government tariff revenues, which can now be spent on improving the lives of citizens? The answer is no. It is an elementary graphical exercise to prove that the revenues collected by the government from the tariff are *less* than the losses from reducing the gains from trade. Tariffs produce a deadweight loss. Let's turn to that next.

WELFARE IMPACT OF TARIFFS

Just like excise taxes introduce a deadweight loss on internal markets, protectionist measures like tariffs also introduce deadweight losses on foreign trade. This is a bit intricate to show, but worthwhile to just make sure.

As you know, the impact of a tariff is to reduce the volume of trade, raise the price in the importing country and reduce the price in the importing country, the wedge between the two prices being the exact size of the tariff.

For example, taking our two markets, Japan and the US, starting from the free trade position (equilibrium = 4.5), suppose a tariff of 0.5 is introduced and the final position looks something like the following:

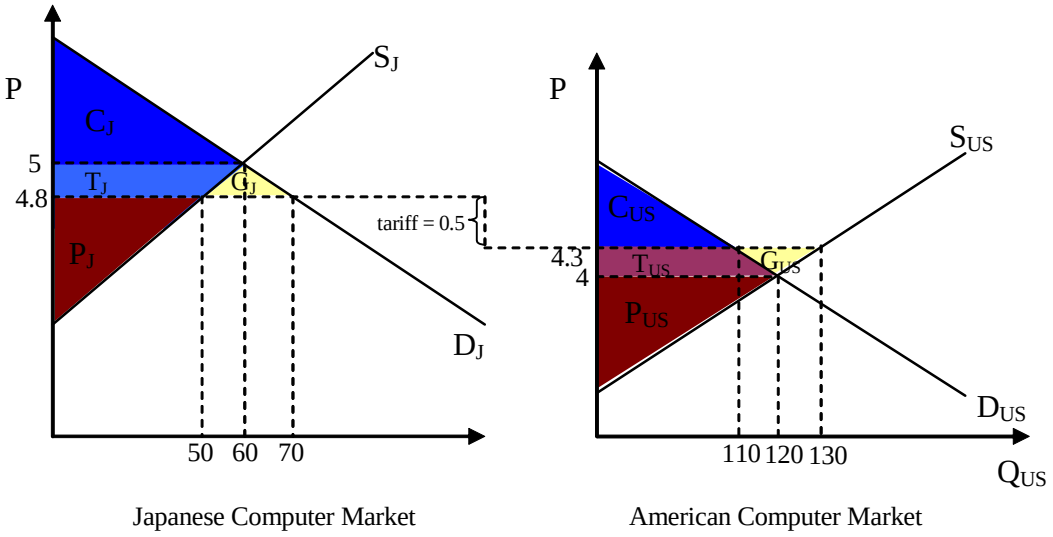


Fig. - Welfare of tariff

where price in Japan is 4.8, price in the US is 4.3, and the volume of trade is 20. The areas are labeled and color-coded in the same way as in the earlier free trade diagram:

For Japan:
- $C_J + T_J + G_J$ is the total consumer surplus in Japan,
- P_J is the producer surplus in Japan
- T_J is the amount of surplus transferred from producers to consumers in Japan
- G_J is the net gain from trade for Japan

For US:
- C_{US} is the consumer surplus in the US,
- $P_{US} + T_{US} + G_{US}$ is the total producer surplus in the US
- T_{US} is the amount of surplus transferred from consumer to producers in US
- G_{US} is the net gains from trade for US.

Notice that now, under the tariff, G_J and G_{US} (the net gain triangles) are *smaller* than the equivalent triangles in the free trade position (in the earlier figure). The amounts of surplus transferred between classes (T_J and T_{US}) are also smaller than their equivalent under free trade.

So, relative to the free trade position, what are the benefits and costs of introducing a tariff? The beneficiaries are Japanese producers (who now lose less producers' surplus from trade) and US consumers (who now lose less consumers' surplus). The losers are Japanese consumers (who gain less consumers' surplus) and US producers (who gain less producers' surplus).

At the risk of causing a color-coded nightmare, let us superimpose the tariff diagram on the free trade diagram to compare the areas:

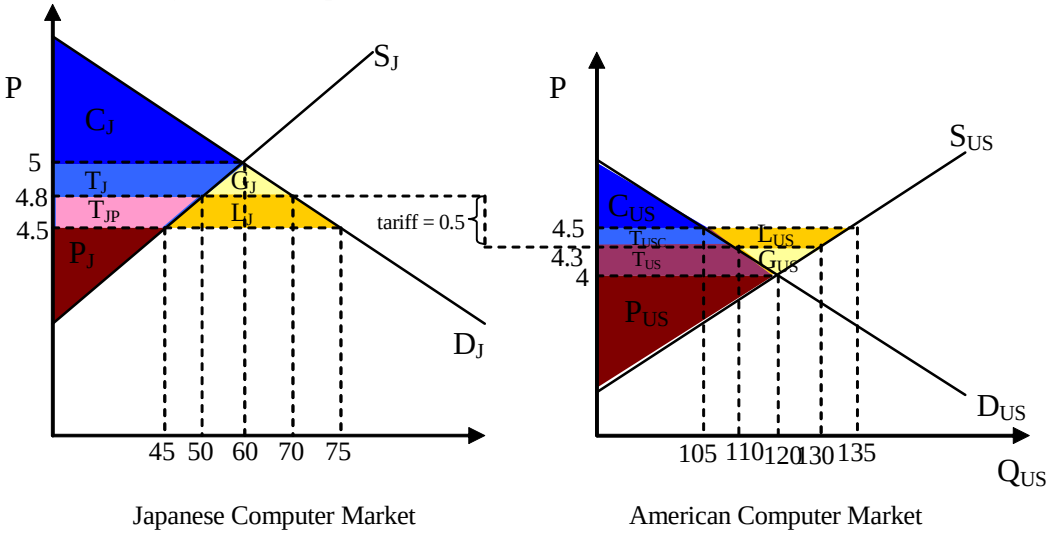


Fig. - Welfare losses of Tariff (relative to Free Trade)

Let's look carefully.

- Under free trade, the area transferred from Japanese producers to Japanese consumers was the entire polygon $T_J + T_{JP}$. But under the tariff, only T_J is transferred. So T_{JP} are the *gains* to Japanese producers from introducing the tariff.
- Under free trade, the net gains from trade accruing to Japanese consumers (without cost to Japanese producers) was the triangle $G_J + L_J$. But under the tariff, the net gain is only G_J. So L_J are the *net loss* to Japan from introducing the tariff.

Similarly in the US:
- under free trade, the area transferred from American consumers to American producers was the entire polygon $T_{US} + T_{USC}$. But under the tariff, only T_{US} is transferred. So T_{USC} are the *gains* to American consumers from the introducing the tariff.

- under free trade, the net gains accruing to American producers (without cost to American consumers) was the triangle $G_{US} + L_{US}$. But under the tariff, the net gain is only G_{US}. So L_{US} is the *net loss* to the US from introducing the tariff.

Since transferred T-something amounts are just shifting gains between domestic sectors, the total net loss of global welfare from introducing the tariff is just the areas of the yellow polygons L_J and L_{US}.

So the areas L_J and L_{US} are the welfare costs of a tariff.

But what about the Japanese government? Remember, the government is collecting money from the tariff. And that counts as a benefit (at least to the government). How much? Well, the tariff is 0.5 and the volume of trade is 20, so the revenues to the Japanese government are: $0.5 \times 20 = 10$.

Now a little arithmetic trick: notice that $10 = 6 + 4$, and $6 = (0.3 \times 20)$ and $4 = (0.2 \times 20)$. In other words:

$$0.5 \times 20 = (0.3 \times 20) + (0.2 \times 20)$$

Why am I bothering breaking it down like that? Because I want to represent the entire gain to the government (10) by the sum of the areas of two rectangles. A rectangle with length 20 and height 0.3 will give me a rectangle with area 6. A rectangle with length 20 and height 0.20 will give me a rectangle with area 4. So those two rectangles together give us the total Japanese government gain (10).

Let me now show you where the rectangles are in the diagram:

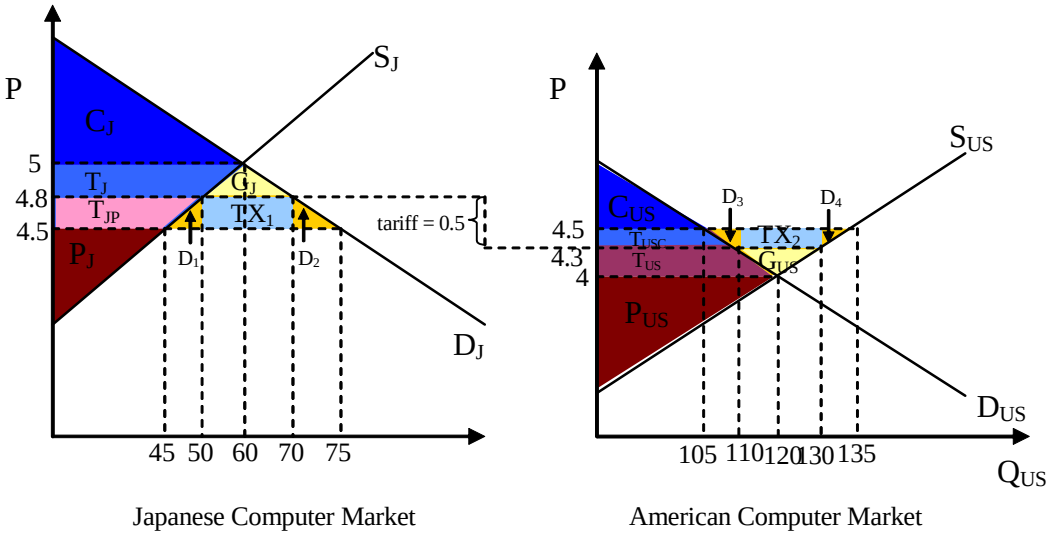


Fig. - Tariff Gains to Japanese government

Ugly, isn't it? But look carefully on the left (Japanese) diagram. The light blue rectangle TX_1 is a rectangle of length 20 (= 70 - 50) and height 0.3 (= 4.8 - 4.5). So TX_1 is a rectangle of area 6. On the right (American) diagram, the light blue rectangle TX_2 is a rectangle of length 20 (= 130 - 110) and height 0.2 (= 4.5 - 4.3). So TX_2 is a rectangle of area 4.

So: total gain to Japanese government from tariff = 10 = 6 + 4 = area of TX_1 + area of TX_2.

But notice that when comparing figures, on the left, blue rectangle TX_1 is *smaller* than yellow polygon L_J. And on the right, blue rectangle TX_2 is *smaller* than yellow polygon L_{US}. In other words,

$$TX_1 + TX_2 < L_J + L_{US}$$

So the total gain to the Japanese government ($TX_1 + TX_2$) is *less* than the loss of global welfare $L_J + L_{US}$. In other words, The total tariff revenue gains made by the Japanese government are *less* than the total loss of welfare to Japan and the US from the resulting smaller volume of trade.

The difference between the areas are the tiny little triangles D_1 and D_2 in the diagram on the left, and D_3 and D_4 in the diagram on the right. *These* are the deadweight losses, i.e.

$$\text{total deadweight loss from introducing the tariff} = D_1 + D_2 + D_3 + D_4$$

So, through these complicated graphs, we can see that introducing a tariff is a net loss to the world.

As the tariff has the same qualitative impact of the quota, the same analysis can be used to analyze the welfare impact of a quota - except that the "tariff revenues" should be interpreted as the windfall profits made by those exporters who are allowed to fulfill the quota. Again, the gains made to the lucky exporters are less than the welfare trade loss of the quota.

QUOTAS

Another form of trade barrier that is popular is the imposition of quotas on imported goods.

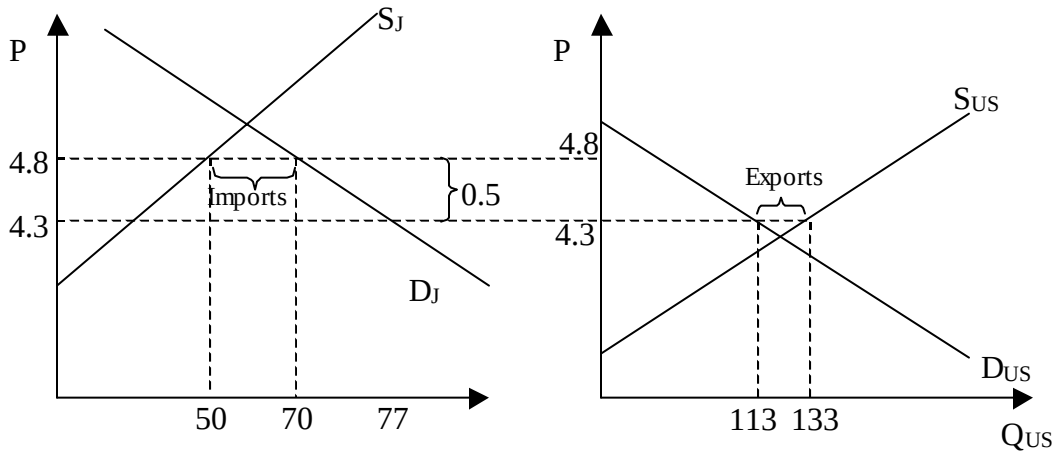
Quota: maximum amount of a good that is legally permitted to be imported into a country.

Suppose Japan imposed a quota that forbade imports of more than 20 American computers. In this case, the old free market price of 4.5 can no longer work (as that implied the importation of 30 American computers).

As we saw in our old diagram, if prices stayed at 4.5, Japanese producers would supply 45 computers and, as American imports now limited to 20, would mean that total supply available to Japanese consumers is 65. But at the price of 4.5, Japanese demand would be 75. There is a shortage of 10 computers. By the Law of Markets, the Japanese price for computers would have to *rise* to eliminate that shortage and clear the market.

What about America? Well, at the price of 4.5, American firms produced 140 and American consumers demanded 110, leaving an excess of 30 to be exported. But now that only 20 can be exported to Japan. That leaves American market with an excess of 10 computers unsold. Again, by the Law of Markets, the American price would *decline* to eliminate the excess and clear the market.

The net effect is depicted below:



Notice that Japanese prices are now 4.8 while American prices are 4.3. At these prices, American exports = Japanese imports (as dictated by the quota of 20). Both markets clear.

So the net effect of quotas: it creates a gap between domestic & foreign prices & reduces volume trade & reduces gains from trade.

TARIFFS vs. QUOTAS

You will notice that the picture in our tariff section & the picture in our quota section are *identical*. The gap between Japanese & American prices are identical (0.5) and the quantity traded is the same (20 computers). This leads to a famous observation:

Anything that can be achieved by a tariff, can also be achieved by a quota, and vice-versa.

So is there no difference between a tariff and quota? There is.

(1) *Reaping the Benefit*.

Tariff: The revenues from the tariff are, in our example, 10 = 0.5 (tariff per computer) × 20 (quantity of computers imported). All this revenue goes to the Japanese government. The principal losers are the Japanese consumers who have now to pay a higher price for imported computers & American firms who now receive a lower price for them.

Quota: In the quota case, the revenue doesn't go to the government. It goes in the form of profits to the Japanese computer makers *and* those few lucky American firms who get to fill the Japanese import quota (those who don't, lose out).

(2) *Spending the Benefit*.

Tariff: As the government receives the tariff revenues, it is reasonable to assume that at least it might spend it on things which are beneficial to Japanese consumers (schools, hospitals, etc.). That might offset the "pain" of Japanese consumers.

Quota: Private firms receive the quota revenue, so it is likely that these will be passed on to their shareholders (whomever they might be) and not Japanese consumers as a whole.

So, the tariff seems more acceptable than a quota on "social equity" considerations.

(3) *Efficiency*:

Tariff: As we saw, tariffs reduce the amount imported to 20, but it doesn't say *which* American company is to provide those 20 to Japan. As any US firm can provide them, American companies are bound to compete with each other on efficiency.

Quotas: Quotas work differently. *Who* gets to fulfill the Japanese computer quota is decided arbitrarily by the government. The fulfillment of the quota is thus a *political* process, very prone to corruption, and gives firms no incentive to compete on efficiency.

In sum: although tariffs & quotas are both worse than free trade, if you have to impose one of them, it is probably better to impose the tariff rather than the quota.

EXPORT SUBSIDIES

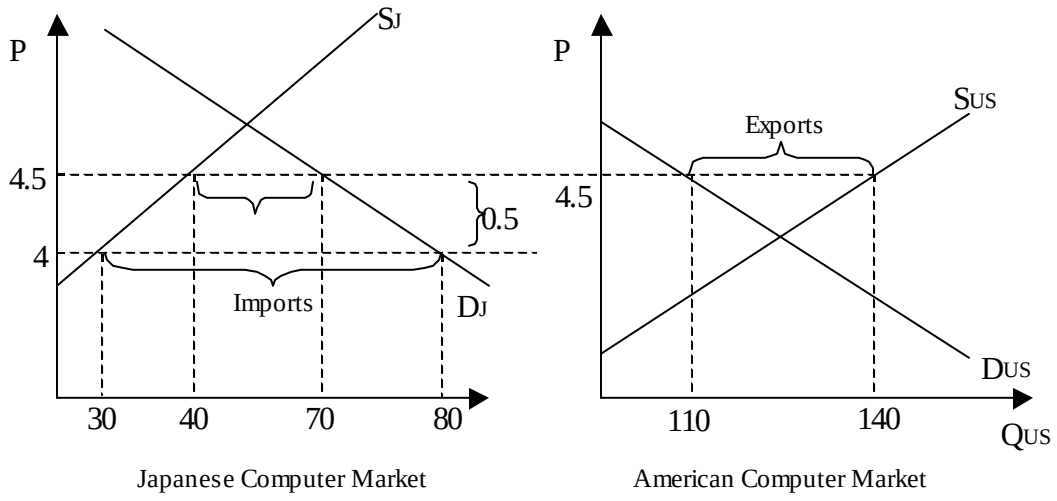
Instead of tariffs & quotas, many governments offer *export subsidies* (sometimes also called *bounties*).

Export Subsidy: A payment by the government to domestic firms for goods exported.

Note that the export subsidy is not simply a cash handout to domestic firms. It is a payment *per unit* exported. That payment is *not* made if the unit is sold by the same company domestically.

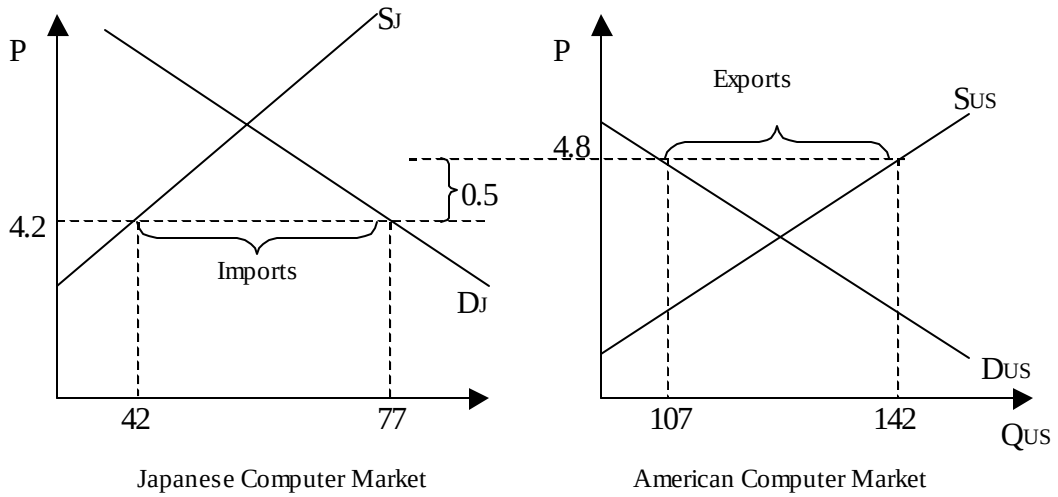
Returning to our old Japanese-US computer-stereos example, the American government might offer American firms a cash payment for every computer they manage to sell to Japan *but* this subsidy does not apply if they sell their computers at home in the US.

An export subsidy works more-or-less like a tariff -- in reverse. If American companies were selling computers to Japan at 4.5 per unit, the export subsidy of, say, 0.5 per unit sold, allows them to lower their prices there to 4.



But as we know, at the price of 4 stereos per computer, Japanese consumers will flock to buy American computers (80), while Japanese computer firms will be forced to cut back production (30). So, on net, Japanese demand for imported American computers has exploded to 50. But, in the American market, the price is still 4.5, so America is still only generating an exportable surplus of 30.

We know what will happen next. Unleash the Law of Markets of course and the prices will adjust to something like the following:



So American prices *rise* to 4.8 while Japanese prices *fall* to 4.2. At this new situation, Japanese imports are 35 (= 77 - 42) which perfectly match American exports (35 = 142 - 107).

Notice several things: firstly, as in the tariff & quota case, the subsidy creates a wedge between domestic & foreign prices, but this time it is the price in the exporting country that is higher.

Also the *volume* of trade has increased (from 30 to 35), so it is not really a "barrier" to trade, is it? Even the gains from trade (the triangles) are larger for both.

Japanese consumers certainly seem better off from the lower prices. If you look carefully, American consumers also might be a bit better off -- they may pay more for computers (price rose from 4.5 to 4.8), but, reciprocally, their imported stereos are cheaper (their prices fell from 0.22 to 0.21 computers per stereo) & they get more of them.

Who's complaining?

The Japanese. While an export subsidy is not a "barrier" to trade, it *is* an unfair trading practice. It is clear that American computer producers are benefiting at the expense of Japanese computer producers, who have to reduce their market share.

Another complainant are the American consumers -- because, remember, this subsidy is coming out of taxes. *They* are ultimately footing the bill.

Export subsidies generate what economists call the phenomenon of **dumping**, i.e. selling abroad at a lower price than it costs at home.

International organizations, like the WTO, have condemned "dumping" because it is often predatory. Big firms often try selling abroad at very low prices abroad just in order to

bankrupt all their foreign competitors and gobble up the market share. Once the foreign competitors are out of business for good, the successful "dumper" has suddenly acquired himself a monopoly -- and can proceed to raise prices enormously. What the foreign consumers thought was a lucky windfall of cheap imports today may turn into exorbitant price-gouging tomorrow.

Export-subsidies can be seen as a government-created "dumping" situation. It is duly discouraged by WTO rules.

What about welfare? In fact, as we will see**,** export subsidies cause deadweight losses. Even though trade expands, and the net gains from trade 'triangles' increase, we have to remember export subsidies are *paid* for by government taxation. It is easy to show that the taxation necessary to fund an export subsidy *exceeds* the net gains from greater trade, thus producing a deadweight loss.

WELFARE IMPACT OF EXPORT SUBSIDIES

It may seem intuitive that tariffs produce a net welfare loss - after all, the gains from trade are tremendously reduced by the tariff. But an export subsidy actually *increases* trade. So it seems, at first glance, that export subsidies might be a welfare gain.

Suppose, starting from the same free trade position (equilibrium = 4.5), the US government introduces an export subsidy of 0.5. The end result will look like the following:

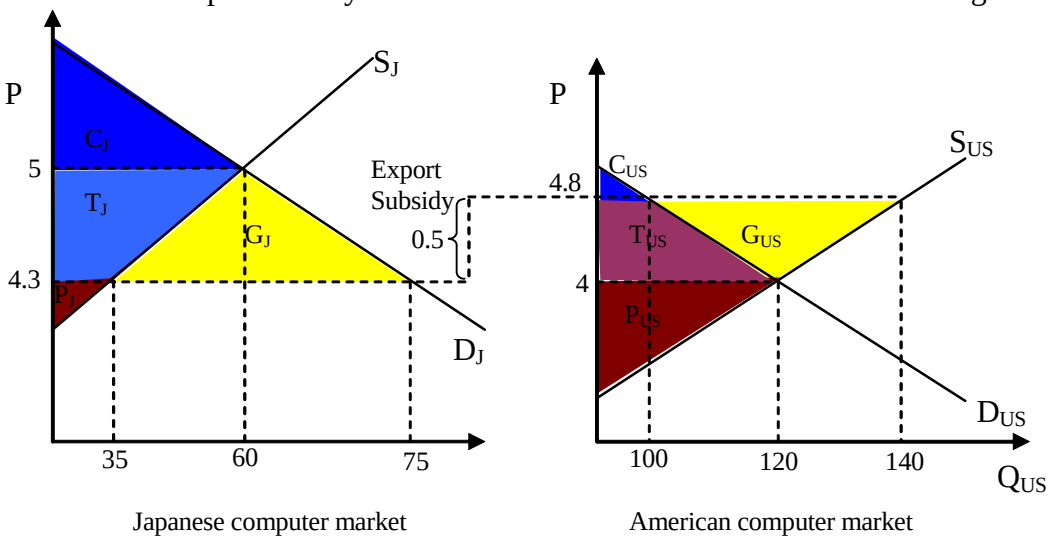


Fig. - Trade with Export Subsidy

where price in Japan is 4.3, price in the US is 4.8, and the volume of trade is 40. The areas are labeled and color-coded in the same way as in the earlier free trade diagram:

For Japan:
- $C_J + T_J + G_J$ is the total consumer surplus in Japan,
- P_J is the producer surplus in Japan
- T_J is the amount of surplus transferred from producers to consumers in Japan
- G_J is the net gain from trade for Japan

For US:
- C_{US} is the consumer surplus in the US,
- $P_{US} + T_{US} + G_{US}$ is the total producer surplus in the US
- T_{US} is the amount of surplus transferred from consumer to producers in US
- G_{US} is the net gains from trade for US.

Notice the volume of trade - and the gains from trade - are much *larger* with the export subsidy than under free trade alone. Again, superimposing the free trade upon the export subsidy diagram, we can compare the differences:

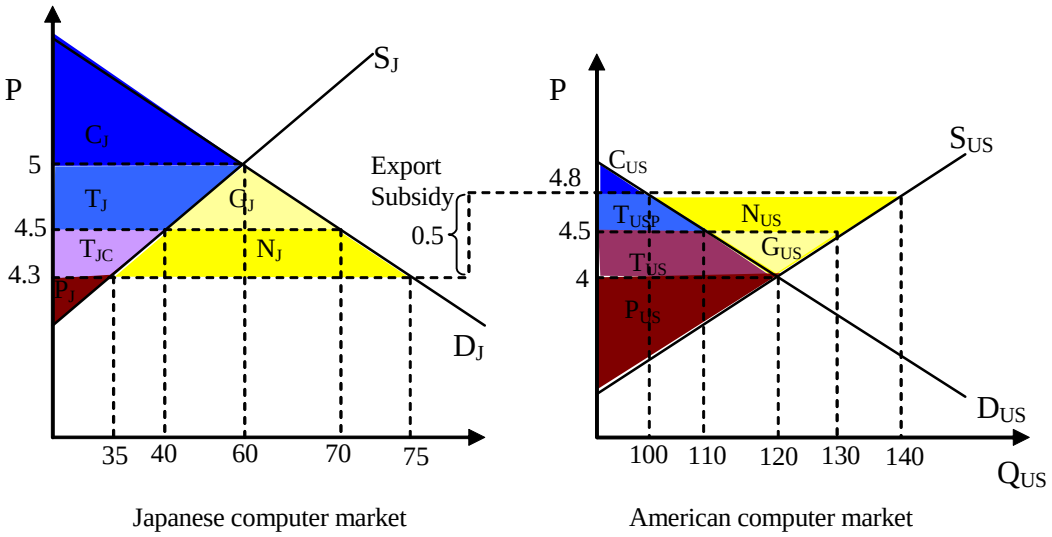


Fig. - Welfare gains of Export Subsidy (relative to Free Trade)

Let's decipher the changes:

Start with Japan:

- Under free trade, the area transferred from Japanese producers to Japanese consumers was merely the polygon T_J. But now with the export subsidy, there the entire amount $T_J + T_{JC}$ is transferred. So T_{JC} are the *loss* to Japanese producers from introducing the export subsidy. This will be fully transferred as gains to Japanese consumers.
- Under free trade, the net gains from trade accruing to Japanese consumers (without cost to Japanese producers) was the triangle G_J. But with the export subsidy, the pure gain expands to $G_J + N_J$. So N_J is the *net gain* to Japan from introducing the export subsidy.

Let's move on to the US:
- under free trade, the area transferred from American consumers to American producers was just the polygon $T_{US.}$ But now with the export subsidy, $T_{US} + T_{USP}$ is transferred. So T_{USP} are the *loss* to American consumers from the introducing the export subsidy. This is full transferred as gains to American producers.
- under free trade, the net gains accruing to American producers (without cost to American consumers) was the triangle G_{US}. But with the export subsidy, the net gain is expands to $G_{US} + N_{US}$. So N_{US} is the *net gain* to the US from introducing the export subsidy.

Globally, then, the net gains from the export subsidy are the yellow polygons N_J and N_{US}.

Export subsidy looks all good. A net gain to world welfare.

But you have to remember that US export subsidies have to be paid for by government taxation of the American people. The question is whether the net trade-related gains exceeds or is less than the burden of taxation. We can examine this graphically too.

First let us ask how much taxes are needed. Well, the US government is subsidizing 0.5 per computer exported. Total amount of exports are 40, so the cost to the US government is:

total taxation burden = $0.5 \times 40 = 20$.

Again, we can break this down arithmetically into the areas of two rectangles. That is, $20 = 8 + 12$, an $8 = (0.2 \times 40)$ and $12 = (0.3 \times 40)$, so:

$$0.5 \times 40 = (0.2 \times 40) + (0.3 \times 40)$$

So I can represent the entire tax burden by the sum of two rectangles - one rectangle with length 40 and height 0.2, plus another rectangle with length 40 and height 0.3. The areas of those two rectangles together give us the total US taxation burden (= 20).

Let us place these rectangles on the diagram.

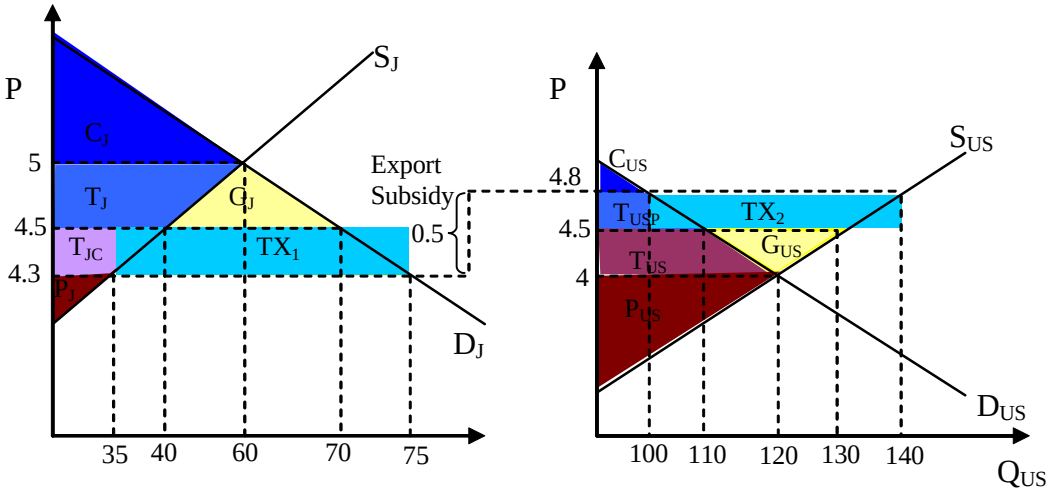


Fig. - Taxation burden of export subsidy

On the left (Japanese) diagram, there is a light blue rectangle TX_1 of length 40 (= 75 - 35) and height 0.2 (= 4.5 - 4.3). So TX_1 is a rectangle of area 8. On the right (American) diagram, the light blue rectangle TX_2 is a rectangle of length 40 (= 140 - 100) and height 0.3 (= 4.8 - 4.5). So TX_2 is a rectangle of area 12.

So area of $TX_1 + TX_2 = 8 + 12 = 20$ = total taxation burden on US taxpayers to pay for export subsidy.

The only question that remains, from a welfare point of view, is whether the US taxation burden ($TX_1 + TX_2$) is greater or lesser than the global net trade-related gains from the export subsidy ($N_J + N_{US}$). To see this, take a look at the diagram below:

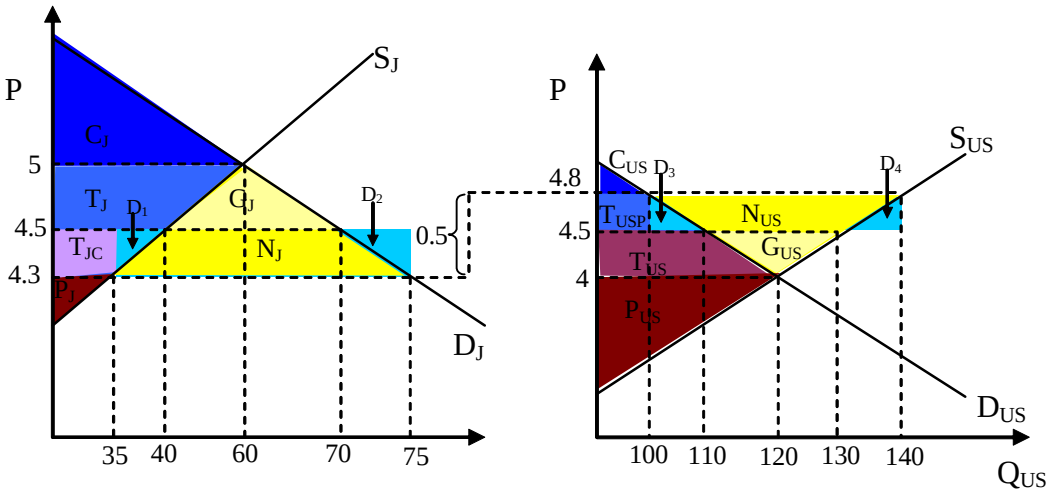


Fig. - Net welfare impact of export subsidy

You should immediately notice, that, superimposed, that N_J is *smaller* than TX_1, as TX_1 leaves two little protruding light blue triangles D_1 and D_2. Similarly, N_{US} is *smaller* than TX_2, by the amount of the two little protruding triangles D_3 and D_4. So:

$$TX_1 + TX_2 > N_J + N_{US}$$

total taxation burden of US taxpayers ($TX_1 + TX_2$) *exceeds* the global net gains from the export subsidy ($N_J + N_{US}$). In other words, on a global scale, the export subsidy is a *net welfare loss*.

How much of a net loss? By the areas of the protruding little triangles. The *deadweight loss* of the export subsidy is the sum of the areas of the four little triangles.

$$\text{Total deadweight loss from export subsidy} = D_1 + D_2 + D_3 + D_4$$

So, in sum, as a whole, the burden to US taxpayers exceeds the net global gains from it. Sheer deadweight loss. More resources are being expended than the world is reaping.

INDUSTRIAL SUBSIDIES

In general, a **subsidy** is just any handout (cash or otherwise) by the government to private firms. In the case of *export subsidies* we saw above, these handouts were tied to the amount exported. But sometimes government subsidies can be untied: they just hand the cash over to the firms, regardless of whether they sell abroad or at home. These are sometimes called **industrial subsidies**.

Industrial subsidies are *not* tied to the volume of exports, and so in principal, are not technically considered "protectionist" or "predatory". But industrial subsidies have an impact on trade, and they can be especially tailored to impact exports and imports.

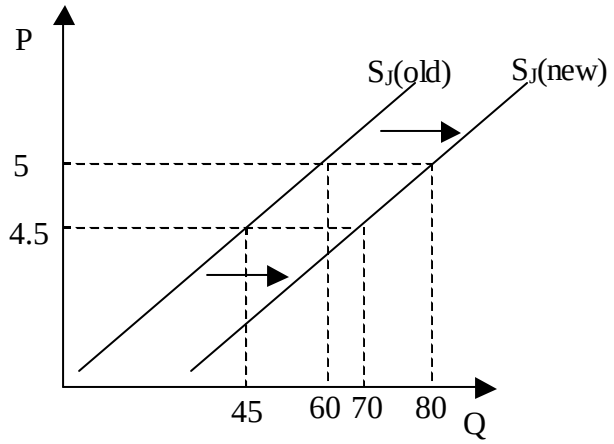
Here we shall consider two kinds of industrial subsidies that might affect trade:

-- *Import sector industry subsidies*: handouts to domestic firms which produce goods that the nation happens to be also importing.

-- *Export sector industry subsidies*: handouts to domestic firms which produce goods the nation happens to be exporting.

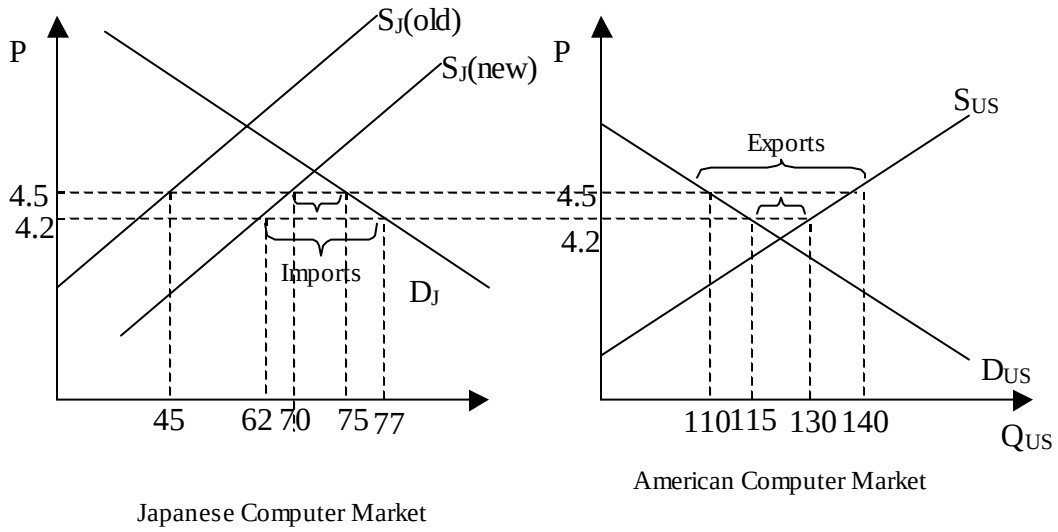
Import Sector Industry Subsidies

In our simply example, Japan is an importer of computers. Suppose it embarks on an import sector subsidization program. So the Japanese government *subsidizes* Japanese computer-makers by giving them cash handouts, that boosts their profit margins artificially. Japanese computer makers are thus able to supply *more* computers at *every* price. Diagrammatically, that is equivalent to a right-ward *shift* in the Japanese supply curve, e.g.



In the diagram, S_j(old) is the Japanese supply curve *before* the subsidy, and S_j(new) is the Japanese supply curve *after* it receives the subsidy.

How does this subsidy impact the international situation? Look at the diagram below:



As we see, at the old world price of 4.5, subsidized Japanese computer firms are now able to supply most of the computers Japan needs. Japanese demand at 4.5 is 75 computers, but with the new supply curve, Japanese producers can supply 70 -- leaving an excess of only 5 computers that need to be imported.

But at that same price of 4.5, American computers makers have a surplus of 30 computers. They can't sell these to Japan.

You can guess what happens next. Unleash the Law of Markets and prices will adjust, perhaps to something like 4.2. At this price, Japanese consumers demand 77 & Japanese producers supply 62, leaving an excess of 15 computers. At the price of 4.2, American firms will produce 130 and American consumers demand only 115, leaving an excess of 15. Thus, world market *clears* at 4.2.

So the net impact of an import sector subsidy is to *reduce* world prices and *reduce* the volume of trade.

At first glance, this doesn't seem that bad. Consumers in both countries are buying more computers at a cheaper price -- this is a good thing for them. American firms are hurt (because they sell at lower price and thus are making lower profits). Japanese firms may *seem* hurt because they *also* sell at lower price, but remember -- they have a subsidy to boost their profits.

So, on net, all that seems to have happened is that the American share of the Japanese computer market is reduced. That's why import sector industry subsidies are often called ***import-substitution*** subsidies.

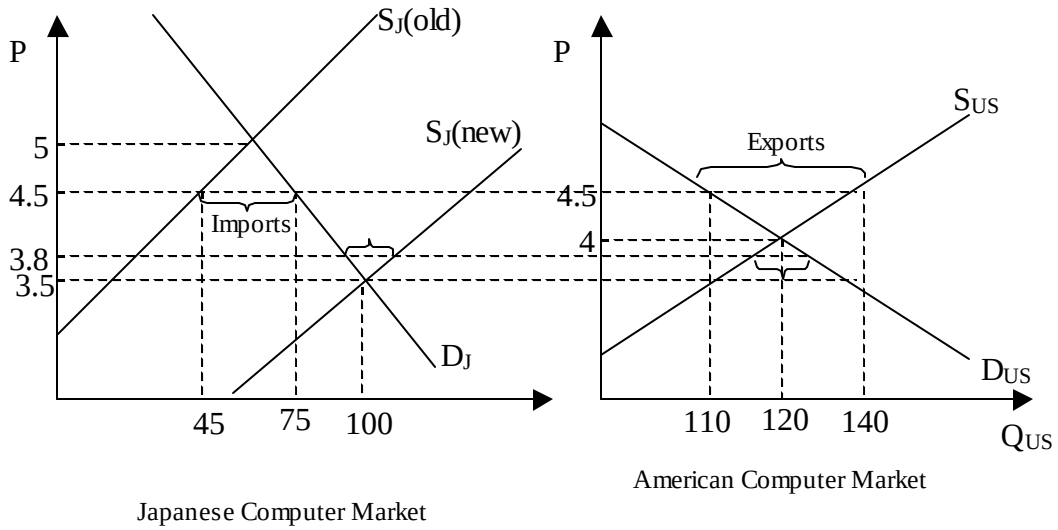
Remember the shaded triangles of "gains from trade"? Notice that with these industry subsidies, America's triangle is now very small, whereas the Japanese one is larger. So subsidies also **reallocate the gains** from trade towards the subsidizing country. This is import substitution subsidies are also called "unfair" trading practices and cause so much furor between nations.

But again there is also a very big hidden cost. Namely, the Japanese government is subsidizing Japanese firms with taxpayer money. So Japanese consumers may think they're better off because they have cheaper computers, but they also have higher tax bills. Whether they are happy with that trade-off is something that can be debated.

Comparative Advantage Reversal

Import-substitution subsidies can be used to give countries a comparative advantage in a good which they don't naturally have a comparative advantage in.

Suppose the Japanese government subsidizes computer makers so much that the new supply curve is really "out there". The net effect may very well be something like that depicted in the figure below:



What we see, is that by subsidizing so much, the Japanese government has "induced" the domestic price to fall from 5 all the way down to 3.5 in Japan. But that is *below* the American domestic price of 4! The comparative advantage of US & Japan is now *reversed*. Japanese producers should produce computers & export them to America, while American should now specialize in stereos. Unleashing the Law of Market, the "new" world price for computers would be someplace like 3.8, where Japan is now the exporter & US the importer.

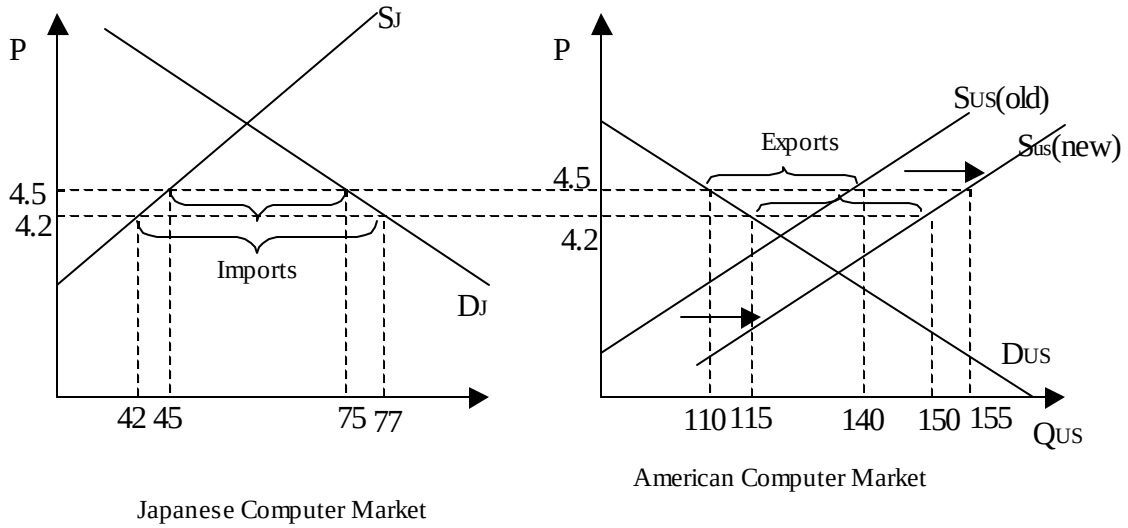
Of course, the reversal in comparative advantage will only last as long as the subsidy continues. The moment it is lifted, the old situation will impose itself.

Export Sector Industry Subsidies

Export industry subsidies (not to be confused with plain export subsidies) is simply handing out cash to firms which happen to produce the goods the nation happens to export.

These are sometimes called *export-promotion* industrial subsidies. They should not be confused with "export subsidies" dealt with earlier. Export subsidies ("bounties") tie the amount received in subsidy to the quantity sold abroad. If they sell their goods domestically, they don't receive anything. By contrast, export sector industry subsidies are just plain handouts to an industry, regardless of where they sell their output. Whether they sell abroad or at home, the firms will receive the subsidy.

Returning to our old Japanese-US computer-stereos example, the American government might offer American computer firms cash payments, regardless of whether they sell those at home or abroad. In our example, America is an exporter of computers. So, if the US government embarks on an program to subsidize computer firms, the impact would be like a rightward shift in the *American* supply curve, like the following:



Japanese Computer Market

American Computer Market

What is the impact? When American computer firms are subsidized, they can offer more computers at every price. So, at the world price of 4.5, they can offer 155 -- thereby producing a surplus of 45 = (155 - 110) that is available for export to Japan. But Japan only has a need for 30 computers. So, there is an excess of computers produced in the world.

So, unleash the Law of Markets and the price will fall from 4.5 to something like 4.2. At these lower prices, American firms produce 150 and American consumers demand more 115, leaving a surplus of 35 computers. At 4.2, Japanese consumers will demand more (77) and Japanese firms produce less (42), giving them a need to import 35 computers. So, at

4.2, markets are cleared as Japanese imports = American exports. So, with the subsidies, the volume of trade has increased from 30 to 35.

So, the *net* result of export industry subsidies is that *prices decline* and the *volume of trade increases*, the opposite of the import-substitution industry case. That seems like an eminently good thing -- except we have to remember that American taxpayers are footing the bill.

But, like the more predatory export subsidy case, export industry subsidies irritate other countries is that their domestic industry contracts. We can see this in the case above: Japanese computer makers have reduce their output from 45 to 42 computers as a result of American subsidies.

THE CURIOUS PROBLEM OF CUSTOMS UNIONS

The Neo-Liberal project of "free trade" is hard to meet in the political realities of this world. In their ideal, *every* nation should remove all tariffs, quotas and subsidies so that there are no distortions and every nation specializes in something & trades with the rest, leading to better overall efficiency in the world.

But what if that is not possible. In other words, suppose we can't get *all* countries to remove *all* trade barriers. Should we try to get *as many* countries to remove *as many* trade barriers as possible? The answer, as it turns out, may very well be "No."

To see this, look at the following example. Suppose we have three countries (US, France, Britain) each of whom produces grain. Suppose that their domestic prices (or production costs), expressed in dollars, are as follows: US produces at $20 per unit of grain, France produces at $30 per unit and Britain produces at $50 per unit.

Clearly, the US is the "most efficient" producer and should specialize in grain and export to the rest of the world (Britain & France specializing in other goods). That is what would happen if there were no trade barriers between nations.

But suppose that each country has a tariff of $35 per unit on each other's grain. In this case, the costs of American, French & British grain to consumers in the three countries are as follows:

	US	Britain	France
American grain:	20	55	55
British grain:	85	50	85
French grain:	65	65	30

As we see immediately, each will want to buy their own: Americans buy American, British buy British & French buy French. Clearly inefficient as the most efficient supplier (America) is only serving it's own market.

Now, let us suppose they *all* reduce their tariffs from $35 to $20. Now:

	US	Britain	France
American grain:	20	40	40
British grain:	70	50	70
French grain:	50	65	30

We can immediately see things have improved. The French still buy French grain, but American and British consumers will buy American grain. As the most efficient producer (US) is now serving *two* markets, the world as a whole is getting "more efficient".

But now suppose UK & France get together and form a "**customs union**" and eliminate *all* tariffs between them, but keep a common $20 tariff against outsiders. America doesn't change its policy. In this case, we now have

	US	Britain	France
American grain:	20	40	40
British grain:	70	50	50
French grain:	50	30	30

Now the British will switch from buying American grain and start buying French grain. The most efficient producer of grain (US) is now serving *less* markets (it's own) while a less efficient producer (France) is serving more markets (France & Britain). The world, as a whole, has become "less efficient".

It is common problem of customs unions, like the old German *Zollverein* set up in 1834 and the European Economic Community (EEC, now European Union) formed in 1958. There was a spate of customs unions set up in the 1990s: the North American Free Trade Agreement (NAFTA) between U.S., Canada and Mexico was set up in 1994, the Mercosur in 1995 (Brazil, Argentina, Uruguay and Paraguay) while the Andean Community (Colombia, Venezuela, Ecuador, Peru and Bolivia) went into operation in 1993. The Free Trade Area of the Americas (FTAA), still under negotiation, is supposed to merge these three.

There is also a long history of bilateral free trade agreements between countries (e.g. from the famous Anglo-Portuguese Methuen Agreement of 1703 to the recent agreements the US signed this year with Chile and Singapore). These agreements can have the same effect.

This phenomenon is known as a **trade diversion**. While customs unions & bilateral free trade agreements seem to promote the cause of free trade by lowering tariffs between countries they can also divert trade away from the most efficient world producer to a less efficient member one, which may very well make the world as a whole *less* efficient than if the trade barriers had been kept.

This is why economists often say that when the "first best" solution (no tariffs everywhere) is not available, you shouldn't automatically think the "second best" solution is to try to mimic the first one as much as possible (no tariffs between some places). If you can't go all the way, maybe you should not try to go part way.

The antidote to the trade-diversion effects customs unions is the GATT (General Agreement on Tariffs and Trade), initiated in the 1947, that morphed into the World Trade Organization (WTO) in 1995. It has tried to mitigate the effects of trade diversion by included as many

countries as possible within it (some 110 countries are currently members of WTO). WTO hosts negotiations for multi-lateral reductions in tariffs & quotas. It has also tried to establish common rules for trade & trade barriers which the direct intention of forbidding preferences for, or discrimination against, any member country (admittedly not with great success). It has also set up a dispute-settlement process where nations can bring up their grievances.

But as any agreement in GATT/WTO requires the consent of all members, progress has been quite slow. The rounds of negotiation can get quite acrimonious -- as seen recently in Seattle and Cancun. It has been unable to stop the formation of customs unions & bilateral agreements, its negotiation rounds are easily hijacked by lobbying interests from powerful nations and it hasn't quite come up with a good way to enforce decisions from the dispute-settlement process. Despite all that, it is estimated that, slowly and steadily, under the auspices of GATT & WTO, trade barriers across member nations have fallen some 40% or so since its inception.

[See "Notes on the WTO for more details"]