Parsons, 2009

How Costly is Protection?

Based primarily on Feenstra's (1992) article, but also Feenstra (2004) and Gary Hufbauer's online paper

Outline of notes:

I. Costs of US Protection
   a. Deadweight Loss (DWL)
   b. Data
   c. Quota Rents
   d. Foreign DWL

II. Costs of Protection in Japan

III. Costs of Protection in Korea

IV. Costs of Protection in China

V. Costs of Protection in the EU

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Section I: Costs of US Protection

Krugman (1990), despite being a staunch supporter of free trade, said that import restrictions in the US actually don't reduce GDP that much. This is largely because the US is very open to trade already.

While this is generally true, Feenstra (1992) feels that Krugman underestimates the costs of US protectionism.

First, before we discuss the debate, let's look at some general measures of protectionism.

The average duty of all (including agriculture) imports in the US in 2000 was 1.6% (WTO, 2001)

The average duty of industrial products in the EU in 1999 was 4.2% (WTO, 2001).

Compare this to some other countries: Japan (6.5%, in 2000), Indonesia (9.5% in 1998), Singapore (0% with only four goods having tariffs: beer, for example), Mali (22% in 1998). (All from WTO sources.)

So, yes, the US is already quite "free-trade".

Krugman's (1990) rough calculation:

Krugman estimates that import restrictions perhaps reduce US imports by 0.75% of GDP (less than one percent of GDP).

This means that if the US did NOT have these remaining barriers, the US GDP would 0.75% higher, each year.

For example, the US GDP in 2008 was $14.20 trillion. If the US was completely open, the US GDP would be: $14.31 trillion. Not very different.[1]

But he also claims that foreign countries *gain* (rents) from many of these US restrictions (particularly quotas).

As such, he estimates the foreign *gains* to be about 0.50%.

So, the *net loss* to the world, due to the US's trade restrictions is only about 0.25% of US GDP.

Why so small?

1) Because trade is only a fraction of total US GDP. (Imports were about 16% and exports about 10% of US GDP in 2005, Source: IMF)
2) Because the US is already very open to trade.

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[1] Both the Krugman and Feenstra papers are somewhat old. I use them for illustrative purposes. Many of the trade restrictions that existed then are lower or gone now. Later, we will look at more recent measures of US protection.

Also remember, this small number is only the effect of US barriers on economic activity. Most countries have levels of protection higher than the US. If we sum up all the costs from all the countries, the % of world GDP lost would be several percent of world GDP. Also, recall that this is a recurring loss every year which can never be re-couped.

Feenstra's (1992) critique, or rather "adjustment".

Feenstra feels that Krugman underestimates the costs of US protection.

He feels Krugman's estimate is too low because (main reasons):

1. Krugman's calculation ignores the addition DWL/efficiency loss to foreign exporting (non-US) countries.
2. Krugman also ignores the Terms of Trade (ToT) effect because the US is a large country. This magnifies DWL effects.
3. Tariffs are typically not levied evenly across products. This, as will be explained below, makes the DWL even larger.
4. Rent-seeking will incur additional losses

To understand these critiques, we must review and expand our basic knowledge of the partial equilibrium effects of a tariff.

Recall from our lectures in the Spring that the (domestic) costs and benefits of a tariff can be expressed as the sum of three things: the gains to the domestic producer, the loss to the consumer, and the gain in tariff revenue.

Because the loss to the consumer is larger than the other two gains, there will be a net loss for the domestic economy. This is the deadweight loss (DWL). [2]

Quotas versus a tariff[3]

The effects of an import quota are, in many ways, identical to that of a tariff.

[2] Please refer to the Krugman and Obstfeld pdf and my notes and PPT on the "Effects of a Tariff", all online on my website in my Spring Notes, first section, for a review.
[3] Please refer to the Krugman and Obstfeld pdf on my website for "quota effect" in the Fall half.

However, one important difference is that with an import quota, there is no tariff/tax revenue. So, what happens to the rectangular area called "tariff revenue" in the tariff case, when it is instead an import quota?

It depends on the way in which the import quota is administered. But often times, the "rectangle" (area "c" in the small country case, in Fig 1a below) goes to the foreign exporting firms, in the form of a "rent".

That is to say, area "C" is a 'gain' under a tariff, because it comes back to the consumer's as tax revenue. But, with a quota, some or all of the area "C" will be a transfer abroad: a pure loss for the domestic (in this case, US) country.

But, the US's loss (area "C") is the foreign countries' gain!

And according to Krugman, the largest types of protection the US are done with import quotas, not high tariffs. So, in general, he feels that much of the US's loss, becomes foreign firms' gain.

More succinctly, in terms of Fig 1a, the US consumer loses areas: A,B,C,D, but US firms gain B, and the US gains very little tariff revenue. He estimates this amount: A (US producers' gain) - A-B-C-D (US consumers' loss) to be about 0.75% of US GDP.

But, he also estimates that "C" is about 0.5%. So, US loses 0.75%, but this "C" area of 0.5% goes to foreign firms. So, in total, world welfare only falls 0.25% (0.75%-0.5%=0.25%) of US GDP due to US protectionism.

Feenstra Criticisms #1 and #2: "Ignoring exporter efficiency loss" and "US as large country"

We can combine Feenstra #1 and #2 criticisms into one set of figures (refer to Figures 1a and 1b and 2a and 2b below).

First assume that the US is a small country, as Krugman mistakenly does. [4]

[4] Of course, he does know that the US is large country; he just forgot to put that fact into his analysis.

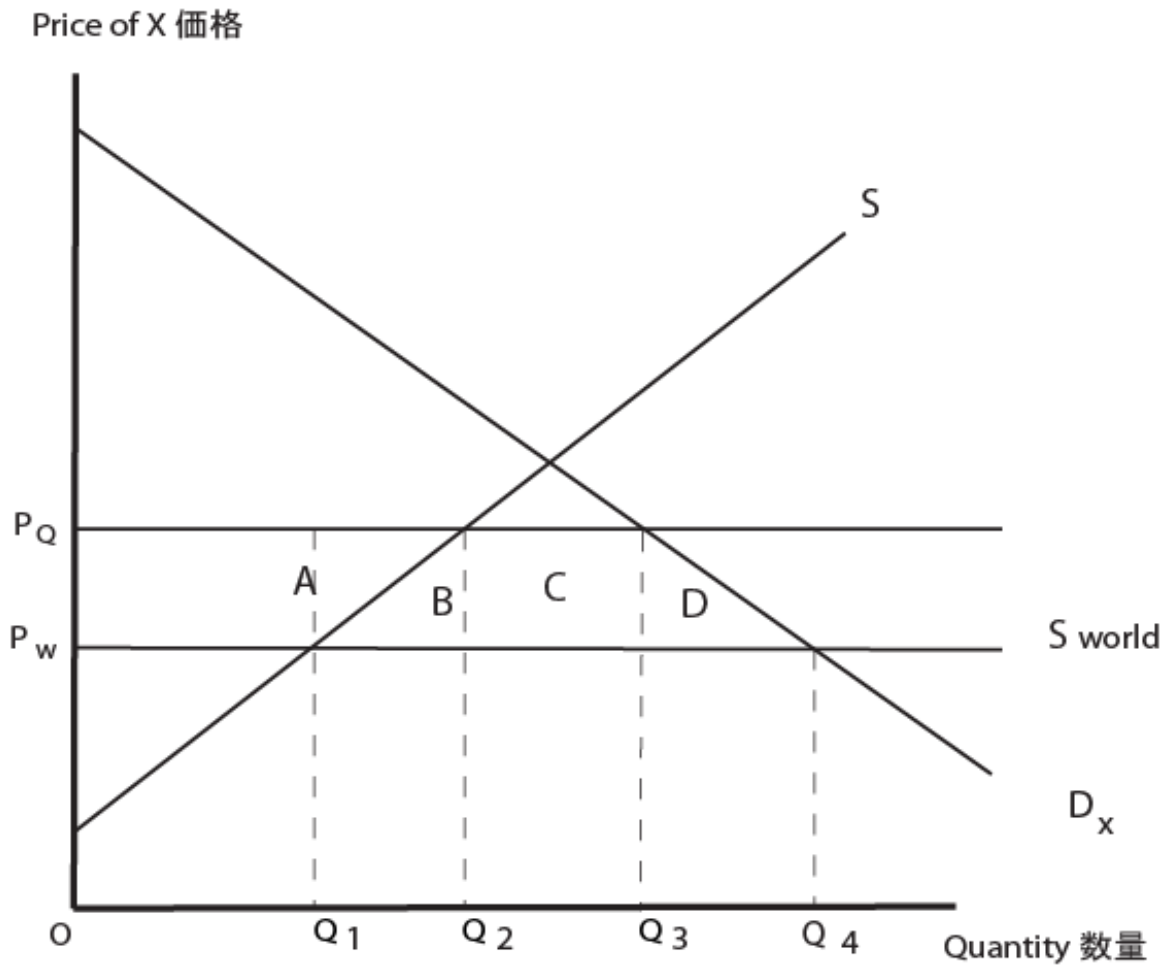

Figure 1a: Effects of a Quota on Small Country

Here, as mentioned above, the US would lose, on net, B, C, D, but C would go to the foreign exporters as rents. (The free trade volume was Q4-Q1, but the quota is set at Q3-Q2.)

We can re-write this in terms of an "import demand function", M (as opposed Dx which was the US's total demand, including domestic supply.) Basically, because the domestic area A is a transfer from US consumers to US producers, we can ignore it.

Thus, the quota figure can be re-written as Figure 1b below.

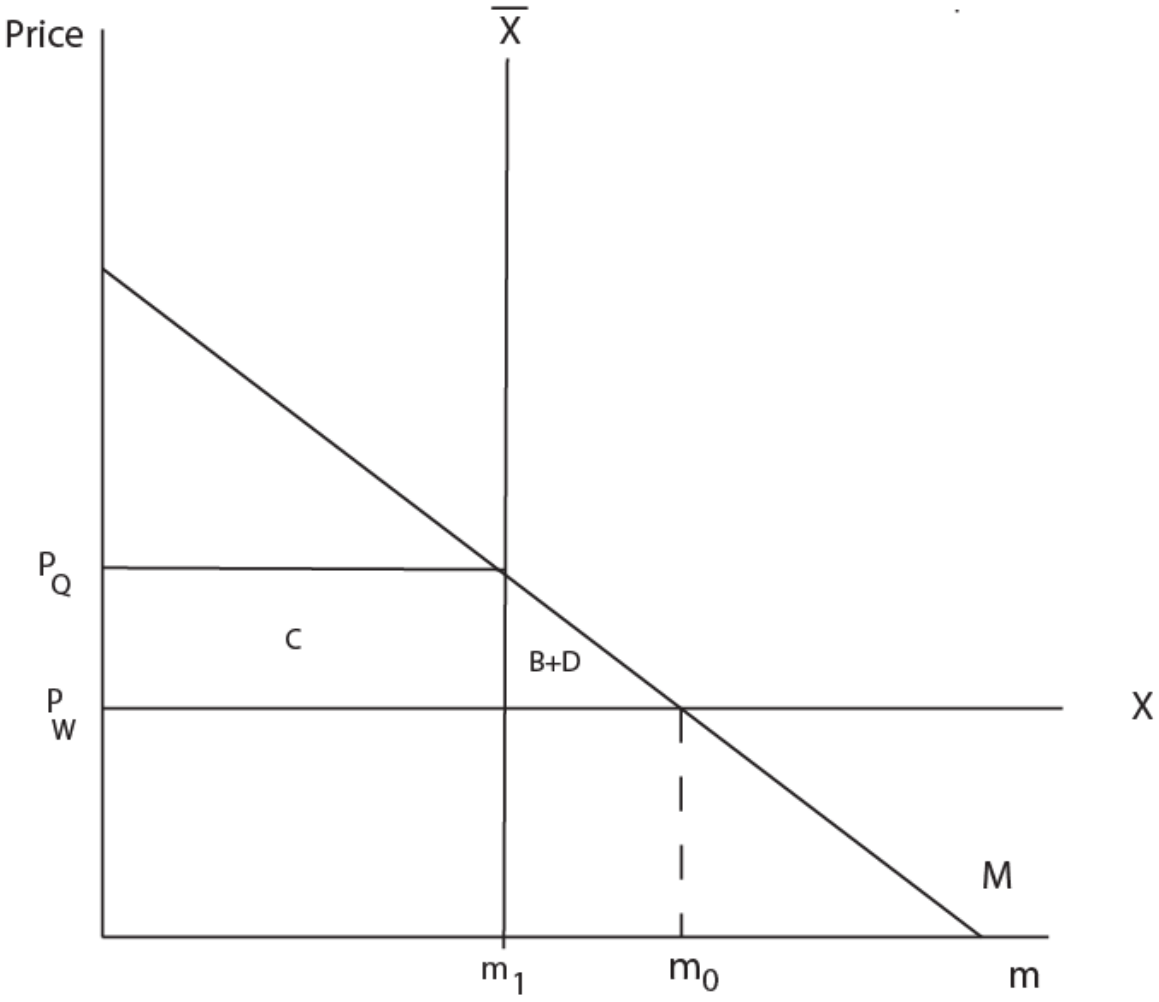

Figure 1b: Effects of Quota in Small Country with Import Demand and Export Supply Curves

Similarly, the horizontal line "X" is an export supply function. This simply means that this is the foreign country's total supply minus the amount they consume themselves. So, it is the "excess supply" or export supply of the foreign country.

$\overline{X}$ (or M1) is the amount allowed into the US by the quota.

As such, the distance from the origin to M0 is the free trade imports, (Q4-Q1 in Fig. 1a above), and the distance from the origin to M1 is the amount of the quota (Q3-Q2). (Sorry, the two figures are not of appropriate scale.)

So, we can see that if the US were a small country, the US would lose C+B+D, but C would go to the foreign exports. This is what Krugman based his analysis on.

However, in Figure 2a and 2b we can see the *addition* loss to the foreign country if the US is a large country, which affects the Terms of Trade and foreign production decisions.

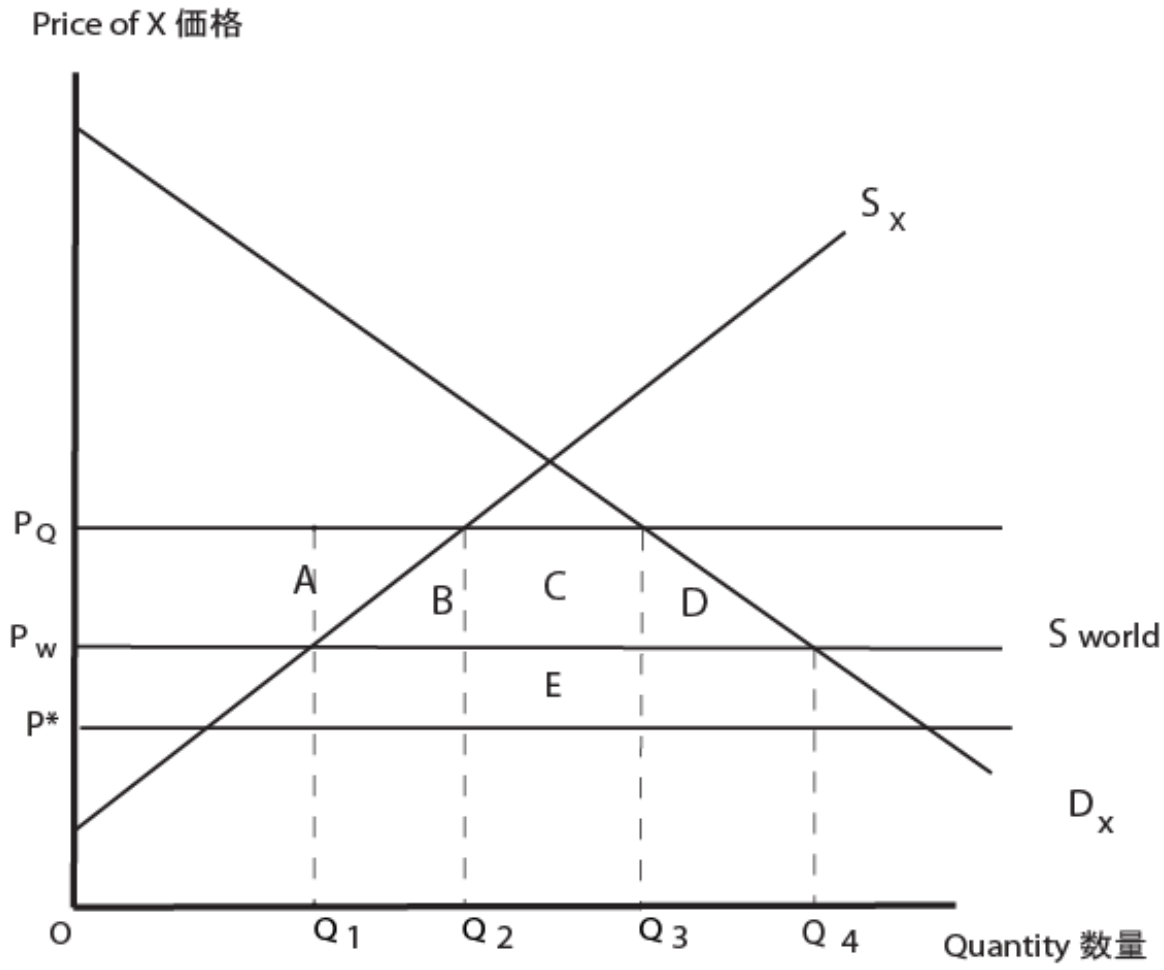

Figure 2a: Effects of a Quota on Large Country

Because the US is a large country, when it imposes quotas (or tariffs) on its own imports, it also lowers total world demand. This lowers Pw, to P*. This is an additional benefit for the US. However, it is conversely, a loss for the other country(s). This is the so-called “Terms of Trade effect” for large countries.

In the case of a tariff, the “government revenue” effect would now be C+E, not simply C. In the case of a quota, the C+E may now go to the foreigners as a rent. (This figure is identical to the one if K&O for a large country case. See the “K&O Quota” pdf for more details.)

However, to understand the effect on the foreign as well as domestic (US) market when a large importing country imposes a quota, it is useful to look at the import demand and export supply figure instead. Refer to Figure 2b below.

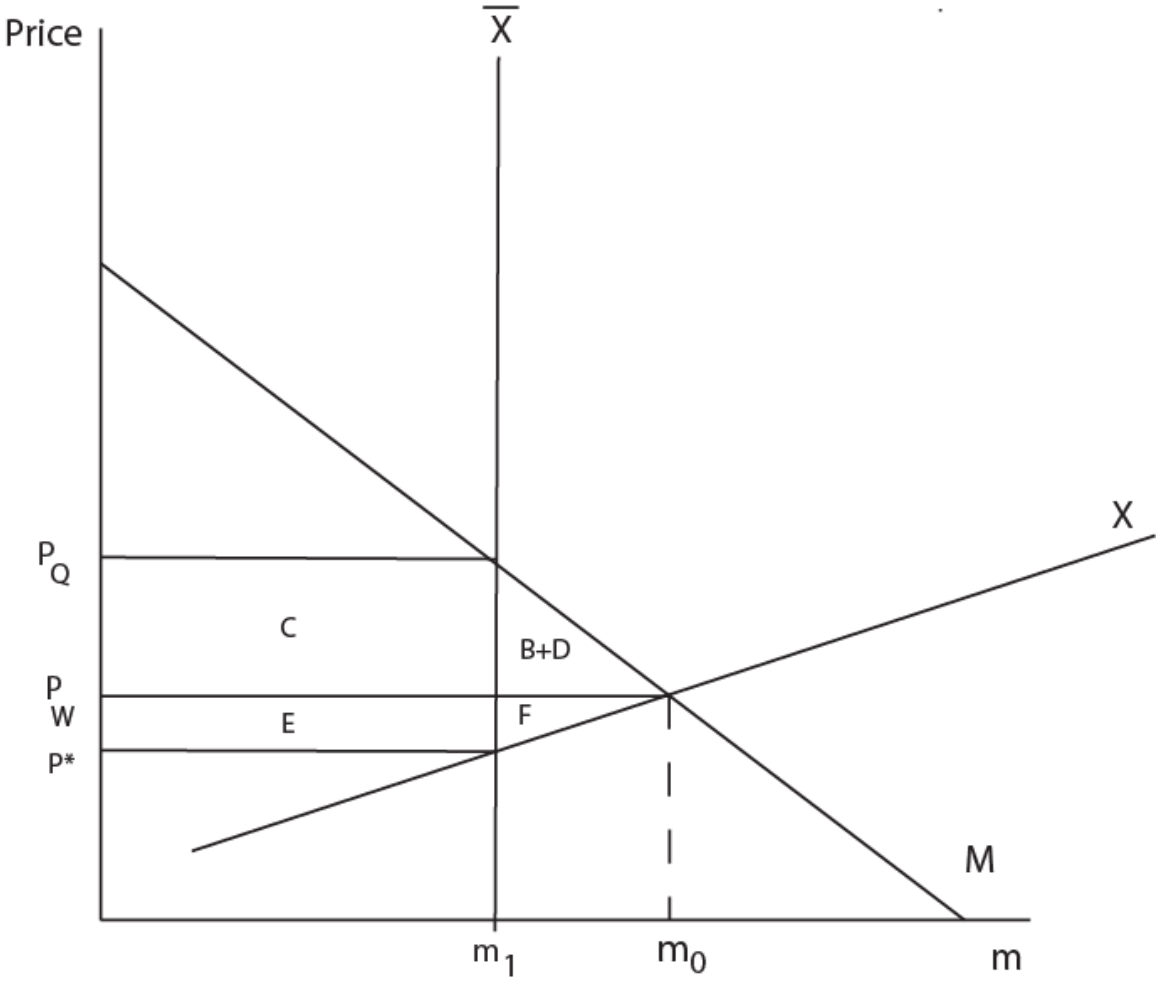

Figure 2b: Effects of Quota in ~~Small~~ Country with Import Demand and Export Supply Curves

Large!

Areas C+E (again, not to scale: sorry) are the same size and meaning as in Fig 2a. That is, C+E represents a transfer from US to Foreign. B+D is the same deadweight loss for the US as in 2a as well.

However, because the import quotas obviously reduce exports from Foreign to the US, there is an additional loss. This loss to foreign producers is area E+F.

So, for the Foreign producers, the gain is (C+E) – (E+F), or simple C-F. If C is less than F, Foreign could also have a net loss.

For world welfare the net loss is (B+D) (US's loss) plus F, the Foreign country's net loss.

Thus, the true loss from the US Quotas on world welfare is B+D+F.

Feenstra summarizes the calculation of several studies and estimates that "F" is about as big as B+D.

So, now, Krugman's "0.25%" becomes 0.50%.

Recall originally, we had 0.75% (B+D+C), but Krugman argued that "C" was about 0.50%, so world welfare lost about 0.25%.

Now, Feenstra is saying that his new "F" is about as large as B+D, or about 0.25%. So, B+D+F=0.25%+0.25%=0.50. Or about double what Krugman estimated.

But Feenstra has several other reasons why he thinks the costs of protection, even for a very open country like the US, are still much larger.

The actual estimates, in US$ of the various costs and benefits are:

* US losses from various quotas and tariffs (B+D): $8 to $12 billion (1985)
* US losses that transfer to Foreign (C, or C+E): $7 to $17 billion
* Foreign DWL (F): $4 to $19 billion

(See Feenstra paper or book for more details)

Feenstra's Criticism #3: "Tariffs are typically not levied evenly"

Recall from my Spring notes "Notes" Costs of Protection…" that the higher the tariff, the larger the distortion and thus the larger the DWL.
関税が高ければ、高いほど効率性の損失が大きくなる。

In more concrete terms, if we double（２倍）the tariff, from, for example, 10% to 20%, the DWL will increase four-fold (４倍)

So, when considering the deadweight loss from the US relatively low tariffs (about 2% *on average*) we must remember that they are an average of high tariffs and low tariffs.

Again, to put it more concretely, suppose you had two tariffs, one on apples (2%) and one on bananas (also 2%.) And suppose you calculated US DWL for these two tariffs to be: $10 million DWL due to apple tariff and $10 million due to the banana tariff. So, the total DWL would be $10+$10 or $20 million dollars, and the average tariff level would be 2%+2%/2=2%, of course.

But, what if, instead, the tariffs were: Apples (0%) and Bananas (4%)?

This would also produce an average tariff level of 2% [(0%+4%)/2=2%], but the DWL would be much greater.

In fact the DWL would be:

DWL Apples: $0
DWL Bananas: $40
Total DWL =$40

From the geometry of partial equilibrium we can easily see why *doubling* the tariff on bananas (from 2% to 4%) *quadruples* the DWL.

Refer to Figure 3 below. With the "low" tariff, the DWL is the sum of the two RED triangles. With the "high" tariff, which is drawn exactly twice as large as the "low" tariff, the DWL will be the total of both RED and GREEN areas. By simple geometry, it is easy to see that the DWL from the "high" tariff will be quadruple (four times) the size of the "low" tariff.

If we had four goods, three of which were duty-free, and one which was not, we might have: Apples (0%), TVs (0%), Cars (0%), and Bananas (8%). This would also produce an *average* tariff level of 2%, but the DWL (on Bananas) would be much higher than if there was simply a 2% tariff on all US imports.

This is why the estimates Feenstra provides on the effect of the US's average tariffs must also be adjusted upward.

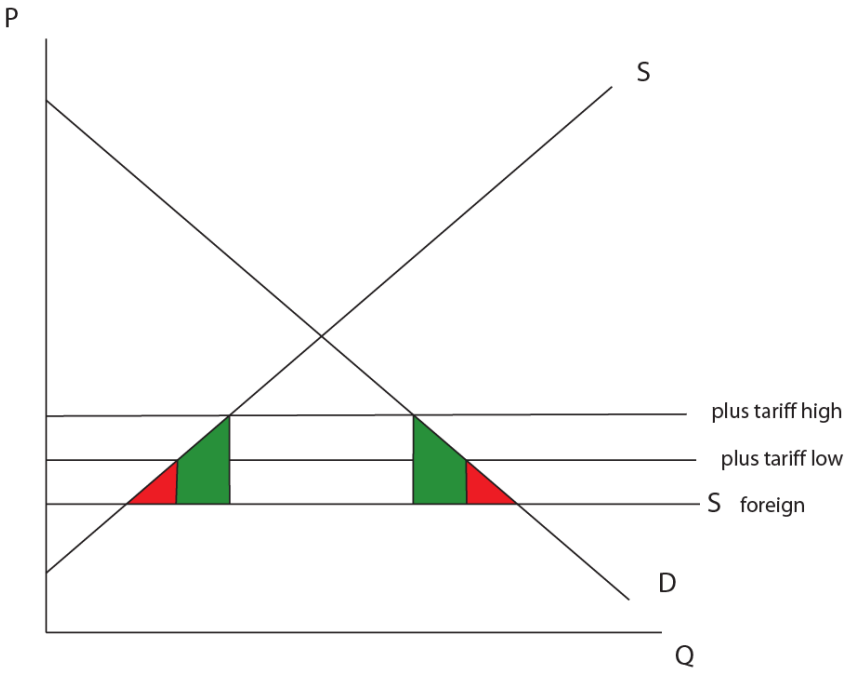

Figure 3: When the tariff doubles, DWL quadruples

Feenstra's Criticism #4: Rent-seeking

Feenstra also notes that the existence of tariffs, and moreover, of import quotas introducing the very likely possibility of wasteful, rent-seeking behavior. (Recall rent-seeking notes from Spring semester). This will, of course, increase the costs of protectionism even further.

Section II: Costs of Protection in Japan

Feenstra's paper is based on several studies summarized by Hufbauer. In sum, the Hufbauer paper finds that the consumer cost to the US protectionism (areas A+B+C+D) is 1.2% of US GDP.

How does this compare to studies of other countries?

A famous study by Sazanami, Urata and Kawai (1995) uses 1989 Japanese data. They find that the costs of protection in Japan are 2.6% to 3.8% of Japanese GDP. This is much higher than the case of the US, mainly because agriculture is far more protected in Japan.

Section III: Costs of Protection in Korea

A study by Kim (1996) summarized in the Hufbauer cite finds (using 1990 data) that the costs of (Korean) protectionism for Korean consumers is 3.8% to 4.3%, a little higher than in Japan.

Section IV: Costs of Protection in EU

A study by Messerlin and Owen (1996), using 1990 data, summarized in the Hufbauer cite finds that the costs of EU protectionism for EU consumers is 1.1% to 1.6%, a little higher than in the US.

Section V: Costs of Protectionism in China

A study by Messerlin and Owen (1996), using 1994 data (before China entered the WTO and liberalized considerably), summarized in the Hufbauer cite finds that the costs of Chinese protectionism for Chinese consumers is 6.2%.

In general, Less Developed Countries (LDCs) have higher tariffs and other trade restrictions than developed countries. Thus, the gains from trade, and the gains from the current Doha round, when completed, will be far greater for the LDCs.

Main references

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