

A Reexamination of the Partial Competitive Equilibrium Analysis of

Export Subsidies¹

by

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Abstract

This paper re-examines the standard partial competitive equilibrium analysis of an export subsidy. In the conventional analysis the price of the good in the country imposing an export subsidy will exceed the world price by the amount of that subsidy. However, that analysis either ignores the fact that in such a situation foreign producers will want to sell their output in the country with the subsidy rather than on the world market or implicitly assumes that something prevents this possibility from happening. This paper examines the possible kinds of partial competitive equilibria that can arise in a market when there is no barrier to prevent foreign firms from selling in a market with a price above the world price. In this paper the only trade distortion is due to export subsidy of one country. It is shown that in such a situation there are 3 types of possible equilibria: one where the price in the country with the subsidy differs from the world price by the amount of the subsidy, one where this difference is strictly positive but less than the amount of the subsidy, and one where the two prices are equal. A characterization of which type of equilibrium will occur for a given set of usual demand and supply curves is given. Furthermore, a simple demand and supply curve example is presented showing that it is possible that an export subsidy by a large country can increase that country's net welfare.

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This paper examines the standard textbook (such as Asheghian [1], Feenstra [3], Pugel [4], and Salvatore [5]) partial competitive equilibrium analysis of an export subsidy. The usual analysis argues that an export subsidy creates a wedge between the domestic price and the world price of a good. However, this requires additional assumptions that are usually not explicitly stated. For example, as mentioned in [4], domestic consumers must not be able to buy the good at the lower world price. However, in the small-country case, it must also be the case that foreign producers are somehow prevented from selling their output in the country imposing the export subsidy. This is necessary if the price in that country is higher than in the rest of the world. If this is true then foreign producers would want to sell their output only in the higher priced market. Therefore the usual analysis is of an export subsidy in combination with some restriction preventing the importation of the subsidized good. This paper analyzes a situation where an export subsidy is the only deviation from free trade and foreign producers are free to sell their output in any market.

It is shown that the usual equilibrium where the domestic price is higher than the world price by the amount of the export subsidy is not the only possible equilibrium in such a situation. In the large-country case there are 3 types of equilibria: the usual one, one where the domestic price is higher than the world price but by less than the amount of the subsidy, and one where the world price equals the domestic price. Which equilibrium occurs depends on the relative size of the foreign supply and the domestic demand. This paper provides a characterization of when each type of equilibrium occurs.

Furthermore, an example is presented showing that it is possible that an

export subsidy by a large country can increase domestic net welfare using a standard partial competitive equilibrium demand and supply model. In [3], Feenstra states that this has previously only been shown in models with more than 2 goods or a noncompetitive market structure. For example, in [2], Feenstra shows that an export subsidy can improve net welfare in the country imposing an export subsidy if there are three commodities. His analysis uses a differential approach (i.e. a “small” subsidy is imposed) starting at a free-trade equilibrium with net export supply functions. Such an approach implicitly assumes that the export subsidy does not change where a country’s producers sell their output. Output just moves along the given export supply functions. Of course, this is a reasonable when considering small subsidies.

The example presented below is different in that it examines a discrete subsidy and assumes firms will sell in whichever market has the higher (net) price. In fact, the non-subsidy equilibrium that the example starts with has the property that the country imposing the export subsidy is a net importer of the good. The export subsidy causes its producers to export their output instead of selling it in the domestic market. This is because the equilibrium with the export subsidy has the property that the domestic (consumer) price is equal to the world price. So, with the subsidy, domestic producers receive more by exporting their output than by selling it in the domestic market. Note that this is not possible using the approach used in [2].

The model used in this paper is a standard textbook perfectly competitive partial equilibrium model focusing on a single homogeneous commodity. The country that imposes a per unit export subsidy on this good will be denoted by the subscript h . The amount of this subsidy is denoted s . The market for

this good will be referred to as the “domestic market”. There is also a foreign or world market consisting of the rest of the world. The price in this market will be called the “world price” or the “foreign price”. Demand and supply curves in the foreign market will be denoted with the subscript f . There will be zero transportation costs and free trade except for the export subsidy. In particular, all (foreign and domestic) producers will sell their output in the market with the higher (net) price. The only barrier to free trade in this model is the export subsidy.

In section 1, it is argued that in a small country the domestic price can never be higher than the world price when the export subsidy is the only barrier to free trade. The large-country case is discussed in section 2, which gives examples of each of the 3 different types of possible equilibria. Section 3 provides a characterization of when each of these 3 possible types of equilibrium occurs. The example showing that a large country might be able to increase its domestic net welfare with an export subsidy is in section 4. Section 5 presents some concluding remarks.

1 Small-country Case

The usual analysis of the small-country case is given in Figure 1. S_h and D_h represent the supply and demand functions in the nation imposing the export subsidy on this good. P_w indicates the (free-trade) world price and s is the amount of the export subsidy per unit. A small country is defined to have no effect on the free-trade world price.

If a small country now imposes an export subsidy of s per unit then its producers will no longer sell on the domestic market unless the domestic

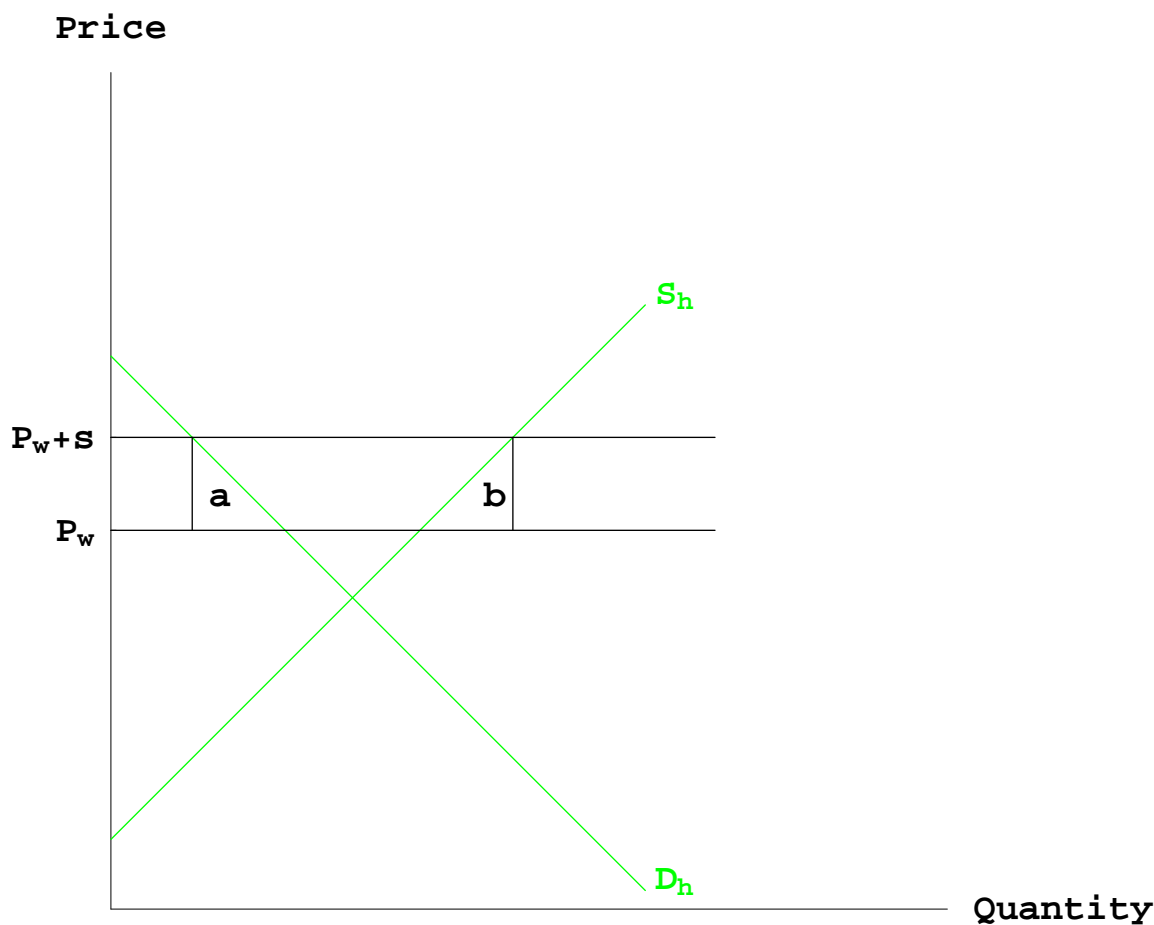


Figure 1: Usual small-country analysis of an export subsidy.

price of the good rises to $P_w + s$, while the world price remains at P_w . In the usual textbook analysis, this is what is assumed to happen. Then domestic consumption would fall and domestic output would rise, with a corresponding increase in net exports. The net welfare loss of such a policy is then given as the sum of the areas of the triangular regions a and b in Figure 1.

If there are no other barriers to trade and the domestic price of this good exceeds the world price then where will the foreign producers want to

sell their output? Of course, they will want to sell their entire output in the market with the higher price. Since this market is assumed to be small, these foreign producers can more than satisfy the demand in the small-country market. Therefore, a small country having a higher price than the rest of the world is not an equilibrium. The usual analysis ignores these incentives of the foreign producers or is implicitly assuming that there is another trade barrier preventing foreign producers from selling in that market.

Therefore, a small-country export subsidy should leave the domestic price unchanged and equal to the world price. If the domestic price equals the world price then domestic producers will not want to sell their output in the domestic market. So, all of the domestic output will be exported and all of the domestic consumption must be satisfied by imports from foreign producers. Domestic consumers are therefore unaffected by this export subsidy, unlike in the usual analysis described earlier. In this case, the net welfare loss will just be area b .

In this case, a small-country export subsidy will have the same effect as a production subsidy of the same amount. Another way to see that this must be true is to notice that if the domestic price equals the world price then domestic producers will only sell their output in the foreign market, which entitles them to receive the export subsidy. Therefore all of their production receives the export subsidy since all production is exported. The only difference between this and a production subsidy is that with a production subsidy domestic producers are willing to sell their output in the domestic market.

2 Large-country Case

2.1 Usual analysis

Next, the large-country case is examined. A large country can influence prices. In the usual partial equilibrium models, this is modeled using an upward-sloping world supply curve. A free-trade domestic market equilibrium is described in Figure 2. As before, S_h and D_h represent the domestic supply and demand, respectively. S_f is the supply function of foreign (rest of the world) producers. The world free-trade equilibrium price is now, P_w , which is the price at which world supply, $S_h(P) + S_f(P)$, equals world demand, $D_h(P) + D_f(P)$.

Note that in this paper the demand and supply curves of both the domestic and foreign markets are presented on the same graph. This is not how this is usually done. The analysis is usually presented as in [3] with one graph for the domestic market and another for the “export market”. However, since the characterization of the different types of equilibria depends on the relationship between the domestic demand and foreign supply, it is more convenient to draw all demand and supply curves on the same graph.

The export subsidy can be described as shifting S_h downward by the amount of the subsidy. This will shift the world supply curve and lower the world equilibrium price. The usual analysis then argues that the domestic price must be higher than this world price by the amount of the subsidy. As before, the reasoning is that domestic producers will not sell in the domestic market unless the price they receive is the same as the price they receive by exporting, which is the world price plus the subsidy. This will be an

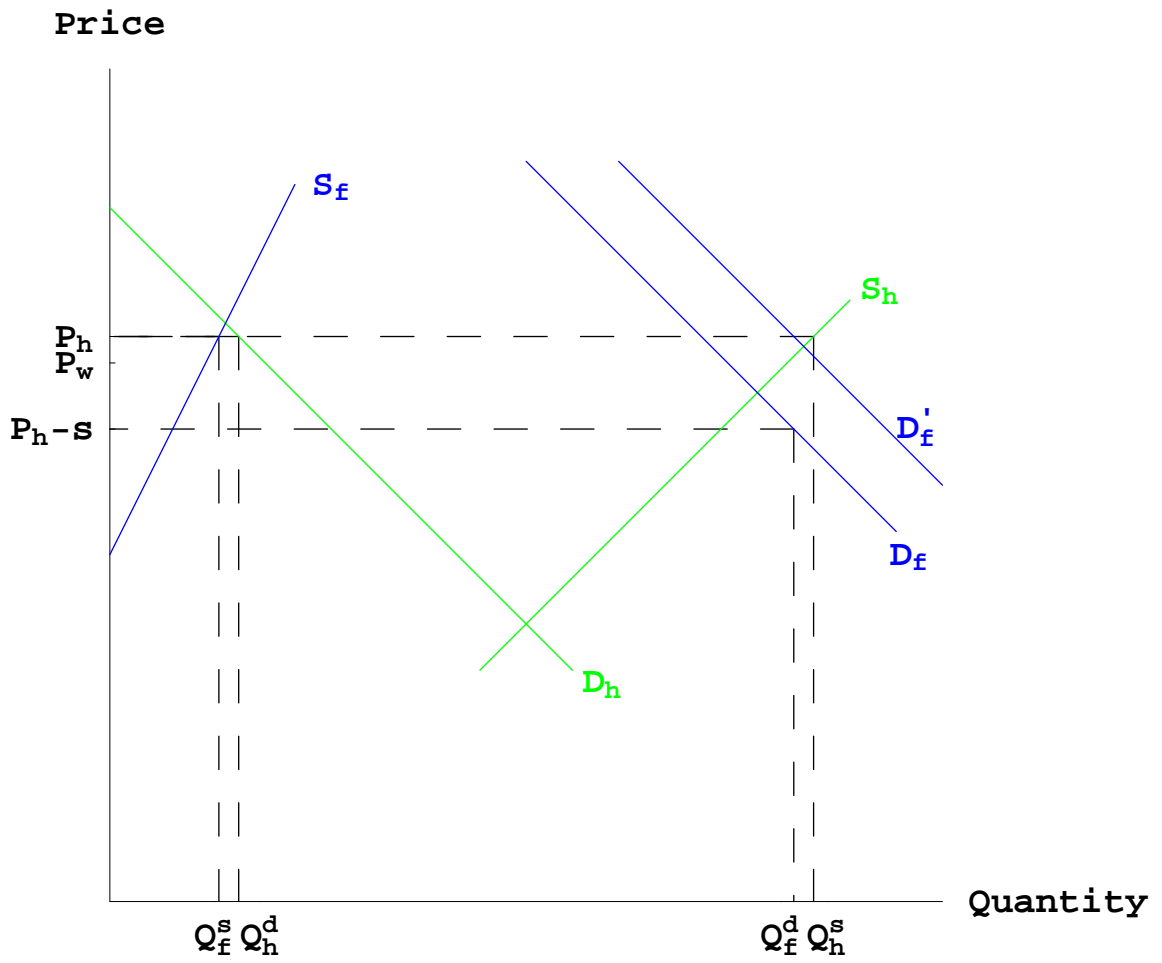


Figure 2: Usual large-country free-trade equilibrium.

equilibrium if the foreign supply is less than the domestic demand at the new equilibrium domestic price. The difference will be provided by domestic producers. Such a situation is shown in Figure 2, where P_h is the domestic price and $P_h - s$ is the world price.

The equilibrium described in Figure 2 can be characterized by the following conditions.

$$S_f(P_h) + S_h(P_h) = D_h(P_h) + D_f(P_h - s) \quad (1)$$

$$P_w = P_h - s \quad (2)$$

$$S_f(P_h) \leq D_h(P_h) \quad (3)$$

Equation 1 is just the statement that world supply equals world demand when the domestic price is P_h . Note that P_h is the price received by all producers. Foreign producers will only sell on the domestic market and so receive P_h . Domestic producers receive P_h if they sell to the domestic market and they receive $P_h - s$ plus the subsidy, s , if they sell on the world market. Also, when P_h is the domestic price, the world price is $P_h - s$, which is equation 2. At this price the foreign quantity demanded is $D_f(P_h - s)$. In Figure 2, equation 1 means that $Q_f^s + Q_h^s = Q_f^d + Q_h^d$.

Equation 3 says that the foreign supply is less than or equal to domestic demand at P_h . This is needed since foreign producers will only sell in the domestic market. If their output was greater than the domestic quantity demanded then the domestic price would have to be lower in order to clear the domestic market. However, if the domestic price is lower then domestic producers would no longer be willing to sell in the domestic market. Therefore $S_h(P_h)$ would not represent the output of domestic producers. Instead,

world supply would be given by $S_f(P_h) + S_h(P_f + s)$ and world demand by $D_h(P_h) + D_f(P_f)$.

The usual analysis does not explicitly consider equation 3. However, if it is not satisfied then an equilibrium in which the domestic price is higher than the world price by the amount of the export subsidy is not possible, unless there is some restriction that prevents foreign producers from selling as much as they want in the domestic market. When equation 3 is not satisfied then there are other types of equilibria, which are described in the next subsection.

2.2 Other Types of Equilibrium

2.2.1 Domestic price higher by less than the subsidy

Figure 3 shows an equilibrium where the domestic price, P_h , is greater than the foreign price, P_f , but the difference is strictly less than the export subsidy, s . In such an equilibrium, foreign producers will only sell in the domestic market, since its price is higher, and domestic producers will only sell in the foreign market, since the foreign price plus the subsidy exceeds the domestic price. Such an equilibrium is characterized by the conditions.

$$S_f(P_h) = D_h(P_h) \tag{4}$$

$$S_h(P_f + s) = D_f(P_f) \tag{5}$$

Equations 4 and 5 just say that demand equals supply in each market. When the domestic price is less than the world price plus the amount of the subsidy then the supply in the domestic market is composed entirely of foreign producers and the supply in the foreign market is composed entirely of domestic producers.

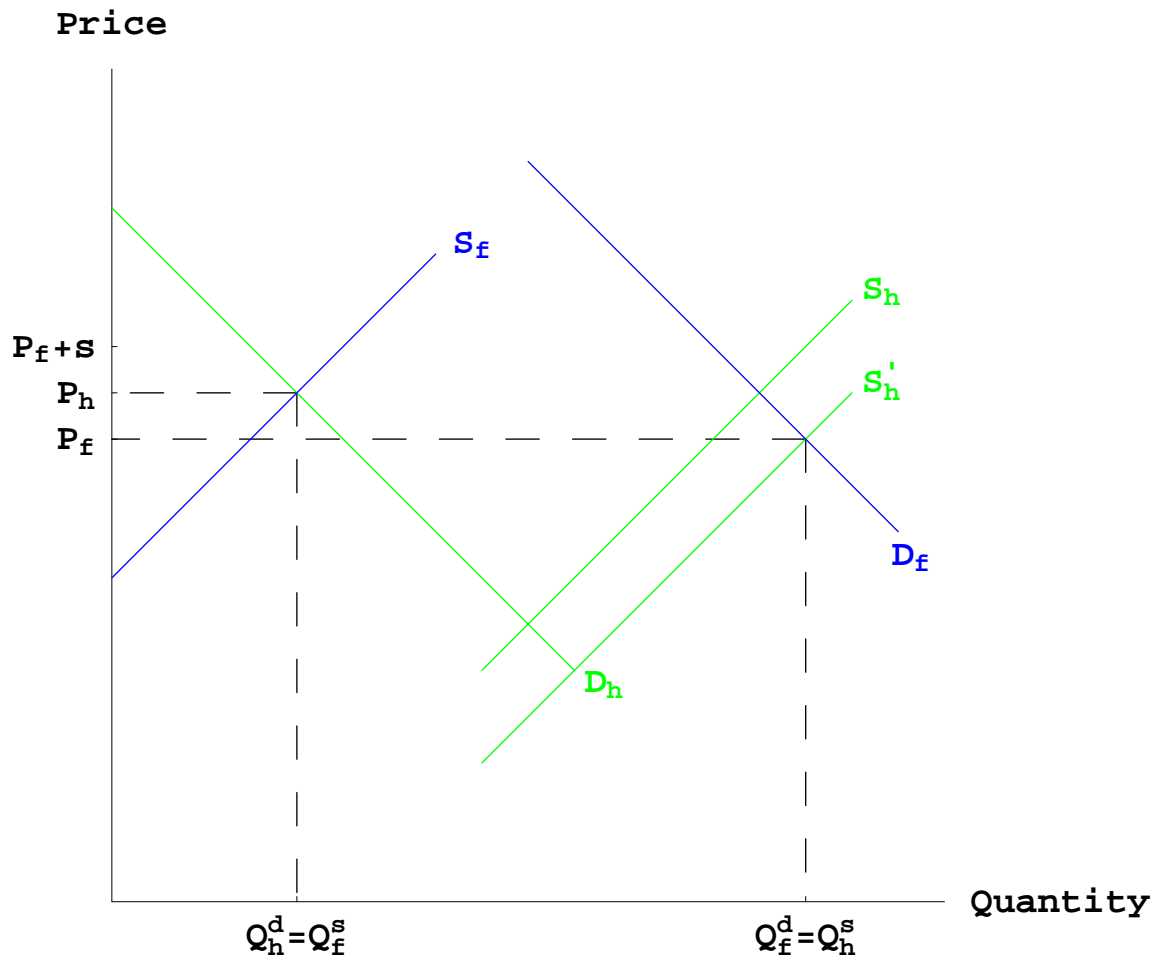


Figure 3: Large-country with export subsidy. Domestic market price is higher than the world price, but by less than the amount of the subsidy.

Note that in this case, if the domestic price is higher than the indicated P_h then there is excess supply in the domestic market. Therefore, there cannot be an equilibrium with a domestic price higher than the indicated P_h . On the other hand, if the world price is less than P_f then there is excess demand on the foreign market. So there will be no equilibrium in which the world price is less than the indicated P_f . This shows that this is the only equilibrium with the given demand and supply curves.

In such equilibria it is also possible for the export subsidy to reduce the domestic price below the no-subsidy free-trade world price. This is true in Figure 3 since the price where $S_h(P) = D_f(P)$ is higher than P_h . This implies that the free-trade price P_w defined by $S_f(P_w) + S_h(P_w) = D_h(P_w) + D_f(P_w)$ is higher than P_h . In such a case, both the domestic producer surplus and the domestic consumer surplus would be increased by the export subsidy. However, these gains would be less than the cost of the subsidy. Note that in this type of equilibrium the entire domestic output is exported and therefore receives the subsidy.

2.2.2 Domestic price equal to the foreign price

When the foreign supply is large enough then a third type of equilibrium exists. If the foreign supply exceeds the domestic demand at the equilibrium domestic price then, in order for this to be an equilibrium, the domestic price must equal the foreign price. This must be true in order for foreign producers to have an incentive to sell some of their output in the foreign market. In addition, the domestic supply (which will be sold only on the foreign market) must be less than the foreign demand. In this case, the equilibrium price,

P , which will be less than the free-trade price, will be characterized by the following conditions.

$$S_f(P) + S_h(P + s) = D_f(P) + D_h(P) \quad (6)$$

$$S_f(P) \geq D_h(P) \quad (7)$$

$$S_h(P + s) \leq D_f(P) \quad (8)$$

Equation 6 says that world supply equals world demand. When the domestic price and the world price are both equal to P , domestic producers will only export and their output will be $S_h(P + s)$. Since only foreign producers will sell to the domestic market, equation 7 guarantees that the output of these producers is sufficient to meet the domestic demand. Equation 8 requires that the output of domestic producers is less than or equal to the foreign demand. Since all of the domestic output will be sold on the foreign market, this condition is necessary to guarantee that the foreign market clears.

An example of such an equilibrium is given in Figure 4. Equation 6 implies that the differences between demand and supply due to equations 7 and 8 are equal. On the graph, these differences are $Q_f^s - Q_h^d$ and $Q_f^d - Q_h^s$, respectively. This amount is what foreign producers will sell in the foreign market. It is possible for this amount to be zero, in which case the equilibrium is like the previous type where foreign producers supply all of the domestic demand and domestic producers supply all of the foreign demand. However, in this case the prices in the two markets are identical.

With the demand and supply curves in Figure 4, there is no equilibrium with the domestic price higher than the world price by the amount of the

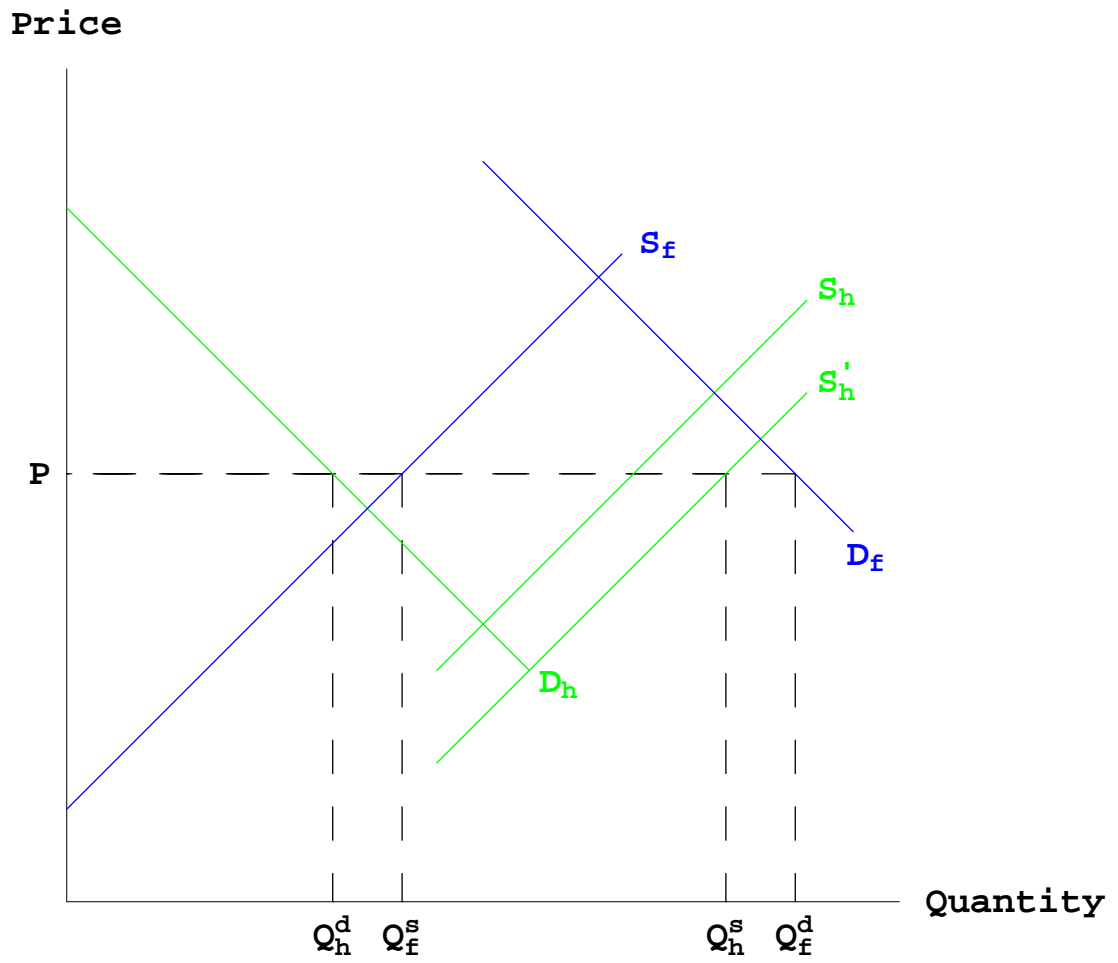


Figure 4: Large-country with export subsidy. Domestic market and world price are the same in equilibrium.

subsidy. This is for similar reasons as why the example in Figure 3 does not have such an equilibrium. If the domestic price is higher than the indicated P then there is excess supply in the domestic market. Therefore, there cannot be an equilibrium with a domestic price higher than the indicated P . On the other hand, if the world price is less than P then there is excess demand on the foreign market. So there will be no equilibrium in which the world price is less than the indicated P .

Finally, notice that in this case the equilibrium price P will be below the no-subsidy free-trade world price. This is obvious since the subsidy increases the domestic supply. Therefore, the subsidy increases both domestic consumer surplus and producer surplus. Although this gain is less than the cost of the export subsidy. As in the previous type of equilibrium, all of the domestic output is exported.

3 Characterization of when each type of equilibrium occurs

This section describes when each type of equilibrium occurs. The examples in Figures 2-4 differ only in the supply curve of foreign producers. The key property is the relationship between the price at which the foreign supply intersects the domestic demand and the price where the domestic supply equals the foreign demand. The following result is proved.

Proposition: Let the foreign supply curve, $S_f(P)$, and the domestic supply curve, $S_h(P)$, be continuous and increasing. Let the foreign demand curve, $D_f(P)$, and the domestic demand curve, $D_h(P)$, be continuous and

decreasing. Let the quantity supplied at $P = 0$ be strictly greater than the quantity demanded for each demand and supply curve. Let the quantity demanded at some strictly positive price be greater than quantity supplied for each demand and supply curve. Furthermore, define P_{fh} as the price that equates foreign demand with domestic supply given a subsidy of s per unit, i.e. $D_f(P_{fh}) = S_h(P_{fh} + s)$. Given these assumptions, if P_{hf} is the price where $D_h(P_{hf}) = S_f(P_{hf})$ then the following are true.

1. $P_{hf} > P_{fh} + s$ implies that the only equilibrium is where the domestic price is equal to the foreign price plus the amount of the subsidy. Furthermore, the equilibrium domestic price will be between $P_{fh} + s$ and P_{hf} and will be above the no-subsidy free-trade price. In such equilibria, domestic producers can sell in either market while foreign producers will sell only in the domestic market.
2. $P_{fh} + s \geq P_{hf} > P_{fh}$ implies that the only equilibrium is where the domestic price equals P_{hf} and the foreign price equals P_{fh} . In such an equilibrium, domestic producers will only sell in the foreign market and foreign producers will sell only in the domestic market. Also, the new domestic price can be either above or below the no-subsidy free-trade price.
3. $P_{fh} \geq P_{hf}$ implies that the only equilibrium is where the domestic and foreign market prices are equal. Furthermore, this equilibrium price will be between P_{hf} and P_{fh} and less than the no-subsidy free-trade price. In such an equilibrium, domestic producers will only sell in the foreign market and foreign producers can sell in either market.

Proof: The proof proceeds by examining each of the three cases. In each case the equilibrium price(s) must clear the world market. How this condition is written will depend on the case. This is because the relationship between the equilibrium domestic price and equilibrium world price will determine where the producers want to sell their output.

Figure 5 shows three foreign supply curves, S_1 , S_2 , and S_3 , that correspond to the three cases of this proposition. Note that in each case this figure shows that the country imposing the export subsidy has a comparative advantage in this good, i.e. its autarky price is less than the autarky foreign market price. This is the usual situation where the country imposing an export subsidy is an exporter of the good. However, nothing in the proof of this proposition relies on this. It is also valid if a country importing a good under free trade imposes an export subsidy that turns it into a net exporter of that good.

Case 1: $P_{hf} > P_{fh} + s$

First, an equilibrium where $P_h = P_f + s$ will be found. If prices satisfy this equality then P_h is the net price received by both domestic and foreign producers. Therefore world supply can be written as $S(P_h) = S_h(P_h) + S_f(P_h)$ and world demand can be written as $D(P_h) = D_h(P_h) + D_f(P_h - s)$, since the foreign price will be lower than the domestic price by the amount of the subsidy. Note that $D_f(P_h - s)$ is represented on the graphs by D'_f .

By the definitions of P_{hf} , P_{fh} and their relationship in this case we have $S(P_{hf}) > D(P_{hf})$ [since $S_f = D_h$ and $S_h > D'_f$ at this price] and $S(P_{fh} + s) < D(P_{fh} + s)$ [since $S_f < D_h$ and $S_h = D'_f$ at this price]. Therefore the standard assumptions on demand and supply guarantee that there is a

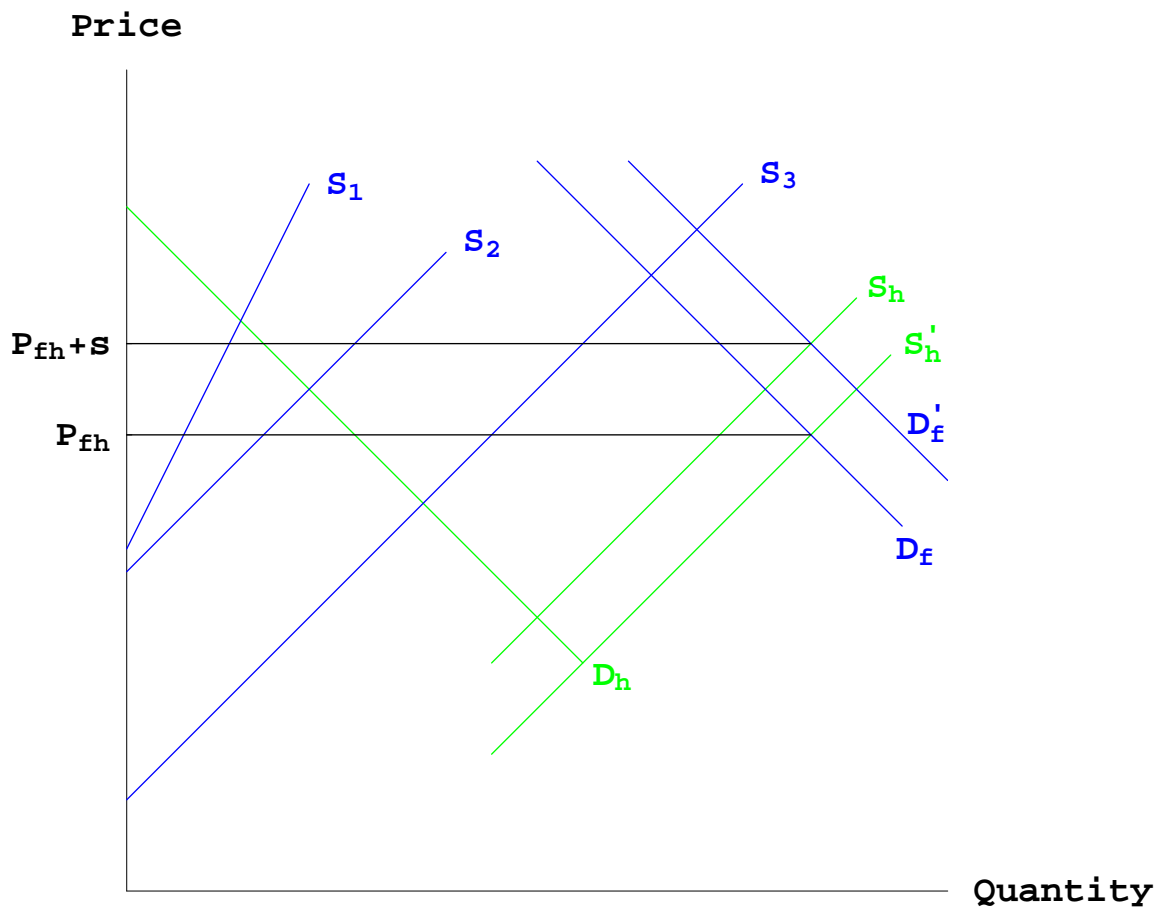


Figure 5: Large-country with export subsidy. Three foreign supply curves showing the three different types of equilibria.

price, P_h , between $P_{fh} + s$ and P_{hf} such that $S(P_h) = D(P_h)$. The foreign equilibrium price will then be $P_h - s$.

To see that no other type of equilibrium is possible note that if the foreign and domestic price differ by less than s then domestic producers will want to sell only in the foreign market. So the domestic price must be P_{hf} , i.e. the intersection of the foreign supply curve and the domestic demand curve. This price exceeds $P_{fh} + s$ and therefore the foreign market price must be greater than P_{fh} . However, the output of domestic producers exceeds the foreign quantity demanded at such prices. So there can be no other equilibria.

Case 2: $P_{fh} + s \geq P_{hf} > P_{fh}$

In this case it is easy to see that a domestic price of P_{hf} and a foreign price of P_{fh} is an equilibrium. Since this domestic price exceeds the foreign price by less than the subsidy, domestic producers will sell only in the foreign market and foreign producers will sell only in the domestic market. By definitions of P_{hf} and P_{fh} , both markets will clear. It should also be obvious that these can be the only equilibrium prices where the domestic price is less than the foreign price plus the subsidy.

To see that there cannot be an equilibrium where the domestic price is equal the foreign price plus the amount of the subsidy note that the domestic equilibrium price cannot exceed P_{hf} . This is because foreign producers sell all of their output in the domestic market when the domestic price exceeds the foreign price and P_{hf} is the price at which foreign supply equals domestic demand. At higher prices there would be excess supply in the domestic market. If the foreign price is s less than the domestic price then we would have the foreign price less than P_{fh} , since $P_{fh} + s \geq P_{hf} \geq$ the domestic

price. However, at such prices there is excess demand in the foreign market. Therefore there cannot be an equilibrium in which the domestic price differs from the foreign price by the amount of the subsidy.

Case 3: $P_{fh} \geq P_{hf}$

First, it is shown that in this case there is an equilibrium where the domestic price is equal to the foreign price. This price, P , will be such that world supply will equal world demand, i.e. $S(P) = S_f(P) + S_h(P + s) = D_h(P) + D_f(P) = D(P)$. Note that $S_h(P + s)$ is the curve S'_h in the figures.

By definition of P_{fh} , we have $S(P_{fh}) \geq D(P_{fh})$ since $S'_h = D_f$ and $S_f \geq D_h$ at this price. By definition of P_{hf} , we have $S(P_{hf}) \leq D(P_{hf})$ since $S'_h \leq D_f$ and $S_f = D_h$ at this price. Therefore, by the standard assumptions on demand and supply there is a price between P_{fh} and P_{hf} such that world demand equals world supply. At such an equilibrium price, domestic producers will sell only in the foreign market while foreign producers can sell in both markets. Note that it is possible that $P_{fh} = P_{hf}$. In that case world demand equals world supply at this common price.

To see that in this case there cannot be an equilibrium where the domestic price exceeds the foreign price note that the domestic price must not exceed P_{hf} , otherwise there will be excess supply in the domestic market. If the foreign price is less than P_{hf} it will also be less than P_{fh} in this case. At such prices, domestic producers do not satisfy the foreign demand. Since they are the only ones selling in foreign market when the foreign price is less than the domestic price, this cannot be an equilibrium.

Note that the three cases in the proposition are mutually exclusive. For any given demand and supply curves (and size of the export subsidy) only

one type of equilibrium will exist. This means that there are economies for which the usual equilibrium where the domestic price exceeds the foreign price by the amount of the subsidy will not exist.

4 Welfare Analysis

In the small-country case it is argued that the net welfare cost of an export subsidy is less than usually described. In Figure 1, this net welfare cost is area b instead of the sum of areas a and b . This is the same as the net welfare cost of a production subsidy of s per unit.

The welfare analysis of an export subsidy for a large country is straightforward and will not be explicitly done. Some differences from the usual analysis will however be mentioned. First, in some situations it is possible that the net welfare cost of an export subsidy is less than is usually described. For example, in Figures 3 and 4, the export subsidy can reduce the domestic price. Therefore, consumer surplus increases and so the welfare cost of the export subsidy could be less than in the usual case. However, it can be easily verified that in these figures the cost of the subsidy still exceeds the increases in consumer surplus and producer surplus.

A more important difference is that it is actually possible for an export subsidy to increase domestic net welfare. In [3], Feenstra says that this is not possible in this partial equilibrium competitive framework. The example in Figure 6 shows that, in fact, it is possible for an export subsidy to increase domestic net welfare in a partial equilibrium competitive model.

One important difference between this example and the other figures in this paper is that here the country imposing the export subsidy is a net

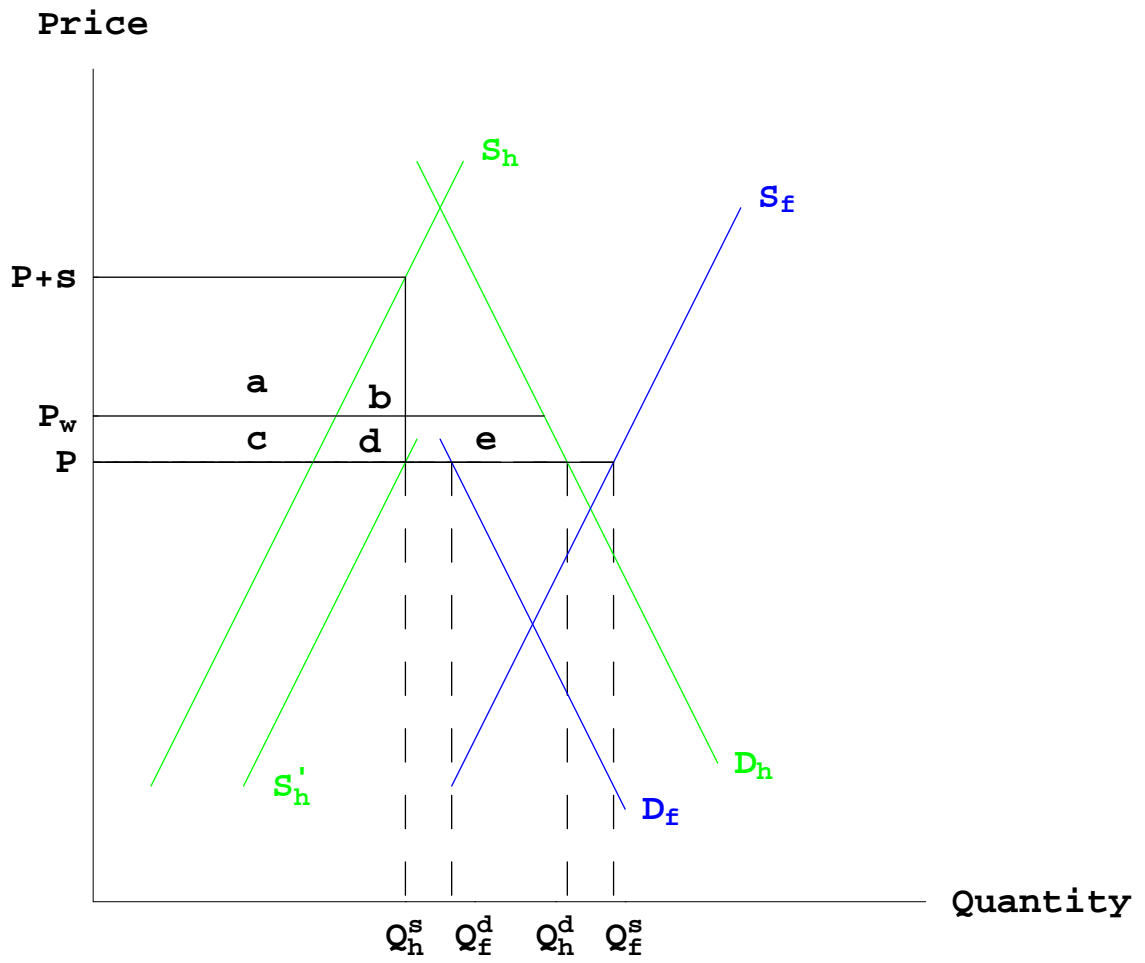


Figure 6: Export subsidy that increases domestic net welfare of a large country.

importer of the good under free trade. When the export subsidy is imposed, the new equilibrium has both the domestic price and the foreign price equal to P , which is lower than the no-subsidy free-trade price of P_w . This is true since $P_{fh} > P_{hf}$ in this example. This also means that all of the domestic output will be exported to the foreign market.

In this example the cost of the export subsidy is the area $(a + b + c + d)$. The increase in domestic producer surplus is given by area a since the net price received by the domestic producers increases from P_w to $P + s$ as a result of the subsidy. The increase in domestic consumer surplus is given by the area $(c + d + e)$ since the price the consumers pay falls from P_w to P as a result of the subsidy. Therefore, the total change in net welfare as a result of this equal to the area e minus the area b , which can be positive.

5 Conclusion

This paper has reexamined the partial competitive equilibrium analysis of an export subsidy. The usual textbook analysis ignores the incentives of foreign producers or it is implicitly assuming that there is some additional barrier to trade that prevents foreign producers from selling their output in the domestic market. If the price of the good is higher in one market than another then foreign producers will want to sell all of their output in the market with the higher price. The usual analysis assumes that this does not happen. Implicitly, the usual analysis does not describe the effects of an export subsidy alone. Instead, the usual analysis is of an export subsidy in combination with something that prevents foreign producers from selling all that they would want in the market imposing the subsidy. In practice, it is

probably true that export subsidies usually exist in combination with some kind of other trade barrier, such as a tariff or quota. However, one might expect that the exact effect of such a combination of policies depends on the precise nature of the additional barrier to trade. This paper has examined the case of an export subsidy being the only deviation from free trade. In such a situation, equilibria different from that of the usual analysis are possible.

In the small-country case, an export subsidy alone cannot change the price in the domestic market. If it did raise the price then foreign producers would want to sell their entire output in the small-country market. This would drive the price back to the free-trade level. So this paper argues that the effect of an export subsidy imposed by a small country is the same as the effect of a production subsidy of the same amount. If the export subsidy has no effect on the domestic price then domestic producers will want to export all of their output.

For large countries, it has been shown that the usual equilibrium where the price in the large country exceeds the price in the foreign market by the amount of the export subsidy is a possible equilibrium. In such an equilibrium, foreign producers will want to sell their output only in the country imposing the subsidy while producers in that market can sell their output in either market. However, such an equilibrium does not always exist. Depending on demand, supply and the amount of the subsidy, two other types of equilibrium can exist instead. One possibility is that the difference in the prices is less than the amount of the subsidy. In this case, all producers will export their output to the other market. Another possibility is that the export subsidy lowers the equilibrium price of the good in all markets. In

this case, producers receiving the export subsidy will want to export all of their output while foreign producers can sell their output in both markets. Which type of equilibrium occurs depends on the relationship between the amount of the export subsidy, the equilibrium price in the country imposing the subsidy assuming the supply consists of only foreign producers, and the equilibrium price in the foreign market assuming the supply consists of only producers receiving the export subsidy.

This paper also gives an example showing that it is possible for a large country to increase its net welfare by the use of an export subsidy. The existing literature argues that this is not possible in such a partial equilibrium competitive model. The example given here exploits the fact that there can be an equilibrium in which the price in the country imposing the subsidy can fall and therefore consumers (as well as producers receiving the subsidy) can benefit. Another potentially important feature of this example is that the country imposing the export subsidy is a net importer of the good under free trade. I believe that this is a necessary feature in order to have export subsidies increase domestic net welfare; although, this is not proved in this paper. Of course, export subsidies still lead to a decline in world net welfare.

Another implication of this example is that it might provide an additional reason why export subsidies seem to be extremely common. The usual analysis explains this by appealing to some kind of political model where producers (who always gain from an export subsidy) have more power than consumers (who are usually thought to always lose from such a subsidy). However, if export subsidies can result in a gain in net welfare then it makes them more likely to be enacted no matter what the political institutions are. The exam-

ple also shows that the partial equilibrium model is more symmetric between tariffs and export subsidies than usually thought. It is well known that a large country might be able to increase net welfare by imposing a tariff in a static partial competitive equilibrium model. Here, it has been shown that this is also true for export subsidies.

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