Technical Annex

## Reform of Agricultural Export Programs

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> This document is the technical annex to the full paper "Reform of Agricultural Export Credit Programs," which is available separately.

The traditional method of accounting for an export subsidy is described in figure 1. This is a simplified model of trade, with one exporter and one importer. The domestic markets for the exporter and importer are shown in the left and far right panels of figure 1. The centre panel represents international market clearing and world price determination. The curve ES, or excess supply, represents the horizontal difference between the supply and demand functions in the exporter's market and represents the schedule of surplus quantities that are offered onto the world market at each price. The curve ED, or excess demand, represents the horizontal difference between the demand and supply functions in the importer's domestic market, and represents the schedule of quantities of imports demanded at each price. The world price, P_0, is determined by the intersection of excess supply and excess demand. This price just ensures that world markets clear.

The introduction of an export subsidy provides a per unit discount for all importers. This is represented graphically by a rightward shift of the excess supply schedule to ES'. The vertical difference between the old and new excess supply functions is equal to the unit export subsidy. The export subsidy depresses prices in import markets. The price in export markets will increase because product is being shifted from the domestic market to the export market. The incidence of the subsidy (i.e., how much it increases exporter's prices and depresses importers prices) is determined by the slopes of the excess supply and excess demand functions. For example, with a very inelastic (steep) excess demand schedule, most of the incidence will result in higher prices in the exporter's market.

Figure 1
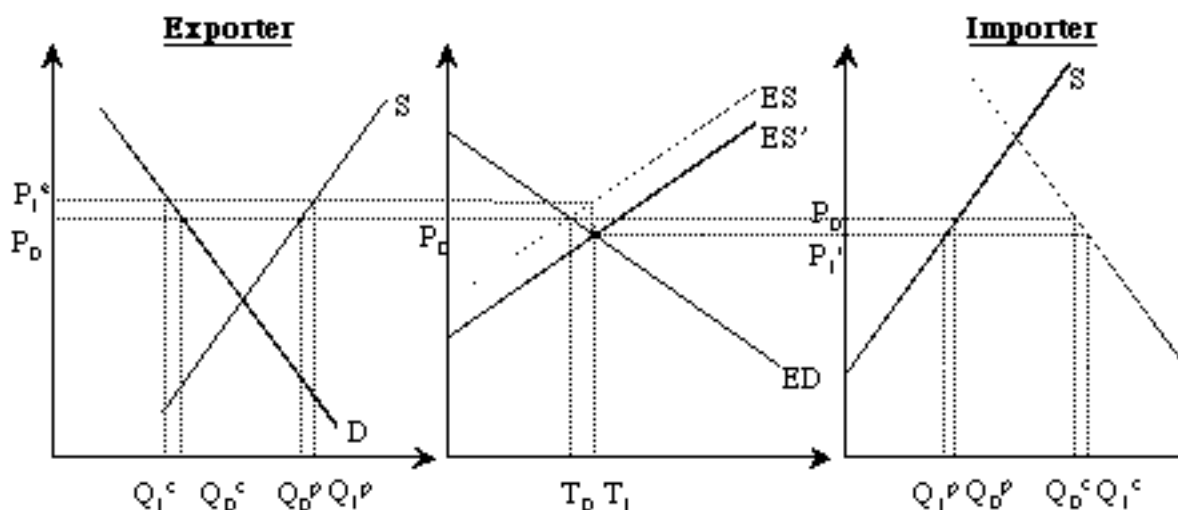
Exporter   *Importer*

Domestic Production Subsidies

A production subsidy drives a wedge between the world price and the domestic producer price. This is illustrated in figure 2 in the left-hand panel, the exporter's domestic market. The production subsidy shifts the domestic supply function to the right from S to S'. This, in turn, shifts the excess supply function from ES to ES", lowering the world price, marginally, to P_2. In the exporter's home market the producer price is equal to the world price P_2 plus the production subsidy. The consumer price P^c_2 remains at the new world price level. The wedge between the producer and consumer price results in increased production

Figure 2


Exporter   *Importer*
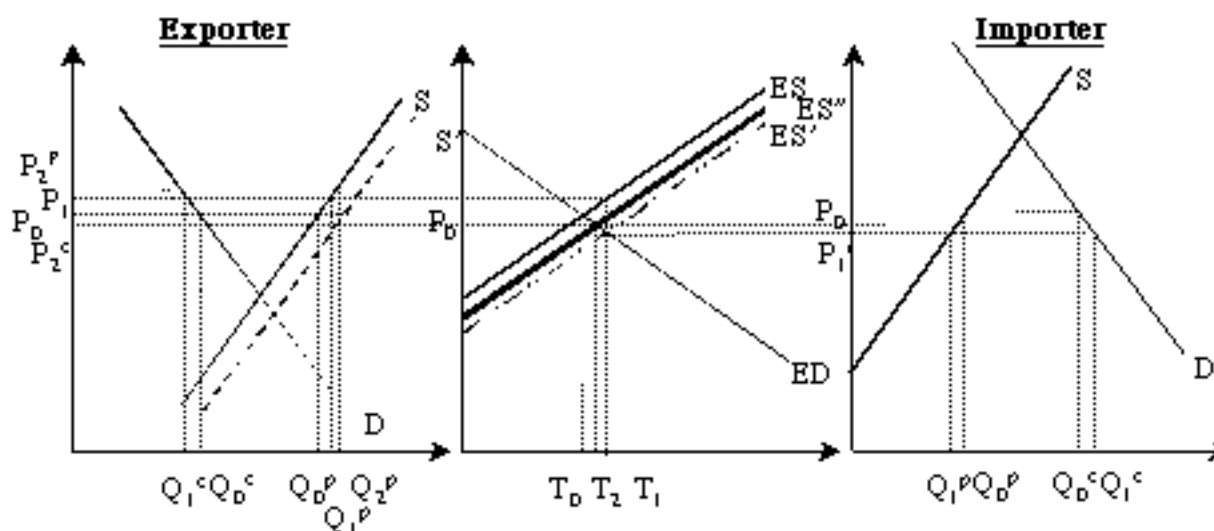
and minimally lower consumption and leads to an increase in the exportable surplus. However, the increase in the exportable surplus is smaller than the increase in this surplus with an export subsidy, despite the fact that the two subsidies are of equal size. Hence, the production subsidy is seen to be less distorting than an export subsidy.

Targeted Export Subsidies

The introduction of export subsidies, which are only targeted at particular markets, will only depress prices in these markets. This is illustrated in Figure 3.

Figure 3
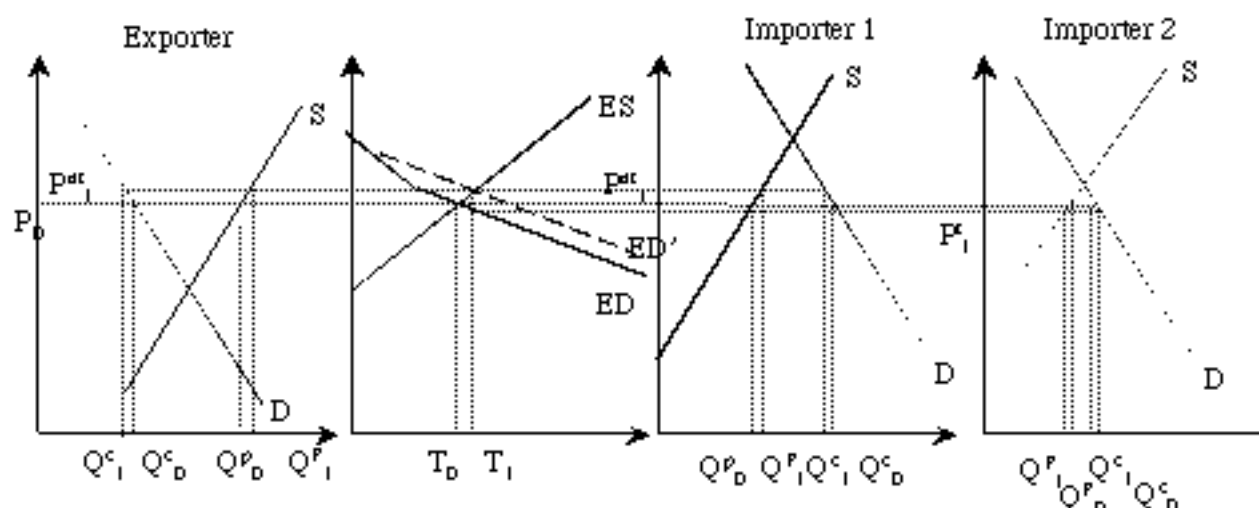
In this depiction there are two importing countries, shown in the two panels that are furthest to the right in figure 3. The panel that is second from the left represents international market clearing and world price determination. The excess demand function is now kinked because it is the horizontal summation of the excess demands for each of the importers. In the initial equilibrium position, the intersection of excess supply and excess demand determines one world price and the volume of trade. The introduction of a targeted export subsidy shifts the excess demand function for importer 2 up by the amount of the unit export subsidy. This shifts the summation of the excess demand curves and shifts the kink to the left so that the new aggregate excess demand function is ED'. There are now two world prices. The first world price P^{nt}_1 is determined by the intersection of the new excess demand function ED' and ES. This is the price in non-targeted markets, including the exporter's market and importer 1's market. The second world price is the price in importer 2's market, P^t_1 , which is equal to P^{nt}_1 less the export subsidy. The quantity of production increases in the home markets of the exporter and importer 1. The quantity of

domestic consumption decreases in these markets. As a consequence the exportable surplus increases, and imports by importer 1 decrease. The opposite effect occurs in importer 2's market, where consumption increases, production decreases and imports increase.