



## Agricultural and Food Policy (4201-410)

# Policy Analysis of General A-F Policy Instruments

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Daily, 14.15 - 17.30, HS 23

Lecture notes and further information:  
<http://www.uni-hohenheim.de/apo>



## LECTURE OUTLINE



### ▪ Policy Analysis of General A-F Policy Instruments

The lecture has two objectives:

- first, to introduce some of the more common policy instruments used in agricultural market interventions;
- second, to show how the price, quantity and welfare effects of these policy instruments can be calculated.

## Policy Analysis of General A-F Policy Instruments



### IMPACT ANALYSIS

#### Interventions are of two kinds

- ***incentive schemes***  
(designed to change people's behaviour but with income distribution effects e.g. road pricing, carbon tax)
- ***transfer schemes***  
(designed to change income distribution, but with allocation effects, e.g. farm supports)

#### Task of analyst:

- for ***incentive schemes***: to trace out the actual changes in behaviour (allocation effects) and to value the benefits of the change

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## Policy Analysis of General A-F Policy Instruments



#### Task of analyst (contd.):

- for ***transfer schemes***: the benefits may appear at first to be equal to the size of the transfer.  
But: Analyst must be aware that the actual incidence of a tax or subsidy is not the same as its initial incidence.  
⇒ By *changing their behaviour*, agents can shift their liability or eligibility. ⇒ So again we need to model behaviour in order to assess the benefits.
- modelling the impact of policy interventions can be *complex* where there are linkages between markets and more than one market may be affected.

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## Policy Analysis of General A-F Policy Instruments



### **COST**

- most obviously: budget costs or consumer costs (in case of market price interventions);
- less obviously: overall cost to society. How much poorer is society overall?

### **EQUITY - WHO PAYS OR BENEFITS?**

- Can be concerned with broad transfers between groups, or within groups with the distribution of benefits or costs.
- There may be an issue of weighting benefits and costs accruing to different groups (cf. political preference function).

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## Policy Analysis of General A-F Policy Instruments



### **EFFICIENCY**

- in the case of incentive schemes, we are interested in the benefit/cost ratio (weighted where appropriate);
- in the case of transfer schemes, we are interested in the transfer efficiency. Would it be possible to make the transfer at less cost using some alternative mechanism?

### **MEASURING WELFARE CHANGES**

- Capturing policy interventions:

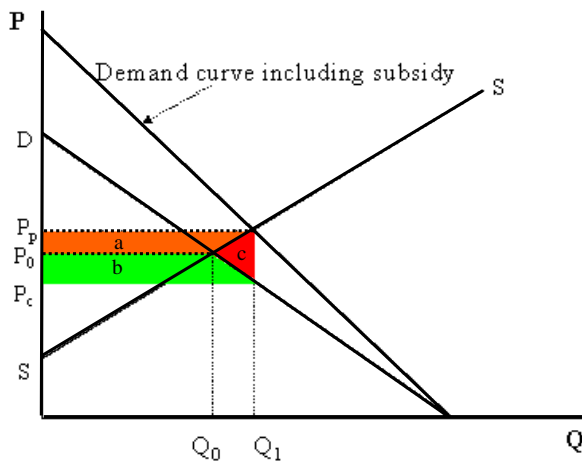
- Policy analysis consists of tracing through the consequences of government interventions in a market, or series of linked markets, to determine
  - (a) the price and quantity changes induced by the policy intervention, and
  - (b) the welfare effects of these changes

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## Closed Economy Policy Intervention - Introduction of a consumer subsidy



⇒ Government introduces a proportionate consumer subsidy



$P_c$  = consumer price  
 $P_p$  = producer price

In order to restore the market equilibrium following the introduction of the subsidy, the market price (including the subsidy) rises to  $P_p$  and the quantity supplied rises to  $Q_1$ .  
- but consumers still pay  $P_c$

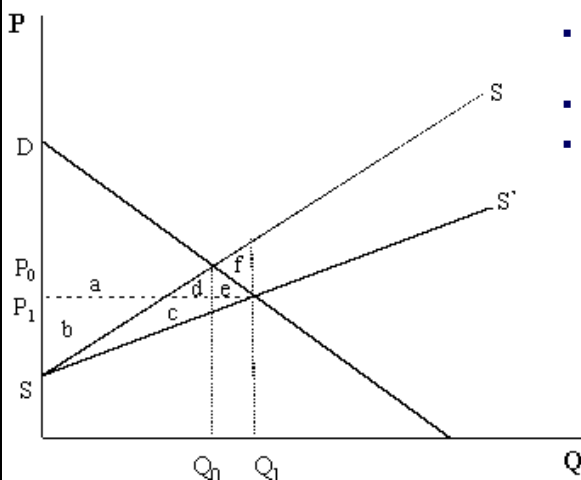
Change PS = a (orange)    Change taxpayer expenditure =  $-(a+b+c)$  (total coloured area)  
Change CS = b (green)    Deadweight cost to society =  $-c$  (red)

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## Closed Economy Policy Intervention - Introduction of a fertilizer subsidy



⇒ government introduces an ad valorem fertiliser subsidy (i.e. a proportionate subsidy, not a specific absolute amount) ⇒ lowers the marginal cost of producing food and results in the supply curve rotating downwards to  $S'$



- Consumers clearly better off, as a result of falling prices.
- Effect on producers is ambiguous.
- Cost of the fertiliser subsidy to the taxpayer = value of the fertiliser subsidy = reduction in the cost of wheat production to farmers

$$\Delta CS = a+d+e$$

$$\Delta PS = (b+c) - (a+b) = c-a$$

$$\Delta \text{ taxp. expenditure} = -(c+d+e+f)$$

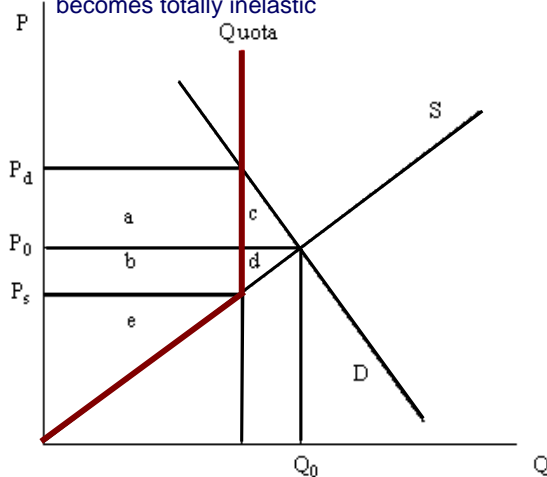
$$\Delta \text{ total welfare} = -f$$

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## Closed Economy Policy Intervention - Introduction of a production quota to control supply



⇒ One way to represent a production quota is as a vertical supply curve at the point where the quota becomes binding. ⇒ To the right of the quota, if the price increases, the producer is prevented from increasing supply and the supply curve becomes totally inelastic



$$\begin{aligned} \Delta CS &= -(a+c) \\ \Delta PS &= + (a+b+e) - (b+d+e) \\ \Delta \text{ taxp. expenditure} &= 0 \\ \Delta \text{ total welfare} &= -c-d \end{aligned}$$

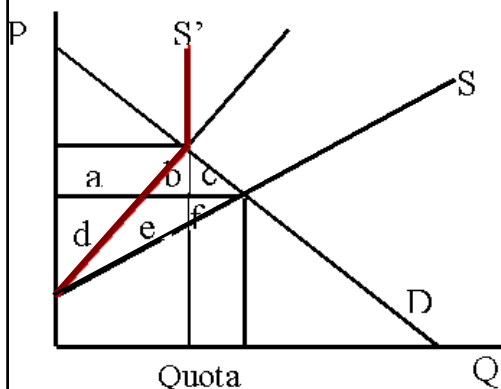
⇒ As with any quantitative restriction in a market economy, a production quota gives rise to *quota rents* (= a+b)

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## Closed Economy Policy Intervention - Introduction of a production quota to control supply



⇒ Representing a production quota as a kinked demand curve as in the previous figure assumes that only the highest cost production is eliminated to stay within the quota.  
⇒ In reality the more usual approach to quota administration is that each producer, both the most efficient (i.e. lowest cost) and least efficient (i.e. highest cost) producers are cut back by a proportionate amount.



⇒ represented in the figure by a rotation upward of the supply curve. The kink occurs in the new de facto supply curve.

⇒ economic cost are higher in this case.

$$\Delta \text{ total welfare} = -(b+c+e+f)$$

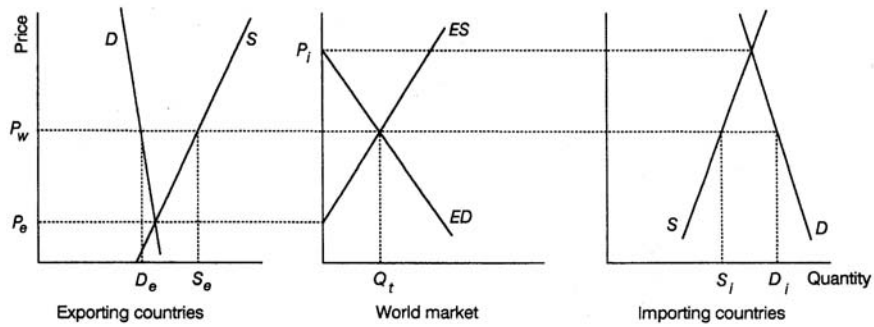
⇒ economic costs can be minimised by allowing trade in quotas

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## Open Economy Policy Intervention



Price, production and quantity under free trade:

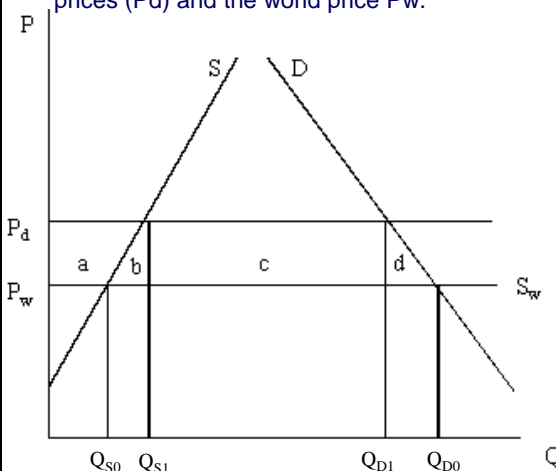


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## Open Economy Policy Intervention - Import Tariff



⇒ Tariffs are simply taxes that are levied on products as they enter a country.  
 ⇒ The volume of imports falls, and the domestic price rises by the amount of the tariff. ⇒ The tariff creates a wedge between the domestic producer and consumer prices ( $P_d$ ) and the world price  $P_w$ .



- $b$  = excess resource cost of producing at home what would be cheaper to import from abroad,
- $d$  = cost to consumers of being forced to alter their preferred basket of consumption commodities.

$$\Delta CS = -(a+b+c+d)$$

$$\Delta PS = a$$

$$\Delta \text{ taxp. expenditure} = c$$

$$\Delta \text{ total welfare} = -b-d$$

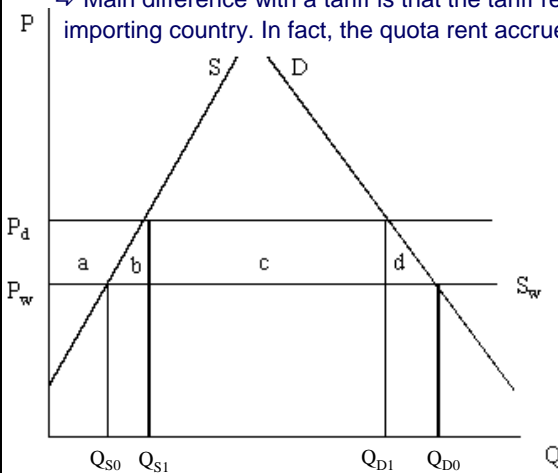
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## Open Economy Policy Intervention - Import Quota



⇒ Can be illustrated using the same diagram as an import tariff ⇒ but the price and welfare effects are not necessarily the same. ⇒ By restricting imports the domestic price can be increased from  $P_w$  to  $P_d$ .

⇒ Main difference with a tariff is that the tariff revenue (c) is foregone by the importing country. In fact, the quota rent accrues to the exporting country.



$$\begin{aligned} \Delta CS &= -(a+b+c+d) \\ \Delta PS &= a \\ \Delta \text{ taxp. expenditure} &= 0 \\ \Delta \text{ total welfare} &= -b-c-d \end{aligned}$$

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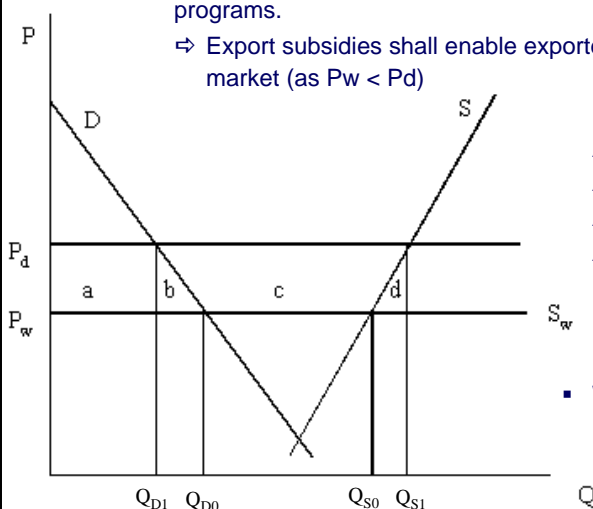
## Open Economy Policy Intervention - Export Subsidy



⇒ An export subsidy is a government payment per unit of product exported.

- Made to: Increase producer price or dispose surplus created by domestic programs.

⇒ Export subsidies shall enable exporters to sell a product on the world market (as  $P_w < P_d$ )



$$\begin{aligned} \Delta CS &= -(a+b) \\ \Delta PS &= a+b+c \\ \Delta \text{ taxp. expenditure} &= -(b+c+d) \\ \Delta \text{ total welfare} &= -b-d \end{aligned}$$

- Why are they trade distorting?

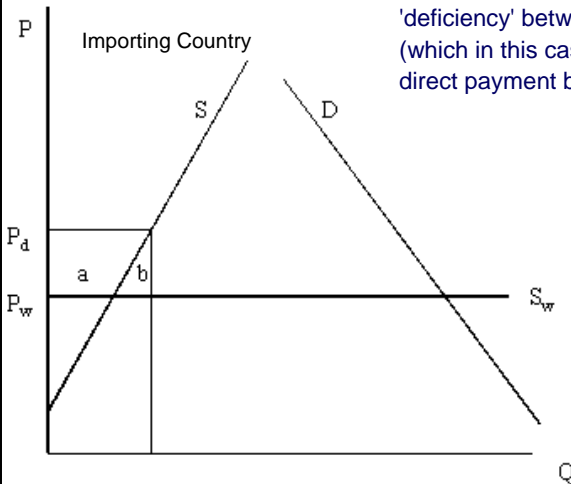
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## Open Economy Policy Intervention - Deficiency Payment



- Deficiency payments are particularly attractive to an importing country that wishes to maintain a cheap food policy for its consumers.

⇒ Farmers are guaranteed a target price  $P_d$ , and any 'deficiency' between it and the actual market price (which in this case is the world price) is paid as a direct payment by the government.



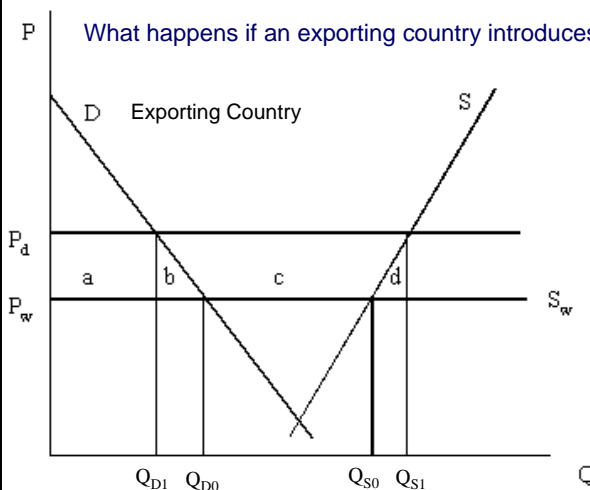
- $\Delta CS = 0$
- $\Delta PS = a$
- $\Delta \text{ taxp. expenditure} = -(a+b)$
- $\Delta \text{ total welfare} = -b$
- ⇒ limit government's exposure?

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## Open Economy Policy Intervention - Deficiency Payment



What happens if an exporting country introduces a deficiency payment?



- $\Delta CS = 0$
- $\Delta PS = a+b+c$
- $\Delta \text{ taxp. expenditure} = -(a+b+c+d)$
- $\Delta \text{ total welfare} = -d$

But: large exporting country might have high impact on  $P_w$ .

⇒ again: limit government's exposure by setting a ceiling on the maximum amount of production which will be supported (either on a per farm or national basis).

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