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Pearson received his B.S. in American Institutions (1961) from the University of Wisconsin, his M.A. in International Relations (1965) from Johns Hopkins University, and his Ph.D. in Economics (1969) from Harvard University. He joined the Stanford faculty in 1968.

Some governments in developing countries enact policies that lower prices in agricultural markets. The purpose usually is to improve the food security of consumers, especially poor people, by giving them access to more food at lower prices. Often this policy is part of a broader program to alleviate poverty by reducing the cost of food, a key component of the total expenditures of poor people.

This lecture introduces approaches to study the impacts of government policies that lower prices in agricultural markets on government objectives – efficiency, equity, and food security.

Slide 3

A divergence on output prices, causing private revenues (A) to differ from social revenues (E), creates an output transfer (I = (A – E)). This divergence can be either positive (causing an implicit subsidy or transfer of resources in favor of the agricultural
This lecture addresses negative output divergences by examining policies that lower the prices of agricultural commodities. The previous lecture (lecture 5) looked at policies that raise agricultural commodity prices and thus cause positive output transfers.

Subsidies on agricultural commodities result in transfers from the public budget and producers to consumers. Some subsidy policies do not affect the domestic price and thus create transfers only from the government budget to consumers. Other subsidy policies reduce the domestic price and thus create transfers from both the government budget and producers to consumers.

A subsidy only on imports of a food commodity reduces the domestic price, decreases amounts produced domestically, raises amounts consumed domestically, and increases quantities imported. Domestic producers implicitly pay much of the cost of the policy by receiving a lower price for food and transferring welfare to consumers. If most food is produced domestically rather than imported, the government budgetary cost of the policy is limited. Producers then bear the brunt of the policy transfer.

A subsidy on all domestic consumption of a food commodity does not change the domestic price or the quantity produced domestically, and the policy increases quantities consumed domestically and imported. The entire increase in domestic consumption thus is met by additional imports. Producers are unaffected and hence do not transfer any income to consumers. The entire transfer is made from the government treasury to consumers. The budgetary cost can be immense since the subsidy is paid on all food consumed, supplied by both domestic production and imports.
The diagram portrays an importable food commodity. The domestic price before any policy is imposed, OP$_1$, is determined by the behavior of producers and consumers – the supply and demand schedules – and by the availability of food imports at the cif import parity price, OP$_1$.

In the absence of government policy, the domestic price, OP$_1$, is determined by the import parity price (lecture 4, slides 9 and 10).
The target domestic price with policy is set by policy makers to be $OP_2$. The required subsidy to consumers – to be achieved through the policy of subsidizing only imported food – is $P_1P_2$, the difference between the actual price ($OP_1$) and the lower, desired target price ($OP_2$).

Slide 7

The effects of the trade restriction policy are found by comparing quantities, transfers, and efficiency effects. The initial conditions are set by the price equilibrium before policy (the “no policy” case). Then a new price equilibrium is found with the subsidy on imported food in place (the “subsidy policy” case). A comparison of these two cases yields the impacts of the subsidy policy on the initial conditions (the “effects of policy” case).

Slide 8
The “no policy” case depicts the results before any policy is introduced. At price $OP_1$, domestic production (at b) is $OQ_1$ and imports are $bc = Q_1Q_2$. Together domestic production plus imports equal domestic consumption (at c) of $OQ_2$ and so the market-clearing condition is fulfilled (lecture 4, slide 6).

The “subsidy policy” case portrays the outcome of introducing a subsidy on imported food only. At the new subsidized price, $OP_2$, domestic production (at e) is $OQ_3$ and imports are $eh = Q_3Q_4$. Together, domestic production plus imports equal domestic consumption (at h) of $OQ_4$ and so the market-clearing condition is again fulfilled.

The “effects of policy” row shows the differences caused by the subsidy policy. At price $OP_2$, domestic production (at e) decreases by $Q_3Q_1$ to $OQ_3$, domestic consumption (at h) rises by $Q_2Q_4$ to $OQ_4$, and imports increase by the sum of these two effects and expand from $Q_1Q_2$ to $Q_3Q_4$.

Slide 9

![Diagram showing the effects of a subsidy (only on imported food) on transfers from or to consumers, producers, and the government treasury.](image_url)

This diagram shows the effects of a subsidy (only on imported food) on transfers from or to consumers, producers, and the government treasury. The subsidy policy causes the domestic price to fall (from $OP_1$ to $OP_2$). This price reduction induces less domestic production, but the policy raises domestic consumption and imports (slide 7). These changes in price and quantities create transfers among participants in the economy.

Slide 10
Prior to imposition of the subsidy policy (the “no policy” case), the producers of the commodity enjoy a **producer surplus (excess profits where returns exceed costs)** of the triangle $P_1b_i$, the difference between their total revenues of $P_1bQ_1O$ and their total costs of $ibQ_1O$. Before policy, consumers have a **consumer surplus (the difference between their satisfaction as measured by their willingness to pay and the amounts they actually pay)** of the triangle $P_1jc$, the difference between their total consumer satisfaction of $jcQ_2O$ and their total amount paid of $P_1cQ_2O$.

**Producers lose from the subsidy policy that decreases the domestic price.** At the new, lower price of $OP_2$, producers make excess profits (producer surplus) of only $P_2ei$, the difference between their decreased total revenues of $P_2eQ_3O$ and their new total costs of $ieQ_3O$.

**Consumers gain significantly from the subsidy policy.** At the new price of $OP_2$, consumer surplus is increased to $P_2jh$, the difference between their much higher total consumer satisfaction of $jhQ_4O$ and their new total amount paid of $P_2hQ_4O$.

Before the subsidy policy is introduced, there is no impact on the government budget. The policy to subsidize imported food requires the government to transfer funds from the treasury to food consumers. **The government spends a total of adhe, because a subsidy of $P_1P_2$ (or ae) per ton of food imports is spent on $Q_3Q_4$ (or ad) tons of food imports.**

In total, the transfer effects of this policy are: from the government treasury, adhe; from producers, $P_1beP_2$; to consumers, $P_1chP_2$; a production efficiency loss, $abe$; and a consumption efficiency loss, $cdh$.
This diagram shows the efficiency losses caused by the policy to subsidize imported food. The subsidy decreases the domestic price and domestic production and increases domestic consumption and imports (slide 7). These changes in price and quantities create transfers among participants in the economy (slide 9). The transfers away from producers and the government budget are greater than the gains to consumers. The difference consists of efficiency losses, shown by the two orange triangles, abe and cdh.

Slide 12

In the absence of market failures, the most efficient outcome is achieved without policy. The introduction of a subsidy on imported food thus creates efficiency losses.
By lowering the domestic price, the subsidy policy causes domestic production to decline. **The production efficiency loss, abe, arises because the lost domestic production, Q_3Q_1, costs ebQ_1Q_3 in scarce resources, less than the cost of the imports that replace that output, abQ_1Q_3.** The country is inefficiently paying more for these imports than it would cost to produce the food domestically.

**The consumption efficiency loss, cdh, results because the value to consumers of the Q_2Q_4 of additional consumption met by imports is chQ_4Q_2, which is less than the cost of these imports, cdQ_4Q_2.** Consumers gain from the subsidy policy by eating more food at a lower price, but the addition to food consumption is valued less by consumers than the import cost of that extra food.

The two efficiency losses, the production efficiency loss, abe, and the consumption efficiency loss, cdh, together constitute the difference between the sum of the transfers away from producers, P_1beP_2, and the government treasury, adhe, and the transfer to consumers, P_1chP_2.

**The impact of a subsidy policy (only on food imports) on efficiency is negative.** The policy is distorting because it reduces the domestic price and thus creates two types of efficiency losses – a production efficiency loss, by making some efficient domestic production unprofitable, and a consumption efficiency loss, by inducing the consumption of imports that cost more than their value to consumers.

**The impact of a food subsidy policy on equity is not clear.** It depends on the weights that policy makers place on the welfare of consumers, who gain, versus the welfare of producers, who lose, and of the government treasury, which pays to subsidize food imports. The equity effect might depend on whether the consumers of
the food commodity were relatively better or worse off than the producers of that commodity before the policy.

**The impact of a food subsidy on food security is also unclear from the analysis.** The policy causes an increase in domestic food consumption, but that increase is met entirely by an expansion of food imports. The determination of the food security effect requires further analysis of the variability of domestic versus international prices and quantities of the food commodity. Greater domestic exposure to food imports could lead to either more or less domestic stability of food prices and supplies.

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The **strategy is to reduce food prices** to transfer incomes to consumers and to improve their household food security.

The **policy is to subsidize imports of food (but not domestic production of food) to lower the price of food**.

The **constraints in the domestic economy are captured by the domestic supply and demand schedules and the import price** (reflecting the international supply schedule). A lower domestic price increases local consumption, reduces local production, and increases imports.

The **impact of this strategy on the objectives of policy makers is mixed**. Efficiency is worsened, equity is improved (if consumers are favored over producers), and food security is unclear (national food security is likely to be worsened, unless international markets are very reliable, but household food security is likely to be improved).
Further analysis is required before policy makers can properly weigh trade-offs between objectives.

A switch to aiding consumers through a subsidy on all food consumption (of food produced domestically and imported) is doubtful given its large budgetary cost, but it would be less inefficient (because it would avoid imposing a production efficiency loss).

**Slide 15**

**Subsidy on All Domestic Food Consumption – Diagram**

In the absence of policy, the domestic price, $OP_1$, is determined by the import parity price. At price $OP_1$, domestic production (at a) is $OQ_1$, domestic consumption (at b) is $OQ_2$, and imports are $ab = Q_1Q_2$.

The target food price is $OP_2$, and the required subsidy is $OP_1$ less $OP_2$, or $P_1P_2$ per unit. Under the subsidy on all domestic food consumption, the domestic price remains unchanged at $OP_1$. For each ton produced and marketed, the producers continue to receive price $OP_1$ so they continue to produce at point a. The subsidy from the government treasury, $P_1P_2$, is paid on all food produced domestically, $OQ_1$, and imported, $Q_1Q_4$. Food consumption thus expands from point b to point g, and this expansion is met by an increase in imports of $Q_2Q_4$.

**Slide 16**
target price \( (OP_2) = \text{price} \ (OP_1) - \text{subsidy} \ (P_1P_2) \)

effects of consumer subsidy
- quantities – consumption expands, production is unchanged, imports increase
- transfers – from treasury to consumers
- efficiency losses – in consumption, but not in production

limitations – high budgetary cost

With the subsidy on all domestic food consumption, domestic production (at a) remains at \( OQ_1 \), domestic consumption (at g) expands from \( OQ_2 \) to \( OQ_4 \), and imports expand by \( Q_2Q_4 \), from \( Q_1Q_2 \) to \( Q_1Q_4 \).

If the subsidy of \( P_1P_2 \) per unit is applied to all domestic consumption, \( OQ_4 \), the total subsidy cost is \( P_1cgP_2 \), paid entirely by the government treasury.

The transfer effects of this policy are: from the government treasury, \( P_1cgP_2 \); to consumers, \( P_1bgP_2 \); and a consumption efficiency loss, \( bcg \). **The consumption efficiency loss arises because the expanded domestic consumption, \( Q_2Q_4 \), costs \( bcQ_4Q_2 \) in spending on extra imports, whereas the additional consumption is valued by consumers at only \( bgQ_4Q_2 \). There is no production efficiency loss because producers continue to face price \( OP_1 \) and thus continue to produce quantity \( OQ_1 \) at point a.**

**Application of the producer subsidy in developing countries is limited.** For most governments, the high budgetary cost rules out subsidies on all food consumption.

Slide 17
Two price policy instruments are available to benefit consumers of a food commodity.

A subsidy only on imported food lowers the domestic price of food to the benefit of food consumers. The cost of the policy is paid by the government treasury and by producers of the food commodity. The policy transfer creates greater consumer surplus for food consumers. Because the domestic price is decreased, the policy creates both production and consumption efficiency losses.

A subsidy on all domestic food consumption lowers the per unit cost to food producers (by the amount of the subsidy) but does not decrease the domestic price of food. The cost of the policy to subsidize all food consumption is paid entirely by the government treasury (and thus indirectly by consumers and producers who have been taxed to generate government revenue). Producers of food are not affected by this subsidy policy. The transfers are from the treasury to food consumers, who gain additional consumer surplus, and to a consumption efficiency loss, arising from the cost of additional food imports exceeding the value of that food to consumers.