

# International Trade and Monetary Systems

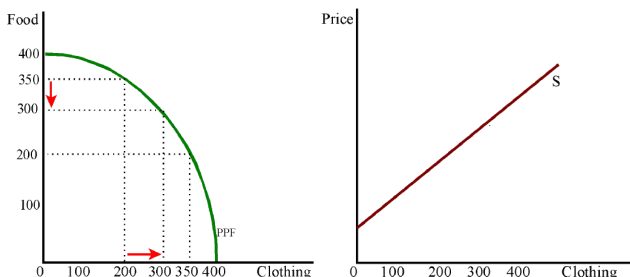
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2015

## The Small-Country General Equilibrium Model

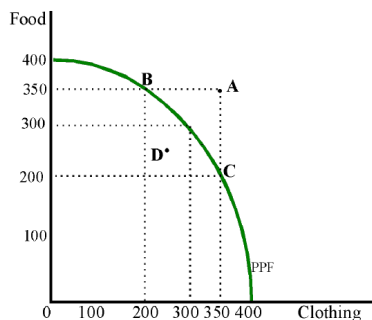
- ▶ The small country general equilibrium model of international trade provides a logical explanation of why indirect production is good for human welfare.
- ▶ The small-country model assumes that the actions of its citizens have no noticeable effects on foreign prices or the quantities produced by foreign industries.
- ▶ The model's general equilibrium nature means that it traces the effects of an economic change to all sectors of the domestic economy.
- ▶ To enable us to use two-dimensional diagrams, the model assumes that there are just two industries in the world economy.

### Production Possibilities Frontier



- ▶ The slope of the PPF reflects the rate of transformation, the rate at which the economy can add to the output of one product at the cost of reducing the production of the other product (the opportunity cost).
- ▶ The bowed-out PPF curve shows increasing (opportunity) costs for two industries just as the familiar supply curve shows increasing costs for a single industry.

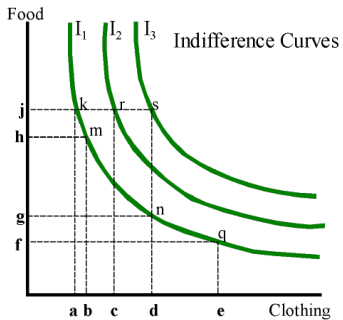
### Production Possibilities Frontier



- ▶ A closed economy must produce and consume at points located on or below the PPF.
- ▶ The points B, C, and D are all attainable. The point A outside the PPF is not feasible.

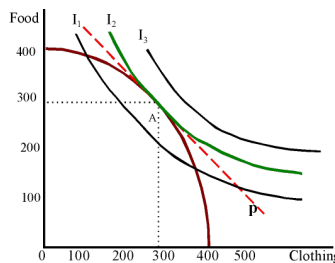
### Indifference Curves

An indifference curve is a set of combinations of goods that are valued equally, a set of combinations of goods among which consumers are indifferent.



- ▶ The higher the indifference curve, the higher the level of welfare associated with the combinations of goods on the curve.
- ▶ The curves' convexity implies that consumers value one good more highly the less of it they have relative to the other good.

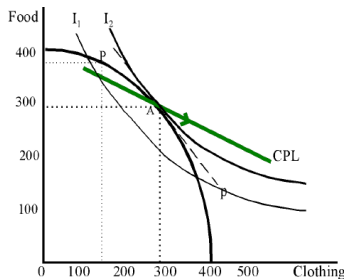
The welfare-maximizing production/consumption combination is at the point where the PPF and the indifference curves have the same slope.



- ▶ The tangency between the PPF and the indifference curve at A is where the relative opportunity costs of producing food and clothing are equal to the relative marginal benefits from consuming food and clothing.
- ▶ The slope of the tangent, labeled p in the diagram, represents the relative prices of food and clothing.

## Gains from Trade

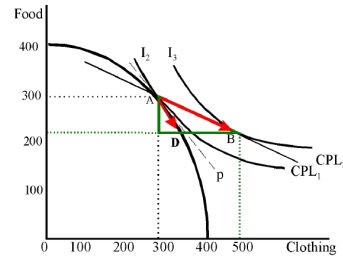
If the world price ratio is different from the domestic price ratio  $p$ , an open economy can use foreign trade to reach consumption points outside its PPF.



- ▶ The diagram shows the consumption possibilities line (CPL) whose slope reflects the world price ratio.
- ▶ A small open economy that continues to produce at A can consume anywhere along the CPL.

## Gains from Trade

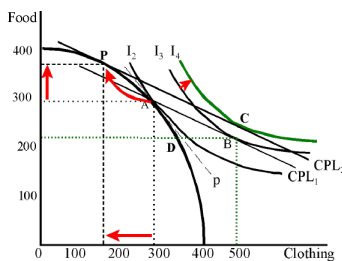
Exchange with foreigners lets consumers convert the bundle of food and clothing produced at A to the bundle at point B.



- ▶ Point B is at the tangency of the indifference curve and the CPL, where the relative marginal gains from consuming food and clothing are equal to the world price ratio.
- ▶ Trade is represented by the green trade triangle.

## Specialization

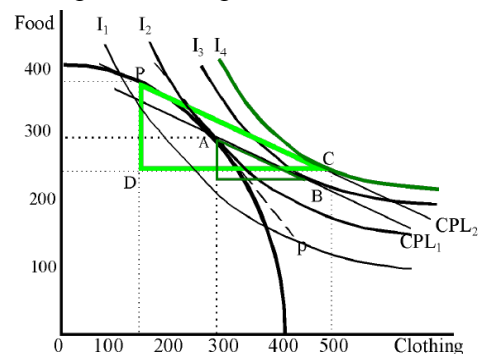
An open economy can achieve further gains from trade by specializing.



- ▶ The international price ratio, represented by the slope of the CPL, leads profit-maximizing food producers to increase production by bidding away resources employed in the clothing industry.
- ▶ Production shifts to P.
- ▶ Welfare rises further than if production remains at A.

## The Gains from Trade

- ▶ The combination of exchange and specialization provides a higher welfare level.
- ▶ Specialization implies a higher level of trade, as evidenced by the larger trade triangle.



- ▶ When relative prices (opportunity costs) of goods are not the same at home and abroad, countries can increase national welfare by engaging in international trade.
- ▶ Gains from exchange are the result of domestic consumers substituting the relatively cheaper foreign products for the relatively more expensive domestic products.
- ▶ Gains from specialization are the gains from shifting domestic resources toward producing products that are relatively more expensive overseas.
- ▶ If indirect production (export and import) uses fewer resources to gain a product, then specialization and trade should be used to acquire the product.
- ▶ Protecting one industry from imports and keeping (consumption in) the economy at a point on the PPF will restrict the growth of other industries and prevent welfare from rising.

## Trade is Like a One-time Spurt of Economic Growth

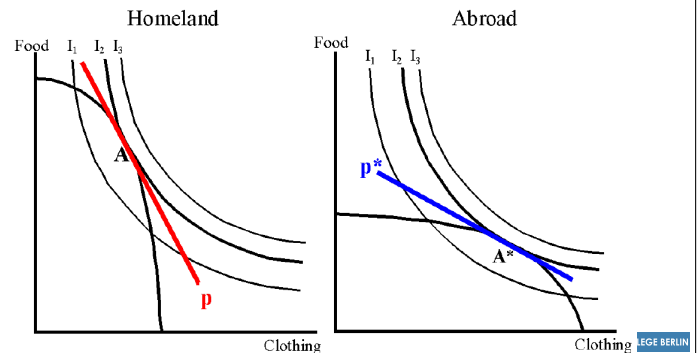
- ▶ International trade enables the economy to reach a higher indifference curve.
- ▶ Trade indirectly permits the economy to produce more real output with the same stock of resources.
- ▶ Trade is a one-time improvement in production technology!

## The Limitations of the Small-Country Model

- ▶ Few economies are truly "small countries."
- ▶ In general, international trade alters the prices that countries trade at.
- ▶ The small-country model can only tell us how one country is affected by international trade.
- ▶ The small-country model assumes that there are no effects on the rest of the world.
- ▶ In general, international trade causes changes in prices and shifts in resources both at home and abroad.
- ▶ We therefore need to develop a two-country general equilibrium model that explains trade between two countries and describes the many changes that occur in both countries as a result of the opening up of trade.

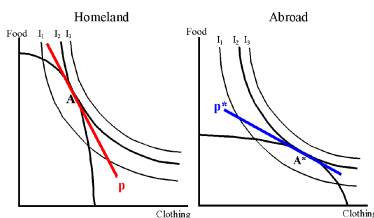
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- ▶ Suppose there are two countries with identical consumer preferences,
- ▶ yet, each of the two countries has a unique PPF.
- ▶ Identical consumer preferences with unique PPFs implies different price ratios in the two countries



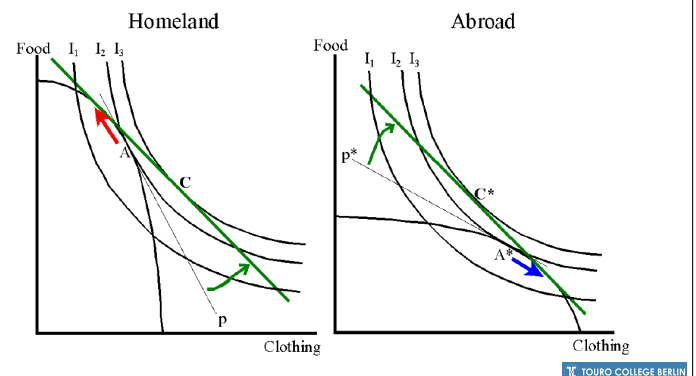
## Identical consumer preferences with unique PPFs implies different price ratios in the two countries

- ▶ The price ratios in each country reflect the different tangencies between the PPFs and the indifference curves.
- ▶ For example, in Homeland supply and demand lead to a higher price of clothing relative to food because the economy's marginal costs of clothing are higher.
- ▶ Different relative costs in Homeland and Abroad means that the two countries can gain from trade.



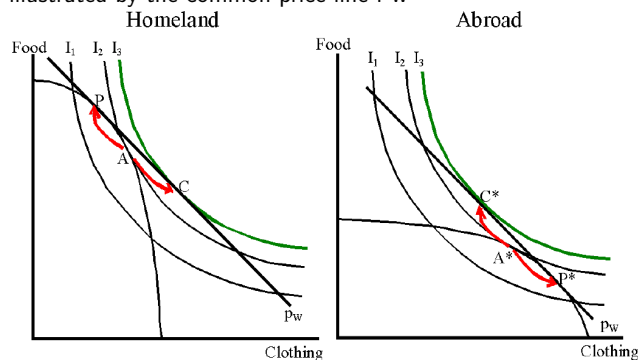
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## Trade between the two large countries will cause each country's relative prices to move in the direction of the other country's relative price ratio



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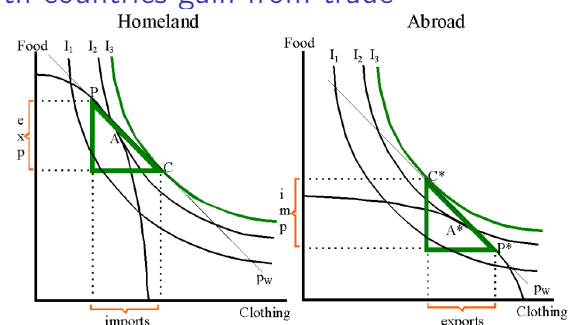
In the absence of barriers to trade or transport costs, trade grows until the price ratios become equal in both countries, as illustrated by the common price line  $P_w$



Production shifts to P and P\*, respectively, and consumption shifts to C and C\* in each country. Welfare rises in both countries

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## Both countries gain from trade



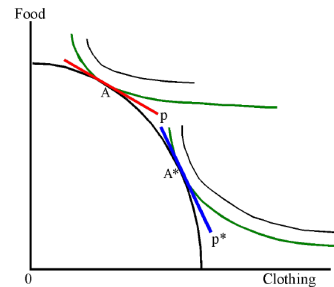
- ▶ Each country reaches a higher indifference curve.
- ▶ Each country specializes in producing products for which it has the lower opportunity costs.
- ▶ One country's exports are the other's imports.
- ▶ Relative prices are equalized across both countries.

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## The Principle of Comparative Advantage

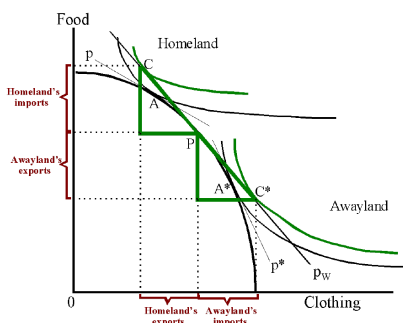
- ▶ Comparative advantage reflects the opportunity costs of production of food and clothing in each economy.
- ▶ Prior to trade, opportunity costs are given by the PPFs at their self-sufficiency equilibria.
- ▶ The two-country, two-product general equilibrium model illustrates comparative advantage because it shows that each country exports the product for which it has the lower opportunity costs.
- ▶ Each country reaches a higher level of welfare by specializing in, and exporting, the good that has the lower opportunity cost.

## Identical PFF with Differences in Tastes



- ▶ Price ratios differ even for the same PPF.
- ▶ The relative prices are now  $p^* > p$ .
- ▶ In the country where consumers have a greater preference for food, production occurs at A.
- ▶ In the country where consumers have a greater preference for clothing, production occurs at A\*.

## Trade with Differences in Tastes



- ▶ If free trade equalizes prices across both countries, each country produces at point P but consumes at different points, C and C\*.
- ▶ Each country will consume more of the product it prefers, exporting the other product in order to acquire more of the product it prefers.

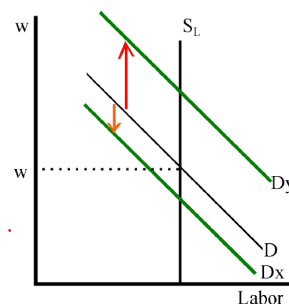
- ▶ The general equilibrium model, in which each industry operates under increasing costs, shows that each country exports the product for which it has the lower opportunity cost.
- ▶ Comparative advantage is determined by the shapes of the PPF and the indifference curves.
- ▶ That is, comparative advantage depends on resource endowments, technology, and consumer preferences.

## Distributional Effects of Free Trade

- ▶ Opening economies to international trade has distributional effects.
- ▶ The adjustment costs themselves are not equally distributed.
- ▶ Some industries expand while others contract, which means only some workers, owners, and regions incur adjustment costs.
- ▶ Other workers, owners, and regions of the country enjoy the economic expansion.
- ▶ Even in the long run and under the assumptions of the HO model, there are permanent distributional effects of switching from restricted to free trade.
- ▶ Once the assumptions of the HO model are altered, many other distributional effects of expanding international trade can be identified.

## Trade and Factor Demand

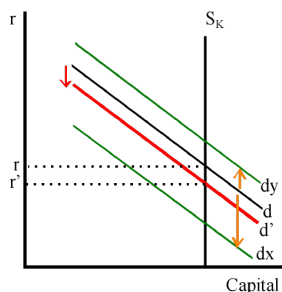
- ▶ Suppose that free trade increases output of Y and decreases output of X and that the Y industry employs relatively more labor than capital than the X industry at given factor prices.
- ▶ The increase in industry Y's output therefore increases demand for labor from D to  $D_y$ .



- ▶ The decrease in industry X's output causes the demand for labor to decline by a smaller proportion from D to  $D_x$ , all other things equal.
- ▶ The effect of industry Y's greatly increased labor demand and industry X's smaller decrease in labor demand is a net increase in overall labor demand.

## Trade and Factor Demand

In the market for capital, the opposite effects occur as a result of the trade's expansion of the Y industry.



- ▶ The effect of the growing industry Y's modestly increased demand for capital and the contracting industry X's larger decrease in demand is a net decrease in overall capital demand from  $d$  to  $d'$ .
- ▶ That is, if trade expands the output of the relatively labor intensive industry, the return to capital decreases.

## The Stolper-Samuelson Theorem

- ▶ When an economy shifts from self-sufficiency to free trade, the real income accruing to the factor used relatively intensively in the growing export industry rises and the real income to the factor used relatively more intensively in the shrinking import-competing industry falls.
- ▶ Not only does the price of abundant factor rise with free trade, but the real value of the income earned by the abundant factor rises.

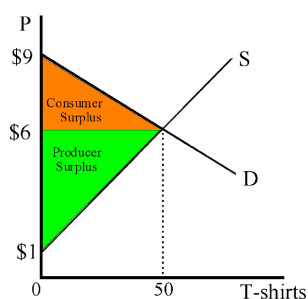
## Partial Equilibrium Models

- ▶ Partial equilibrium models look at just one part of the economy, such as a single market.
- ▶ They make the  $\bar{ceteris\ paribus}$  assumption.
- ▶ This permits them to focus on the details of a single event rather than having to take into consideration all of the related consequences of each event.
- ▶ In international trade we use partial equilibrium models to detail the effects of trade on participants in a single market affected by trade.

## Partial Equilibrium Models

- ▶ We now use an extended two-country partial equilibrium model that still shows the overseas consequences of trade along with the effects in the domestic economy.
- ▶ The model highlights individual markets, which businesses normally focus on.
- ▶ The model also highlights the incentives that drive business decisions, such as prices and competition.
- ▶ The partial equilibrium of trade is compatible with the general equilibrium model of trade even if it does ignore trade's effects beyond the particular market on which it focuses.

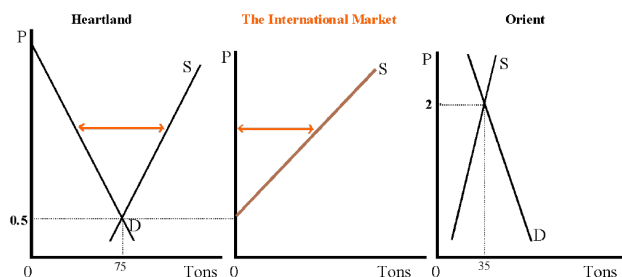
## Welfare Gains from Exchange



- ▶ Consumer surplus: The net gains for consumers of a product, equal to the sum of all marginal gains of each subsequent consumer minus the market price paid for the products
- ▶ Producer surplus: The net gains to producers of a product, equal to the total revenue minus the sum marginal (variable) costs of producing each product.

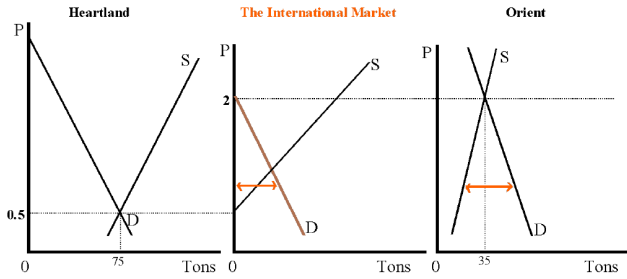
## The Markets for Corn in Heartland and Orient

Heartland's International Supply Curve



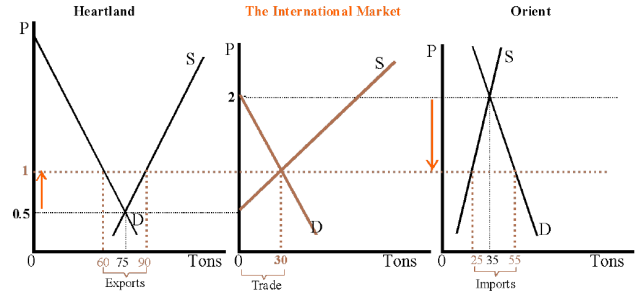
## The Markets for Corn in Heartland and Orient

Orient's International Demand Curve



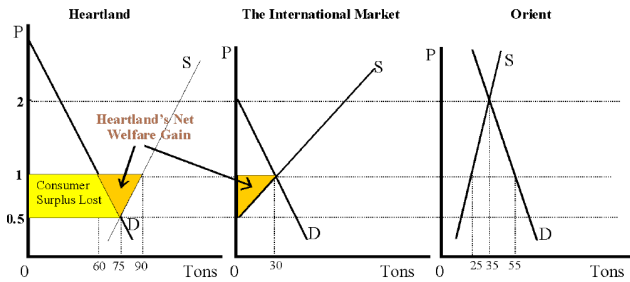
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## Equilibrium in the International Market



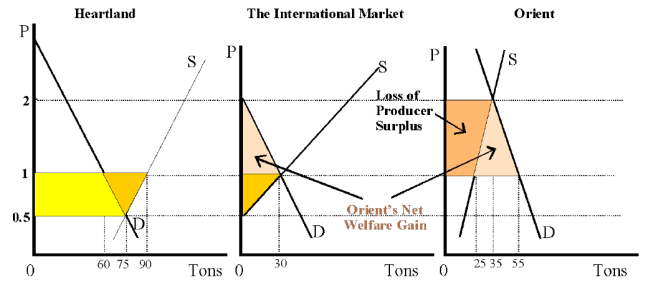
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- ▶ Heartland's producers gain Surplus
- ▶ Heartland's consumers lose Surplus,
- ▶ But Heartland's Net Welfare gain is positive



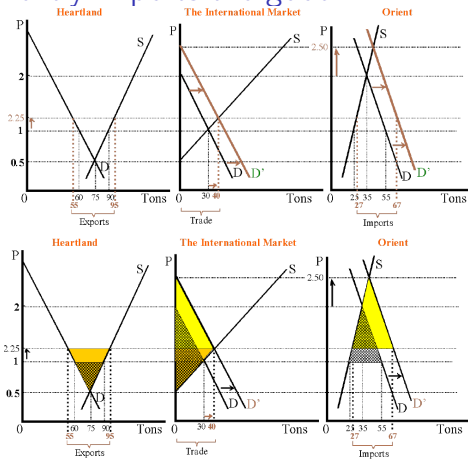
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- ▶ Orient's consumers gain Surplus
- ▶ Orient's producers lose Surplus,
- ▶ But Orient's Net Welfare gain is positive



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## Demand increases in the foreign country that currently imports the good



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- ▶ The partial equilibrium model focuses more directly on the price incentives that consumers and producers face in an open economy and how, in individual markets, those price incentives determine trade flows.
- ▶ The partial equilibrium model also explicitly shows that the expansion of trade creates both gains and losses in individual markets.
- ▶ That is, while there are net gains from trade across all markets in both countries, there are specific interest groups that suffer welfare losses in particular markets.

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