Major Themes in International Economics

+ Review of Microeconomic Concepts

- Major themes in International Economics
- Review of microeconomic concepts
  - Demand, Supply
  - Demand + Supply = Equilibrium
  - Utility Functions
  - Consumption and Income
  - Consumption and Prices
  - Production, Consumption
  - Production + Consumption = Equilibrium
- Trade based on consumption / production differences
- Partial equilibrium analysis of trade
Demand

- **Downward Slope**
  - Individual’s marginal utility
  - Ranking of all people
- Assumes income, other prices, tastes constant
- Shifts vs. movements along curve
- **Price Elasticity**
  \[ \varepsilon_D = \frac{-\%\Delta Q_D}{\%\Delta P} \]
- **Consumer surplus (JGP*)**
  - Max. consumers would pay - actual amount paid
- **Stock & flow demand curves**

Diagram:

- Vertical axis: Price (P, P*)
- Horizontal axis: Quantity (Q)
- Downward sloping demand curve (D)
- Price (P) and Quantity (Q) axes
- Point J
- Point G
- Point D
Supply

- Upward Slope
  - Individual’s marginal cost
  - Ranking of all suppliers
- Assumes technology, factor costs, endowments constant
- Short-run vs. long-run supply curves
- Price Elasticity
  \[ \varepsilon_S = -\frac{\%\Delta Q_s}{\%\Delta P} \]
- Producer surplus (GKP∗)
  - Revenues actually received - marginal production cost
Demand + Supply

- Equilibrium: \( Q \text{ demanded} = Q \text{ supplied} \) at \( P^* \) and \( Q^* \)
- Net increase in welfare due to this market is consumer surplus + producer surplus
- “Shortage” at \( P_A \): \( Q(S) < Q(D) \)
- “Surplus” at \( P_B \): \( Q(S) > Q(D) \)
- Comparative statics: Shift in demand from \( D \) to \( D_1 \)
- Dynamics: How does the market adjust over time from \( (Q^*, P^*) \) to \( (Q_B, P_B) \)?
Utility

- Constant utility along curve
- Ordering: $U_3 > U_2 > U_1$
- Shape: Convex to the origin, need increasing amounts of one good to offset losses in other good
- Slope: $P_A > P_B > P_C$, where $P = \text{Price food / Price cloth}$
- Curves are non-overlapping
- Social utility comparisons
  » Require interpersonal comparisons
  » Compensation principle: gainers compensate losers
Objective: Maximize utility from consumption s.t. budget constraint

Budget constraint: 
\[ X_3 > X_2 > X_1; \text{ rising income} \]

Income elasticity:
\[ \eta = \frac{\%\Delta Q}{\%\Delta \text{Income}} \]

- Inferior goods: \( \text{Inc} \uparrow, \text{Q} \downarrow \)
- Normal goods: \( \eta > 0 \)
- Superior goods: \( \eta > 1 \)

Engel curve: Income expansion path

Trade effects income and therefore consumption
Consumption and Prices

- **Relative price change**
  - from YX to YX₁, food price ↓

- **Price elasticity**
  - Price expansion path: C₀ → C₁; Q₀ → Q₁

- **Income effect**
  - From Q₀ → Q₁ (+ or -)

- **Substitution effect**
  - From Q₀ → Q₀'
    - Almost always +, (except for Giffen goods)

- **International trade effects**
  - prices, and therefore consumption patterns
Production (1 of 2)

✧ Transformation or production possibilities curve (PPC)
  » Full utilization of resources given technology and endowments

✧ Shapes:
  » Constant costs
  » Increasing costs
  » Decreasing costs (not shown)

✧ Slope: \(- \frac{dY}{dX} = \text{price of food in terms of clothing}\)
  » \(P(\text{food})\) higher at \(P_1\)
  » \(P(\text{clothing})\) higher at \(P_2\)
Production (2 of 2)

- **Slope**: \( -\frac{dY}{dX} = \) price of food in terms of clothing
  - = opportunity cost (what you give up of one good to get one unit of another good)
  - = Marginal Rate of Transformation (MRT)

- **Factor growth**
  - Outward shift of PPC
  - Neutral and biased growth

- **Technological change**
  - Outward shift of PPC
  - Neutral and biased change

![Diagram](Good Y: Clothing \[P_2\] Increasing Costs: Both Industries \[P_2\] Constant Costs: Both Industries \[P_1\] Good X: Food)
No trade (autarky) situation

- Production must equal consumption ($P_1 = C_1$)
- This determines the local price of food in terms of clothing ($TOT_1 = \text{terms of trade}$) and utility ($U_1$)

Trading equilibrium

- World prices differ from local prices (assume $TOT_1 < TOT_2 \Rightarrow \text{price of clothing} \uparrow$)
- Country produces more clothing, less food, and trades clothing for food
Trade triangle:
» Exports of cloth = $P_2 - C_2$
» Imports of food = $C_2 - P_2$

Trade allows country to reach higher level of utility $U_2 > U_1$

Pareto Optimality
» MRT (in production) = MRS (in consumption) = TOT (relative prices)
» No marginal changes in production or consumption can further improve welfare
Two Sources of Pre-Trade Price Differentials

(1) Production differences, tastes identical

- Production possibilities in countries A and B differ ($T_A \neq T_B$)
- Assume A & B have identical tastes, for both utility is $U_1$
- Pre-trade ($P=C$):
  - Country A at $P_A$
  - Country B at $P_B$
- After trade, A & B face common world prices (TOT)
  - Production diverges
  - Consumption converges
- After trade, utility $\uparrow$ to $U_2$
Two Sources of Pre-Trade Price Differentials
(2) Production identical, tastes different

- Production possibilities in countries A and B identical ($T_A = T_B = T$)
- Assume tastes in A & B differ ($U_A \neq U_B$)
- Pre-trade ($P=C$):
  - Country A at $P_A$
  - Country B at $P_B$
- After trade, A & B face common world prices (TOT)
  - Production converges
  - Consumption diverges
- After trade, utility $\uparrow$, $U_A^*$, $U_B^*$
Four essential questions about international trade

» Why do countries trade? What factors determine what a country exports and imports?
» How does trade effect production and consumption in each country?
» How does trade effect welfare in each country? In what sense is it correct to say that a country gains or loses through trade?
» How does trade effect the distribution of income or well-being across groups? Can we identify groups that gain or lose because of trade?
Partial Equilibrium Analysis: The Effects of Trade on Production, Consumption and Prices of Cloth

- Pre-trade, price of cloth is high in U.S. (2.0) and low in ROW (2/3)
- International trade establishes a single world price
- In U.S. cloth demand ↑, production ↓; in ROW cloth demand ↓, production ↑
Partial Equilibrium Analysis: Welfare Effects on Producers, Consumers, and the Nation as Whole from Trade in Cloth (U.S. View)

Gains from international trade in wheat and cloth

<table>
<thead>
<tr>
<th>Group</th>
<th>No international trade</th>
<th>With international trade</th>
<th>Net gain from trade</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. cloth consumers</td>
<td>c</td>
<td>a + b + c + d</td>
<td>a + b + d</td>
</tr>
<tr>
<td>U.S. cloth producers</td>
<td>a + e</td>
<td></td>
<td>- a</td>
</tr>
<tr>
<td>U.S. as a whole</td>
<td>c + a + e</td>
<td>a + b + c + d + e</td>
<td>b + d</td>
</tr>
</tbody>
</table>

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Partial Equilibrium Analysis:
Welfare Effects on Producers, Consumers, and the Nation as Whole from Trade in Cloth (ROW view)

Gains from international trade in wheat and cloth

<table>
<thead>
<tr>
<th>Group</th>
<th>Net gain from trade</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROW cloth consumers</td>
<td>- (j + k) [a loss]</td>
</tr>
<tr>
<td>ROW cloth producers</td>
<td>j + k + n</td>
</tr>
<tr>
<td>ROW as a whole</td>
<td>n</td>
</tr>
</tbody>
</table>

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### Partial Equilibrium Analysis: Welfare Effects of Trade in Cloth & Wheat

<table>
<thead>
<tr>
<th></th>
<th>Cloth</th>
<th>Wheat</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>U.S.</strong></td>
<td>Consumers +</td>
<td>Consumers -</td>
</tr>
<tr>
<td></td>
<td>Producers -</td>
<td>Producers +</td>
</tr>
<tr>
<td><strong>R.O.W.</strong></td>
<td>Consumers -</td>
<td>Consumers +</td>
</tr>
<tr>
<td></td>
<td>Producers +</td>
<td>Producers -</td>
</tr>
</tbody>
</table>

- U.S. - Cloth consumers better offers, producers worse off
- R.O.W. - Cloth consumers worse off, producers better off
- Welfare effects are the opposite in the wheat industry
- All can benefit from trade, when gainers compensate losers
The Four Trade Questions: Early Answers

🔹 Why do countries trade?
  » Before trade, differences in demand and supply conditions lead to prices differences across countries

🔹 How does trade effect production and consumption?
  » Opening up trade results in a single world price
  » Production expands in the exporting country
  » Consumption expands in the importing country

🔹 Which countries gain from trade?
  » Both countries gain, in proportion to the price change from no trade to free trade (See next slide)

🔹 Within a country, who gains, who loses from trade?
  » Gainers: Export producers & Import consumers
  » Losers: Import producers & export consumers
Computing the net gains from trade

The formula for triangle \( d \) on slides 16 & 17 is:

- \( d = 1/2 \times \text{base} \times \text{height} = 1/2 \left( D_1 - D_0 \right) \left( P_0 - P_1 \right) \)
- Recall that price elasticity of demand is:
  \[ \varepsilon_D = \frac{-\% \Delta Q_D}{\% \Delta P} = \frac{D_1 - D_0}{P_0 - P_1} \]
  \[ \frac{P_0}{D_0} \]
  so, \( D_1 - D_0 = \varepsilon_D (P_0 - P_1) \times \frac{D_0}{P_0} \)
- Let \( \tau = \% \text{ price change} = \frac{P_1 - P_0}{P_0} \)
  so, \( P_0 - P_1 = -\tau P_0 \)
- By substitution, \( d = 1/2 \varepsilon_D \tau^2 D_0 P_0 \)

The formula for triangle \( b \): \( b = 1/2 \varepsilon_S \tau^2 D_0 P_0 \)
where \( \varepsilon_S \) is price elasticity of supply

The formula for triangle \( b + d \): \( b+d = 1/2 \varepsilon_M \tau^2 M P_0 \)
where \( \varepsilon_M \) is price elasticity of demand for imports, \( M = \text{imports} \)