

# *Chapter 3*

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## *Comparative Advantage and the Gains from Trade*

# Why do we trade?

- *The classical theory of trade is concerned with the following 3 questions*
  1. What are the **gains from trade**? In other words, if countries benefit from international trade, where do the gains come from, and how are they divided among trading countries?
  2. What is the **structure/pattern of trade**? In other words, (a) which goods/services are exported, and which are imported? (b) What are the fundamental laws that govern international allocation of resources and flow of trade?
  3. What are the **terms of trade**? That is, at what prices are the exported and imported goods exchanged? Nations (or firms in different countries) trade with each other because they benefit from it.
- **Free trade supporting theories: show that specialization of production and free flow of goods grow all trading partner's economies.**

# Early Theories – 4 categories

- 1. **Early Trade Theory: Mercantilists:** Purpose underpin an **us** versus **them** view of Trade: other country's gain is our country's loss.
- Until mid-18<sup>th</sup> century, belief that the purpose of international trade as to keep exports greater than imports and pile up GOLD, and when /if deficits were created they believed that imports had to be restricted. Mercantilists assumed trade to be a zero-sum game since it was assumed that fixed amounts of goods and of gold existed in the world and that trade merely determined their distribution among various nations.
- Maximize exports and minimize imports: no advantage in trade.
- Government intervenes to achieve surplus in exports: **Supporters** (King, exporters, domestic producers): Anti-Mercantilists (citizens --- domestic goods were expensive and of limited variety).
- Today neo-mercantilists = protectionists: some segments of society shielded in the short-term. **Zero-sum Vs positive-sum game view of trade.**

# Mercantilist Theory

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- **Core Propositions of Mercantilist Theory**
  - Wealth is an absolutely essential means to power, whether for security or for aggression;
  - Power is essential or valuable as a means to the acquisition or retention of wealth;
  - Wealth and power are each proper ultimate ends of national policy; and
  - There is a long-run harmony between these ends.

# Trade Theories (continued)

- 2. Classical Trade Theory: (a) Absolute Advantage (Adam Smith, 1776) and Comparative Advantage (David Ricardo, 1817). **Purpose:** explain national economy conditions-country advantages – that enable such exchange to take place.
- **Absolute Advantage** (Adam Smith: *The Wealth of Nations*, 1776)
- Access to foreign markets helps create wealth
  - If no nation imports, every company will be limited by the **size of its home country market**
  - More importantly, the macro division of labor will be limited by the extent of the market
  - Imports enable a country to obtain goods that it cannot make itself or can make only at very high costs
  - **Trade barriers decrease the size of the potential market**, hampering the prospects of specialization, technological progress, mutually beneficial exchange, and, ultimately, wealth creation.

# Comparative Advantage

- Mercantilism weakens a country in the long-run and enriches only a few segments
- A country should specialize in and export products for which it has an Absolute Advantage; import others.
- A country has an Absolute Advantage **when it is more productive than an other country in producing a particular product.**
- **Comparative Advantage** (David Ricardo: *Principals of Political Economy*, 1817)
- Country should specialize in the production of those goods in which it is relatively more productive ---- even if it has absolute advantage in all goods it produces.
- Absolute advantage is really a **special case** of comparative advantage.

# Theories (Continued)

- **3. Modern Trade Theory** (redefined free trade, Heckscher-Ohlin, 1919 –
- Factor Proportions (Chapter 4&5) and International Product Life-Cycle (Ray Vernon; 1966)
- International Product Cycle (Vernon)
- Most products initially conceived and produced in the US in the 20<sup>th</sup> century
- US firms kept production close to the market (aids decisions; minimizes risk of new product innovations; demand not yet based on price; low production not an issue)
- Limited initial demand in other advanced countries– exports more attractive than production there initially

# Theories contd

- With demand increase in advanced countries, production there follows
- With demand expansion elsewhere, product becomes standardized; production moves to low production cost areas; production now imported to the US and to advanced countries.
- **4. New Trade Theories** (post 1980s)
- In many industries, as output expands with specialization, the ability to realize economies of scale increases and unit costs decrease.
- Because of such scale economies, world demand supports only a few firms in such industries (e.g. commercial aircraft, autos)
- Countries that had an early entrant to such an industry have an advantage in such an industry; first mover advantage and barriers to entry (Airbus overcame through government subsidies)
- **Global Strategic Rivalry**: firms gain competitive advantage through: intellectual property, R&D. economies of scale and scope, experience [Porter, 1990]



# Ricardian Model of Production and Trade

- Named after David Ricardo (1772-1823)
- **Assumptions:**
  - There are two countries producing two goods and using one input (labor)
  - **Markets are competitive:** firms are price takers
  - **Static world:** technology is constant and there are no **learning effects**
  - **Labor is perfectly mobile:** it can easily move back and forth between industries
- **Ricardian Model: Absolute Productivity Advantage**
- **Productivity** – the amount of output obtained from a unit of input
- **Labor productivity**– (output)/(hours worked)
  - If two loaves of bread can be produced in 1 hour, productivity = (2 loaves) / (1 hour)
  - Similarly, suppose productivity in steel is given as (3 tons) / (1 hour).
- **Absolute productivity advantage** – held by a country that produces more of a certain good per hour worked than another.

# Absolute Productivity Advantage

TABLE 3.1

Output per Hour Worked

	<i>U.S.</i>	<i>Canada</i>
<b>Bread</b>	2 loaves	3 loaves
<b>Steel</b>	3 tons	1 ton

Canada is more productive than the United States in bread production, but the United States is more productive at steel production.

Note: Canada has **absolute advantage in bread (B)**  
US has **absolute advantage in steel (S)**

# Opportunity Cost Calculation

- The U.S. **opportunity cost** of steel is 2/3 loaf of bread: each unit of steel produced requires the U.S. economy to forfeit the production of 2/3 loaf of bread.
- Thus, the **bread price of steel in the US** is:

$$P_S^{US} = \frac{2 \text{ Loaves}}{3 \text{ Tons}} = .6 \left( \frac{\text{Loaves}}{\text{Ton}} \right).$$

The US: The cost of **1 unit of steel** in terms of bread is **0.67**

# Opportunity Cost Calculation

- By the same logic, the **Canadian opportunity cost** of steel is 3 loaves of bread.
- That is, **the bread price of steel in Canada** is:

$$P_S^{Can} = \frac{3 \text{ Loaves}}{1 \text{ Ton}} = 3 \left( \frac{\text{Loaves}}{\text{Ton}} \right).$$

**The US:** The cost of **1 unit of steel** in terms of bread is **0.67**

**Canada :** The cost of **1 unit of steel** in terms of bread is **3**

## Absolute Advantage and Trade (cont)

- Trade between the US and Canada, in this example, will occur at a price between these limits:

$$P_S^{Can} = 3 \left( \frac{\text{Loaves}}{\text{Ton}} \right) > .6 \left( \frac{\text{Loaves}}{\text{Ton}} \right) = P_S^{US} .$$

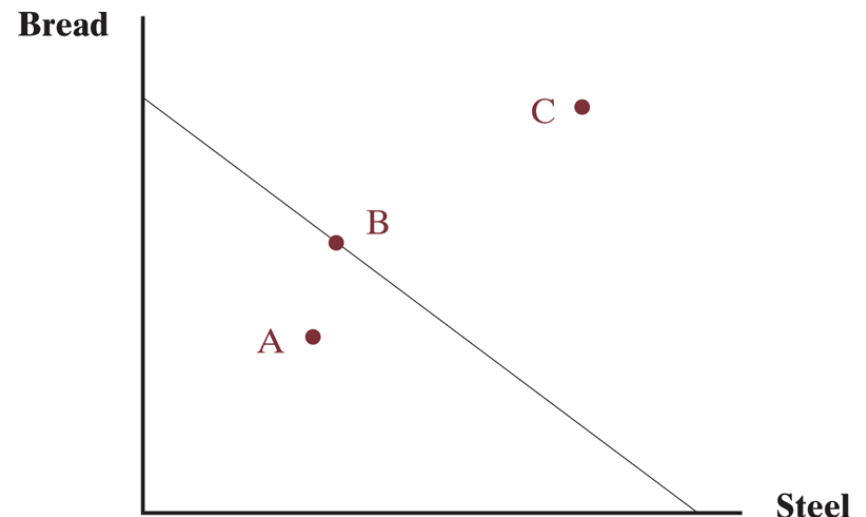
- That is, the trading price (PT) must be such that
- [Canada] 3.00 > PT > 0.67 [US]
- Note** that the steel price of bread is just the inverse of the bread price of steel.

# Comparative Productivity Advantage and Gains from Trade

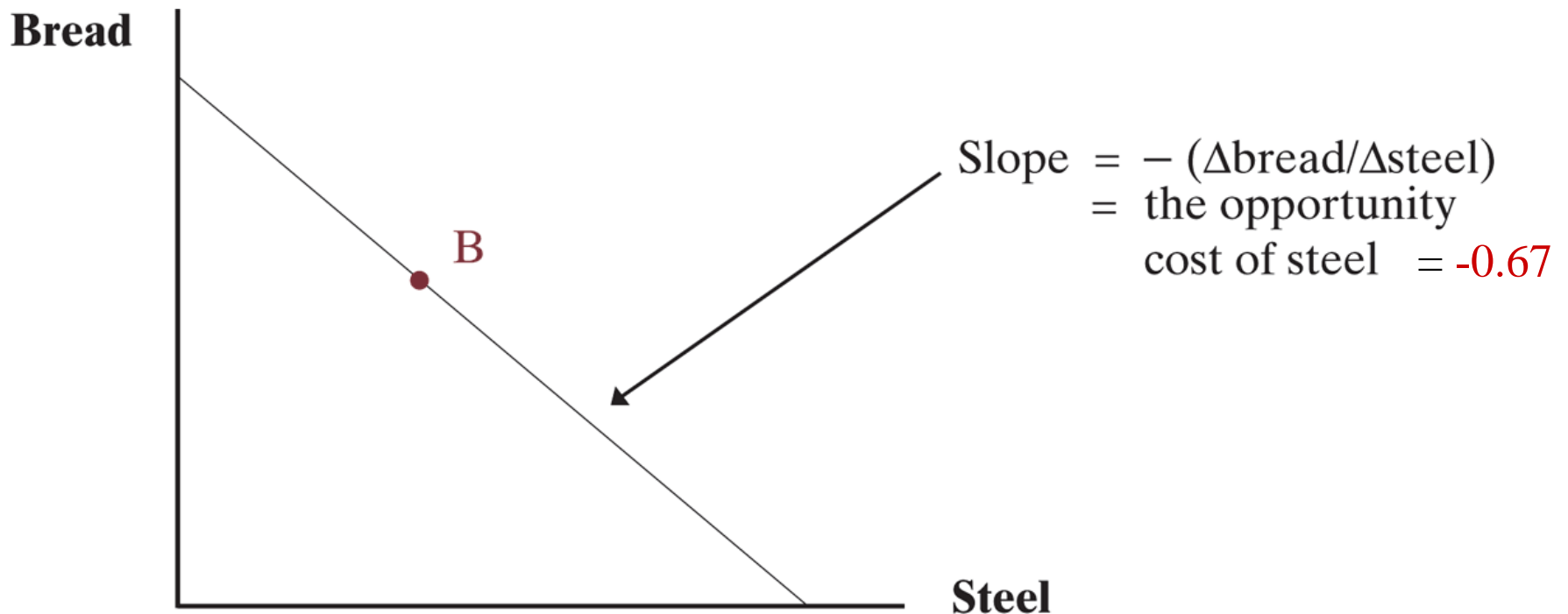
- **Question:** What happens to a country that does not have **absolute productivity advantage** in anything?
- **Answer:** Even if a country does not have any goods with an absolute productivity advantage, it can benefit from trade.
  - The idea that nations benefit from trade has nothing to do with whether a country has an absolute advantage in producing a particular good.

# FIGURE 3.1 The United States' Production Possibilities Curve

- Shows the tradeoffs a country faces when choosing its combination of **bread** and **steel** output
- B on the PPC is an efficient point of production: resources are utilized to obtain the maximum possible level of output



## FIGURE 3.2 Opportunity Costs and the Slope of the PPC





# What Determines the Slope of the PPC? (cont.)?

- The **Slope of the PPC** is -0.67: the number of loaves of bread forgone divided by the quantity of steel obtained
- **Relative Prices**
- Without trade, the U.S. would forgo 0.67 loaves of bread for an additional ton of steel. This is the **opportunity cost** of steel, or the **relative price** of steel
- Why **relative price**? Because the price is not in monetary units but in units of the other good
  - **Relative price of steel is the inverse of the price of bread: if 0.67 loaves of bread is the price of a ton of steel in the U.S., then  $= 3/2 = 1.5$  tons of steel is the price of one loaf of bread**

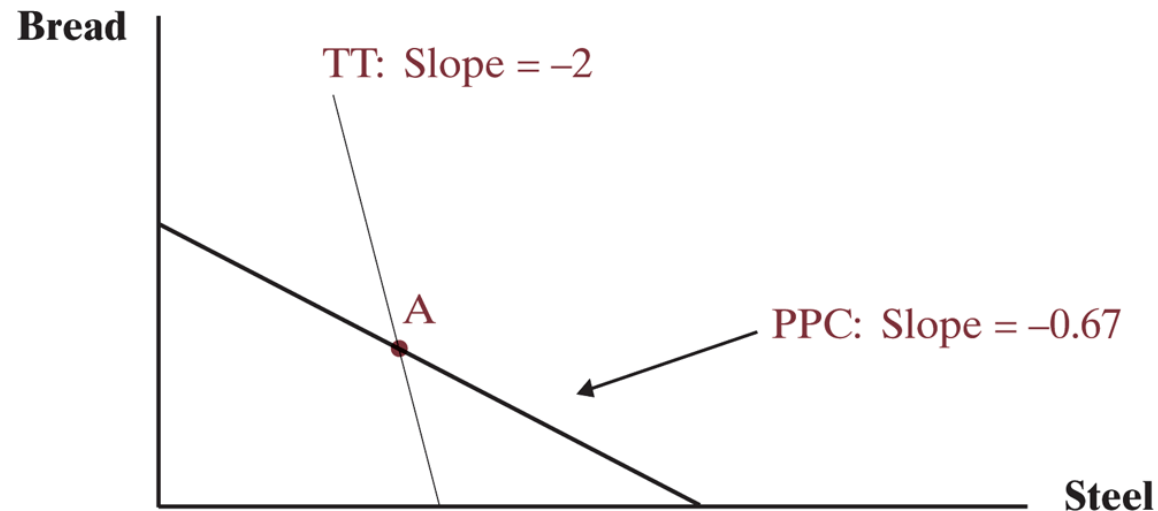
# Autarky versus Trade

- **Autarky:** complete absence of trade; all nations can only consume the goods they produce at home
- Trade allows countries to raise their consumption and
  - If the opportunity cost of steel in Canada is 3 loaves of bread per ton, and in the U.S. 0.67 loaves per ton, both countries can consume more by trading
  - Price of steel would have to settle somewhere between the opportunity costs in Canada and the U.S.

$$3.0 \text{ (loaves/ton)} > P_w^s > 0.67 \text{ (loaves/ton)}$$

## FIGURE 3.3 Production and Trade Before Specialization

- Let the price of bread settle at 2 loaves per ton of steel.
- U.S. trading possibilities are illustrated by the price line or the trade line (TT) with a slope of -2

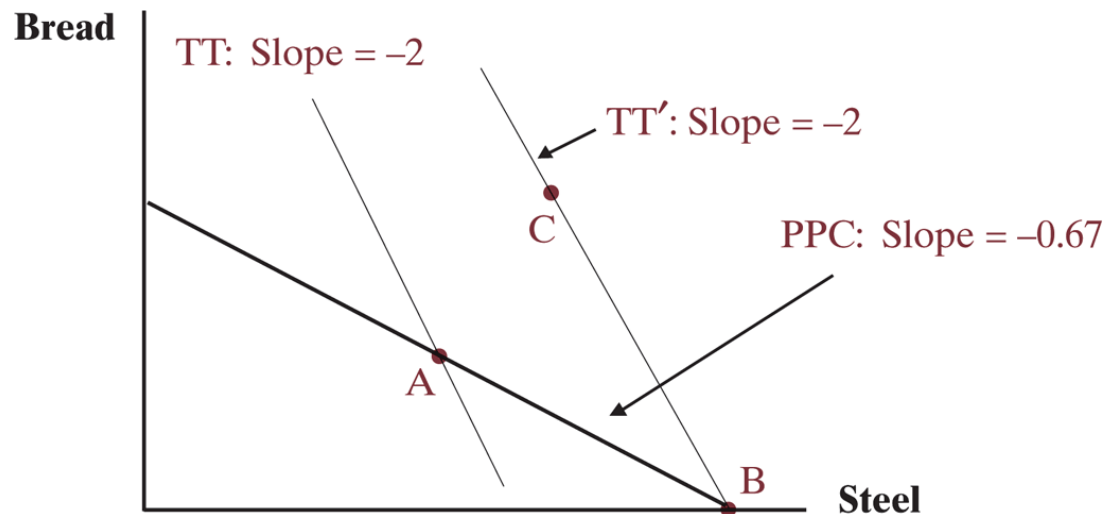


A = the combination of steel and bread available for trade

# FIGURE 3.4

## Production to Maximize Income

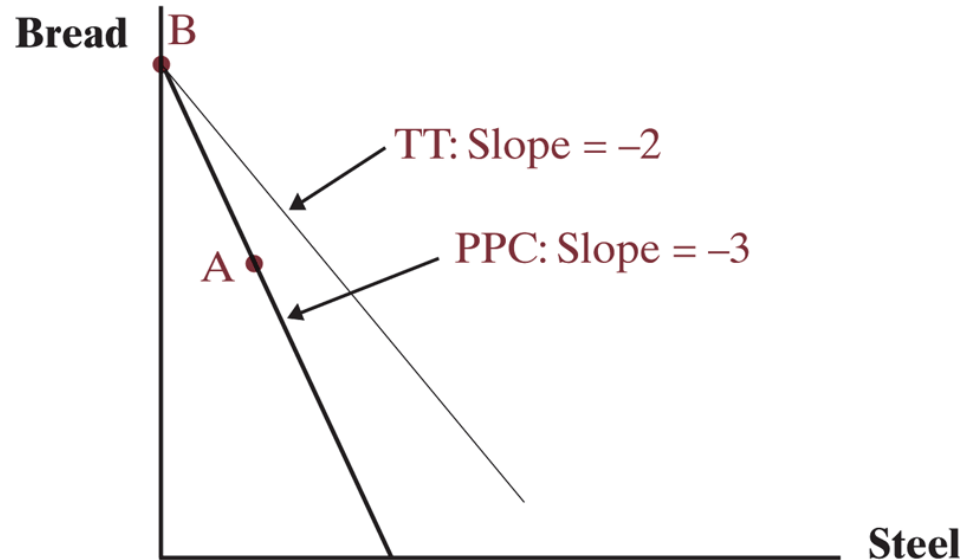
- By specializing in the production of steel and trading steel for bread, the U.S. receives gains from trade and can increase its consumption



C = the consumption bundle the U.S. obtains by producing at B, or by specializing in steel and trading for bread. **Note:** parallel lines imply identical prices.

## FIGURE 3.5 Canada's Gains from Trade

- Conversely, Canada, by specializing in the production of bread and trading for steel, can also increase its consumption



# The Gains from Trade U.S. and Canada

- In sum, suppose the relative price of steel is 2 loaves of bread
  - When the U.S. increases steel output by 1 ton, it gives up 0.67 loaves of bread output; however, it can now trade the steel for 2 loaves, leaving a **net gain** of 1.33 loaves ( $2 - 0.67 = 1.33$ )
  - To meet U.S. demand for 2 more loaves of bread, Canada gives up 0.67 tons of steel output; however, it can now trade 2 loaves for 1 ton of steel, leaving a **net gain** of 0.33 tons ( $1 - 0.67 = 0.33$ )

# Domestic Prices and the Trade Price

- How to make sure that the trade price settles within

$$3.0(\text{loaves/ton}) > P_w^S > 0.67(\text{loaves/ton}) ?$$

- If the trade price was 4 loaves of bread [closer to the US position], both countries would specialize in steel. However, the consequent bread shortage and steel glut would increase the price of bread and decrease the price of steel; once the price of bread fell to less than 3.0, Canadian producers would switch back to bread.
- If trade price is closer to 0.67 [closer to the Canadian], gains are larger for Canada; if it is closer to 3.0, gains are larger for the U.S.; however, both would gain from trade when the price falls in this range.

# Absolute versus Comparative Productivity Advantage

- **Absolute productivity advantage:** held by a country that produces more of a certain good per hour worked than another
- **Comparative productivity advantage** (or **comparative advantage**): held by a country that has lower opportunity costs of producing a good than its trading partners do
- **Comparative advantage allows a country that lacks absolute advantage to sell its products abroad**



# Comparative Advantage in Sum

- Comparative advantage allows gains from trade to occur
- However, when a nation moves along its PPC toward a new mix of industries to exploit its comparative advantage, **the transition period may hurt some**
- **Economic restructuring** caused by trade opening produces higher living standards; however, in the short-term, restructuring is often costly

# Gains from Trade

- For the small economy, **free trade welfare-dominates any other policy.**
- What have we ignored:
  - Large countries
  - Market imperfections
  - Adjustment costs

# Gains from Trade for a Small Economy: Autarky versus Trade

- **Autarky** – complete absence of trade; the feasible consumption set is equal to the production set.
- A *small economy* has no effect on world prices.
- **Gains from Free Trade:**
  - Trade at world prices permits a consumption set that lies strictly outside the autarky consumption set at all points except the specialization point.
  - As long as consumers prefer to consume some positive amount of both goods, trade must raise aggregate welfare.

# Large Country Gains from Trade

- Free trade cannot be worse than autarky for the large country.
  - As long as the autarky price and the post trade prices are different, the logic is as above.
- However, **some level of protection will generally be welfare superior to free trade.**
  - Straightforward if trading partner is small.
  - Trade war possible if trading partner is large.

# Market Imperfections and the Gains from Trade

- There are a variety of ways in which real economies deviate from perfect competition
  - *Product Market Imperfection*: Monopoly, Oligopoly, Monopolistic Competition
  - *Factor Market Imperfection*: Unions, Long-term contracts
  - *Externalities*: Positive and Negative
  - *Increasing Returns to Scale*

# Market Imperfections (continued)

- Market imperfections may justify policy intervention
  - Trade policy is usually not the preferred intervention; but
  - *In theory*, correctly applied trade policy might be welfare increasing.
- We return to these issues later.

# Adjustment Costs and the Gains from Trade

- The argument we have made to this point considers only the long-run.
- People that must shift jobs will generally experience costs
  - Direct relocation costs
  - Spells of unemployment and reduced wages
- These costs must be considered
  - This will reduce the total gains;
  - Redistribution must be made for a Pareto improvement.

# Economic Restructuring

- **Economic restructuring:** changes in the economy that may require some industries to grow and others to shrink or disappear
  - In the Ricardian model, trade opening moved labor from bread to steel production: restructuring improved U.S. overall economic welfare but made its bread industry disappear
  - If trade results in net gain (in an increase of the consumption bundle), a country will be better off by trading; however, some sectors may still lose



# Response to Adjustment Costs

- Given that some lose due to economic restructuring, the government can seek to get winners from trade and restructuring to compensate the losers
  - **Trade adjustment assistance** (TAA) helps losers by providing extended unemployment benefits, worker retraining, and temporary tax on imports
  - For example, the U.S. government created a special program for workers laid off because of NAFTA; in 1994, 17,000 workers qualified for the program

# The Future of the Tensions

- Two views about the tension between civic and social groups on the one hand, and governments in international institutions, on the other:
  - *Pessimistic*: the tension will roll back the international integration achieved over the past several decades
  - *Optimistic*: the tension will lead to increasing participation by civic and social groups in decision-making in international institutions, which will produce better policies and allow more people enjoy the benefits of globalization