

Econ 340

Lecture 4

Modern Theories and Additional Effects of Trade

Outline

- Sources of Comparative Advantage
- The Heckscher-Ohlin Model
 - Main Idea
 - Intuition
 - Does the Theory Work?
- Effects of Trade
 - Changes in Production
 - Factor Price Equalization
- The New Trade Theory
 - Assumptions
 - Implications
- The New New Trade Theory

Sources of Comparative Advantage

- What determines comparative advantage?
- Answer: Many things

- **Definition: Comparative Advantage** is
 - a low price for a good,
 - in autarky,
 - relative to other goods
 - compared to other countries.

Double comparison

Sources of Comparative Advantage

- Factor Proportions

This will be the most important

We'll come back to it in a moment

Sources of Comparative Advantage

- Technology
 - This is associated with Ricardo and the Ricardian model we looked at last time
 - Technological advantage → exports
 - Advantage may be eroded over time by
 - Technology transfer to other countries
 - Multinational companies that use technology abroad
 - Technical progress that makes earlier innovations obsolete

Sources of Comparative Advantage

- Demand
 - High demand for a fixed available quantity leads to
High price, leads to
Comparative Disadvantage
Thus imports

Sources of Comparative Advantage

- Scale Economies (i.e., Increasing Returns to Scale)
 - Definition: Average cost falls as output rises
 - Leads to lower cost for large countries
 - Problem: scale economies also lead to large firms, and therefore imperfect competition
(We'll deal with this later today, under "New Trade Theory")

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The Heckscher-Ohlin Model

- The Factor Proportions Model
 - Also called Heckscher-Ohlin Model
 - Due to
 - Eli Heckscher (1879-1952),
 - Bertil Ohlin (1899-1979), and
 - Paul Samuelson (1915-2009)

The Heckscher-Ohlin Model

- The Factor Proportions Model
 - Main idea:

- Comparative advantage is determined by
 - Factor endowments of countries, together with
 - Factor intensities of industries

The Heckscher-Ohlin Model

Two differences drive trade in H-O Model

1. Countries differ in endowments of factors
2. Industries differ in factor intensities

The Heckscher-Ohlin Model

Two differences drive trade in H-O Model

1. Countries differ in endowments of factors
 - Labor
 - Capital
 - Land
 - Skill (Human capital)
 - Resources
2. Industries differ in factor intensities

The Heckscher-Ohlin Model

1. Countries differ in endowments of factors
2. Industries differ in factor intensities

Examples:

- Agriculture uses lots of land
- Textiles & apparel use lots of unskilled labor
- Autos use lots of capital
- Computers use lots of human capital

The Heckscher-Ohlin Model

Implication of #1 and #2:

Heckscher-Ohlin Theorem:

Countries have comparative advantage in,
and therefore export,
goods that use relatively intensively
their relatively abundant factors

The Heckscher-Ohlin Model

Implication of #1 and #2:

Heckscher-Ohlin Theorem:

- Countries have comparative advantage in,
- and therefore export,
- goods that use relatively intensively
- their relatively abundant factors

The Heckscher-Ohlin Model

- Intuition
 - Abundant factors are cheap (in autarky)
 - Cheap factors produce cheap goods
 - Hence comparative advantage
- Crucial for the model:
 - Factors (labor, capital, etc.) are perfectly mobile within a country across industries
 - Thus all labor in a country is paid the same wage – wages, etc., do not differ by industry

Many of you will forget this on exams, when I ask what happens to wages in one industry or another.

Modern Theories

The Heckscher-Ohlin Model

- Does the H-O Theory Work Empirically?
 - Evidence against
 - Leontief Scarce Factor Paradox
 - In early 1950s, Wassily Leontief (1906-1999) measured capital (K) and labor (L) in US exports (X) and imports (M).

Found:

Paradox,
since US
was
thought to
have
abundant
capital

$$\left(\frac{K_X}{L_X} \right)_{\text{exports}}^{\text{US}} < \left(\frac{K_M}{L_M} \right)_{\text{imports}}^{\text{US}}$$



- More recent studies have been mixed.

The Heckscher-Ohlin Model

- Does the H-O Theory Work?
 - Evidence in favor
 - US exports agricultural goods and high-tech goods, intensive users of our abundant land and human capital
 - Developing countries export textiles and apparel, intensive in unskilled labor
 - Most recent studies have found increasing evidence that trade patterns do depend on
 - Factor proportions, as the H-O theory says,
 - But also on differences in technology
 - Conclusion:
 - H-O theory is an important part of the story,
 - But it is not the whole story

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Effects of Trade

(according to H-O Theory)

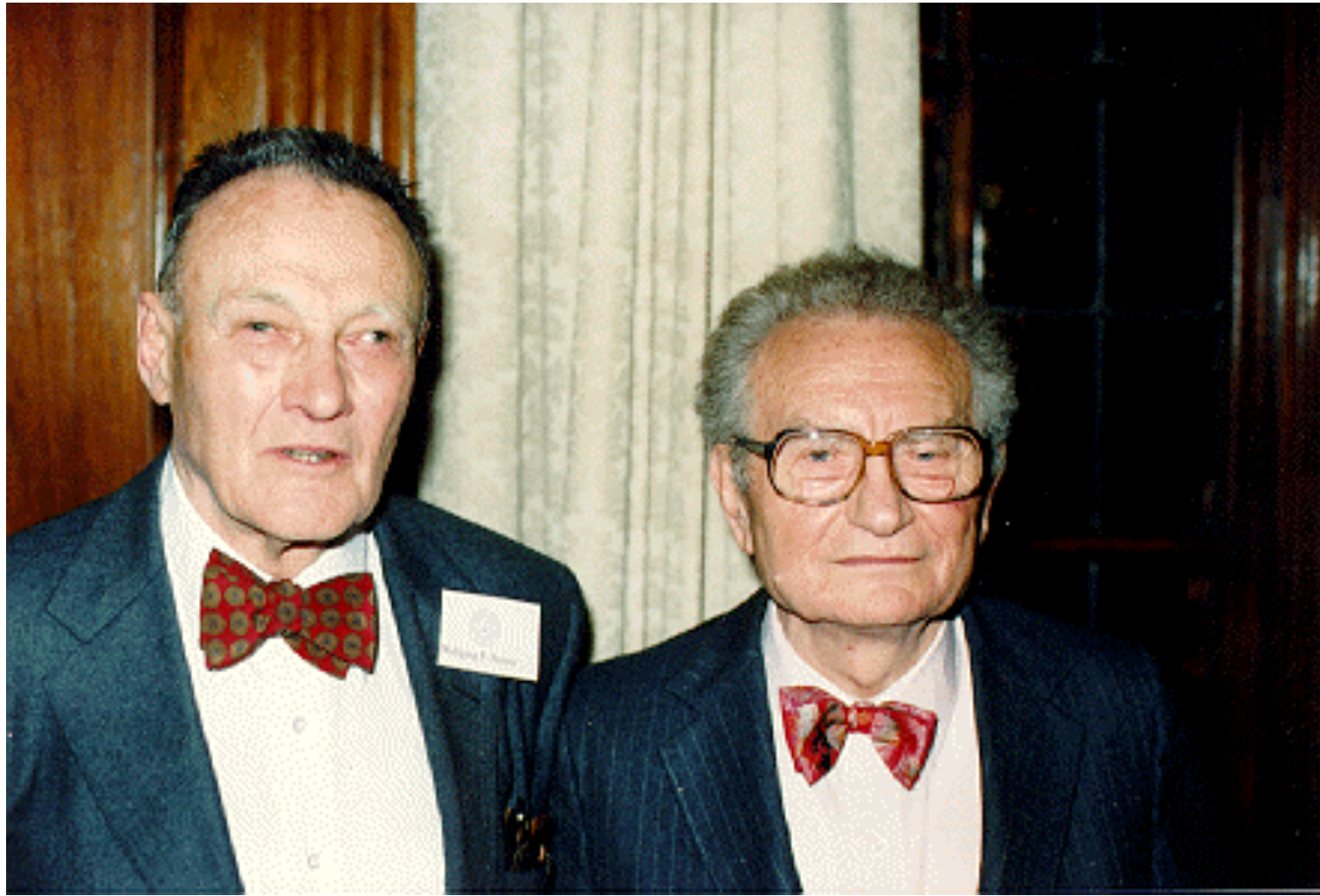
- Trade causes:
 - Production: of export good ↗
of import good ↘
 - Factors (labor, capital, etc.) to move industries:
→ toward export sector
 - Industries expand, contract, or may disappear
(as in Ricardian model)
 - Factor demands: for abundant factor ↗
for scarce factor ↘
 - Factor prices: of abundant factor ↗
of scarce factor ↘

Effects of Trade (according to H-O Theory)

- Two important implications for factor prices:
 - Factor Price Equalization
 - Trade causes prices of factors in different countries to move together, even to become equal across countries
 - Stolper-Samuelson Theorem
 - Real price (i.e., wage in terms of goods it can buy) of a country's abundant factor rises due to trade
 - Real price (wage) of its scarce factor falls

NOTE: This means that there are losers from trade: the owners of a country's scarce factor.
(In the US, that is (unskilled) labor)

Wolfgang Stolper and Paul Samuelson



Effects of Trade

(according to H-O Theory)

- Implications of the Stolper-Samuelson Theorem
 - See Bivens
 - If the Stolper-Samuelson Theory is right for the US, then labor loses from trade
 - That's a lot of people, perhaps a majority of the population
 - Though really it is only low-skilled labor that loses, which is fewer
 - And it implies increased inequality
 - True even more so with only the low-skilled being hurt

Effects of Trade (according to H-O Theory)

- Implications of the Stolper-Samuelson Theorem
 - What should we do about it?
 - Bivens, though himself a critic of trade, does not say to restrict trade
 - He advocates other policies to redistribute income toward low-wage workers
 - large-scale social insurance programs
 - universal health care
 - stable pension income
 - disability and life insurance
 - lifetime of access to high-quality public education

Clicker Question

In the Heckscher-Ohlin Model, what would cause a country to import the capital-intensive good?

- a) The country is small
- b) The country is large
- ✓ c) The country has relatively little capital
- d) The country has relatively a lot of capital

Clicker Question

If a country that is relatively labor-abundant opens to trade, what will happen to the real wage in the Heckscher-Ohlin Model?

- ✓ a) Rise
- b) Fall
- c) Remain unchanged
- d) It's not possible to tell

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The New Trade Theory

- New Trade Theory
 - Developed in the early 1980s
 - Most prominent contributor was Paul Krugman, now a New York Times columnist
 - Won Nobel Prize 2008



The New Trade Theory

- Assumptions of the New Trade Theory
One or more of
 - Increasing returns to scale
 - Imperfect competition
 - Monopoly (one seller)
 - Oligopoly (few sellers)
 - Monopolistic competition (many sellers, but each with some market power)
 - Product differentiation
- None of these were allowed in the Ricardian and H-O Models

The New Trade Theory

- Implications of the New Trade Theory
 1. Countries may export the same good to each other
 2. Countries may lose from trade
 3. More and broader reasons for countries to gain from trade
 4. New rationales for using policy to affect trade

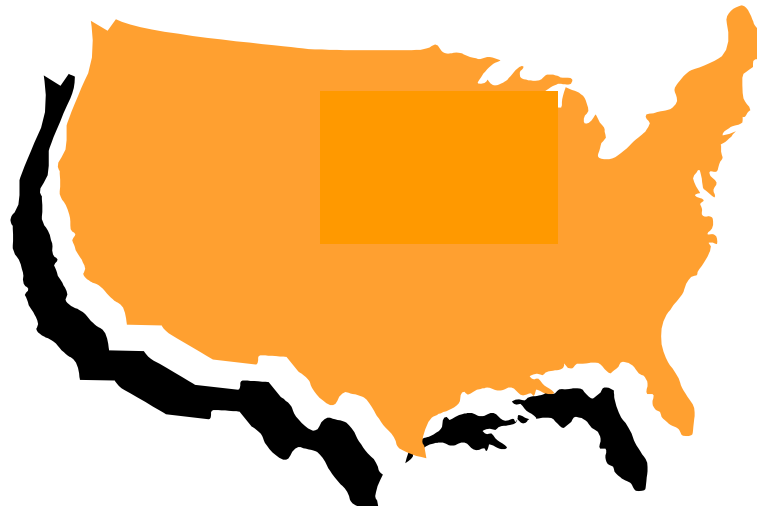
More on each of these...

The New Trade Theory

1. Countries may export the same good to each other
 - This is called Intra-Industry Trade (IIT)
 - Example: US both exports and imports cars

The New Trade Theory

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The New Trade Theory

- Explanations for IIT
 - Definitions of “industry” may be too large, and include
 - Different, but similar, products
 - Toyotas 
 - Fords 
 - Goods at different stages of processing
 - Autos 
 - Auto parts 

The New Trade Theory

- Explanations for IIT
 - Same good sold across different borders

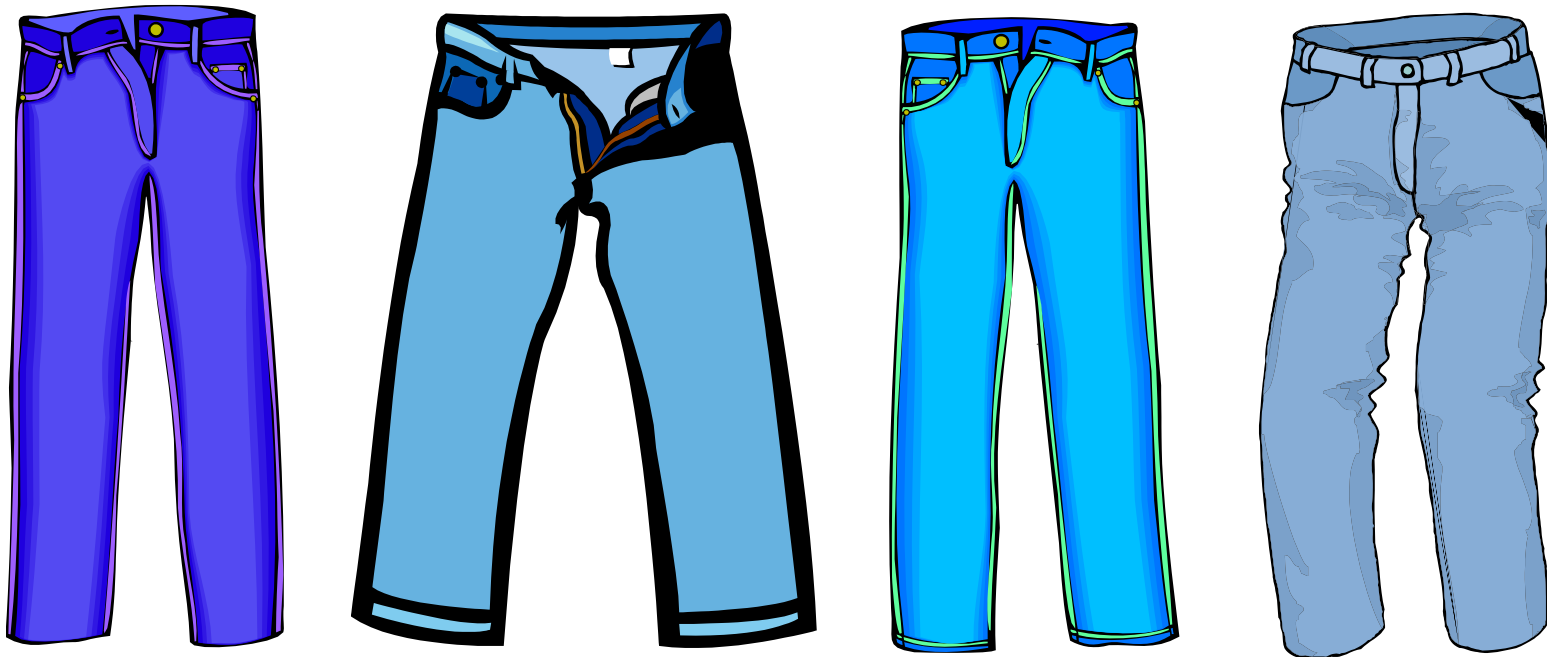
The New Trade Theory

- Explanations for IIT
 - Same good sold across different borders



The New Trade Theory

- Explanations for IIT
 - Differentiated products – the same, but advertised as different (brands of jeans)

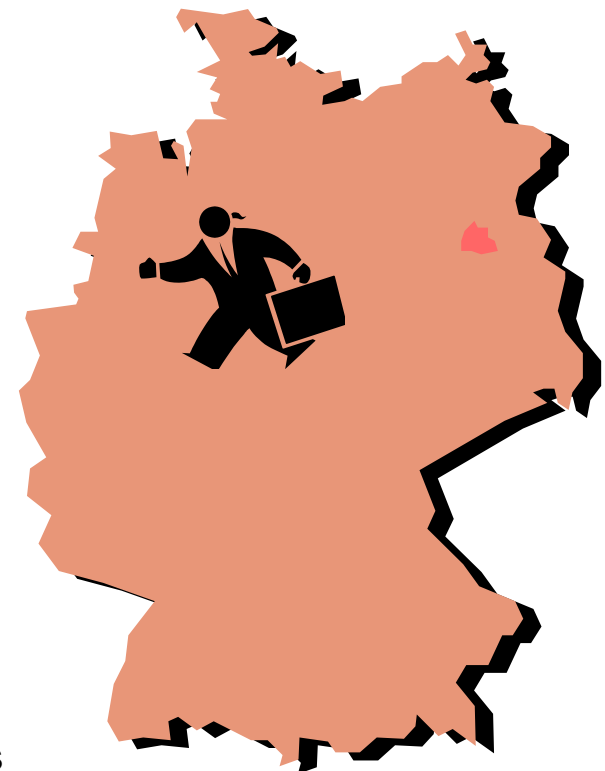


The New Trade Theory

- Explanations for IIT
 - Identical products sold by firms from different countries into each other's markets

The New Trade Theory

- Explanations for IIT
 - Identical products sold by firms from different countries into each other's markets



The New Trade Theory

- 2. Countries as a whole may lose from trade
 - This is not actually likely, but it wasn't even possible in the Ricardian and H-O Models
 - One story: small country may be forced to specialize in an industry with decreasing returns to scale

The New Trade Theory

3. More and broader reasons for countries to gain from trade
 - New gains from each new assumption:
 - Cost reductions due to scale economies
 - Reduced market distortions due to increased competition
 - Consumers benefit from access to more variety
 - Implication: It is possible for all people in a country to gain from trade
 - Contrast to H-O Model and Stolper-Samuelson Theorem, where somebody must lose

The New Trade Theory

4. New rationales for using policy to affect trade

- Called “Strategic Trade Policy” – See Krugman article
- How?
 - If some industries are better to have than others (due perhaps to scale economies), “industrial policy” may promote these industries
 - If imperfectly competitive firms earn profits, trade policy may be used to get more profit for a country’s own firms

The New Trade Theory

- Strategic Trade Policy: Boeing-Airbus Game

P=produce, N=not produce

No subsidy,

Boeing choice: depends on Airbus

Payoff Matrix

Airbus

Equil. If Boeing moves first,
since now Airbus will not
enter

Boeing choice depends on Airbus choice.

	P	N
P	-5, -5	100, 0
N	0, 100	0, 0

The diagram illustrates a game tree for the Boeing-Airbus game. The root node is a circle labeled "Boeing". From this node, two branches emerge: one labeled "P" leading to a square node labeled "Airbus", and another labeled "N" leading to a square node labeled "Boeing". The "Airbus" node has two branches: "P" leading to a circle node with payoffs (-5, -5), and "N" leading to a circle node with payoffs (100, 0). The "Boeing" node has two branches: "P" leading to a circle node with payoffs (0, 100), and "N" leading to a circle node with payoffs (0, 0). The payoffs are listed as (Boeing, Airbus).

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The New Trade Theory

- Strategic Trade Policy: Boeing-Airbus Game

P=produce, N=not produce

No subsidy

Now Airbus
choice does
not depend on
Boeing
Boeing

		Airbus	
		P	N
Boeing	P	-5, -5	0, 100
	N	100, 0	0, 0

The New Trade Theory

- Strategic Trade Policy: Boeing-Airbus Game

P=produce, N=not produce

No subsidy, Airbus Subsidy = +10

Airbus

		Airbus	
		P	N
Boeing	P	-5 -5 (+5)	100 0
	N	100 0	(110) 0

Equil. with
subsidy and
exit

Equil. With no
subsidy if Boeing
moves first

The New Trade Theory

- Boeing-Airbus Game results
 - If Boeing moves first, without subsidy Airbus will not enter
 - Boeing and US gain +100
 - Airbus and EU+A (EU including Airbus) gain 0
 - If EU pays subsidy, Airbus will enter and Boeing will exit
 - Airbus gains 110, EU+A gains 100 (=110-10)
 - Boeing and US gain 0
 - Thus EU gains and US loses from EU subsidy

The New Trade Theory

- 4. New rationales for using policy to restrict trade
 - But note Krugman's conclusion: These arguments are not likely to be usable:
 - Empirical difficulties: Hard to know where to intervene
 - Entry: Benefits will be dissipated by new firms
 - General equilibrium: Help in some sectors hurts others
 - Retaliation: Other countries may react
 - Political economy: Industries lobby for help

Clicker Question

Which of the following is not an assumption used in the New Trade Theory?

- ✓ a) Markets are perfectly competitive
- b) There are increasing returns to scale
- c) Products are differentiated

Clicker Question

Which of the following is an explanation of intra-industry trade?

- a) Products are homogeneous
- b) Countries lack comparative advantage
- c) Countries must export in order to pay for imports
- ✓ d) Competitors from different countries compete by selling into each other's market
- e) Smuggling

Clicker Question

In the Boeing-Airbus game that we looked at, how do we know that the EU (including Airbus) benefits from providing the subsidy?

- a) Because Boeing loses profit
- b) Because Airbus gains profit
- c) Because the US ceases to produce planes
- ✓ d) Because Airbus gains more profit than the EU government pays it

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The New New Trade Theory

- Heterogeneous Firms
 - Due to Marc Melitz (UM Phd 2000)
 - Assumes that firms within an industry differ in productivity (+ other assumptions of New Trade Theory)

The New New Trade Theory

- Heterogeneous Firms (Melitz Model)
 - Implications:
 - More productive firms are larger & earn more profits
 - Opening to freer trade causes
 - Most productive firms to expand and export
 - Least productive firms to shut down
 - Thus average productivity rises
- Yet another new source of gain from trade!
- Also new losers: Those in least productive firms in all tradable industries (inc. exports)

Clicker Question

If a country's comparative advantage is based on a technology that other countries lack, why might it lose that comparative advantage over time?

- a) Technology transfer to other countries
- b) Multinational companies that use technology abroad
- c) Technical progress that makes earlier innovations obsolete
- ✓ d) All of the above

Clicker Question

If a country's comparative advantage is based on relative abundance of capital, why might it lose that comparative advantage over time?

- ✓ a) Other countries accumulate even more capital
- b) The Heckscher-Ohlin theory ceases to be valid beyond the short run
- c) The good that it exports becomes obsolete
- d) All of the above

Next Time

- Tariffs

(Visiting lecturer, Dominick Bartelme)

- What are they and how are they used?
- What effects do they have?
 - Theory: Supply and Demand
 - Data