Assumption 1

- Each firm produces a good that is similar to but differentiated from the goods that other firms produce.
- i.e. differentiated goods

Assumption 2 and 3

- Assumption 2: There are many firms.
- Assumption 3: Increasing returns to scale
- Increasing returns to scale allows AC to decrease. In other words, average cost is decreases. It will decrease as long as AC>MC.

Assumption 4

- In the long run, profit is equal to zero ($\pi = 0$).
- This is referred to as the free entry and exit condition.
- In the short run, firms are allowed to have positive profit.

Adjustment costs from trade

- There are only adjustment costs in the short run. In the long run, trade adjustment costs do not exist.
- Some firms close down and those workers search for new jobs.
- In the long run, these workers get jobs with other firms or in other industries.
- We normally don't care about the short run in trade and therefore we do not care about adjustment costs in the short run, but we want to be sure the costs in the short run are outweighed by the gains of trade. Usually, this is the case.

North American Free trade Agreement

- Also known as NAFTA.
- 1984, combines Canada, US, and Mexico (who joined in 1994) into a trade area.
- The movement for free trade greatly reduced tariffs between these countries.
- This provided a natural experiment for economists to study.

Canada

- Canada joined NAFTA to gain a larger market to sell to.
- Short adjustment costs: 100,000 lost jobs or 5% manufacturing employment loss.
- Big job loss, but new firms in other sector absorbed the workers.
- So, in the long run, there was no big change in terms of employment.
- Gains in the long run: productivity rose as much as 18%.
- Which industries should see the most gains in productivity??

Mexico

- American tariffs on Mexican goods were often high.
- Tariffs declined greatly: 14% to 1%
- Productivity increased more in plants that specifically saw trade with America.
- Between 1994 and 1997, wages in Mexico fell.
- Does this make sense?
- Explained by finical crisis in Mexico at the time.

Mexico

- After 1998, wages in all sectors rose, so workers did not receive benefits from trade.
- We should have seen a short run increase in the wages of sectors who directly benefited from the opening of tariffs. All wages going up at once pointed more to the growth of the economy at the time.
- Capital owners absorbed all of it.
- High-skilled also gained

America

- We look more at expansion of variety since US exports to many other countries.
- NAFTA didn't affect exports that much in US.
- Products imported from Mexico grew in all sectors.
- Gains=more varieties

America: Adjustment Costs

- 1994-2002: 525,000 workers lost their jobs.
- About 13% of all unemployment at the time was due to NAFTA.

Intra Industry Trade Index

- Index=$\frac{\text{min of imports and exports}}{\frac{1}{2}(\text{IM}+\text{EX})}$
- A high index number: equal amount is imported and exported.
- A low index number: Good is either heavily imported or heavily exported.
- Ex: Vaccines: Exports=$2,514 million, Imports=$1,731 million
- min. of imports and exports is $1,731 million.
- Index=$\frac{1{,}731}{\frac{1}{2}(1731+2514)} = \frac{1{,}731}{2{,}123} = .82$

Intra Industry Trade Index

- So, 82 percent of US trade in the vaccines is intra-industry. US is neither a large exporter or importer.
- Index for whiskey: 82 percent.
- Index for Apples: 34 percent.
- Index for Men's shorts: 2 percent.

Gravity Equation

- Newtons: $F_g = G\frac{M_1 * M_2}{d^2}$. G is a constant, d is distance, and M_i is the mass of object i
- Trade: $Trade = \beta\frac{GDP_1 * GDP_2}{d^n}$. β is a constant, d is distance, n is a parameter, and GDP_i is the GDP of country i
- So, trade goes up if both countries have large GDP and/or a small distance between them.

Border Effects

- Factors that make it more difficult or easier to trade goods across border
- Ex: tariffs, quotas, geography, cultural factors, red tape