

Economic Efficiency

Summer 2023
Econ S10-A, Harvard University
Prof. Josh Abel

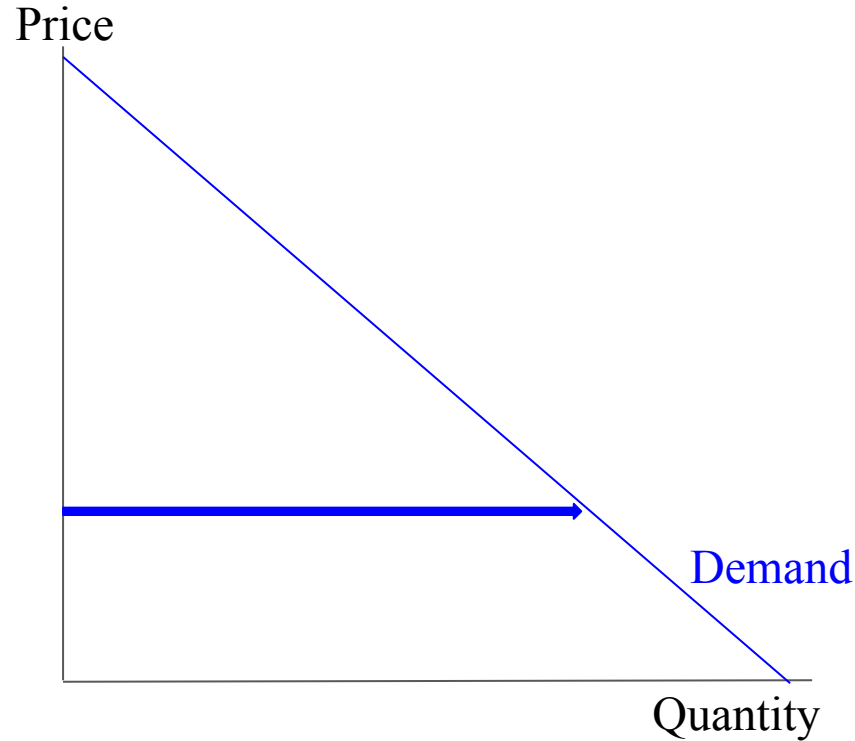
Textbook chapters 7 and 9

Positive vs. Normative Analyses

- Last lecture used Supply and Demand to show how markets:
 - Determine Price and Quantity of a good
 - Allocate the production and consumption of the good
 - And how all of this responds to changes in market conditions
- That was Positive Analysis
 - How the world works
 - E.g. “A market will produce an equilibrium in which supply equals demand.”
- Today will shift us toward Normative Analysis
 - Pluses and minuses of how the world works; or how the world should work
 - E.g. “Market equilibria are efficient.”
 - E.g. “Market equilibria are unfair.”

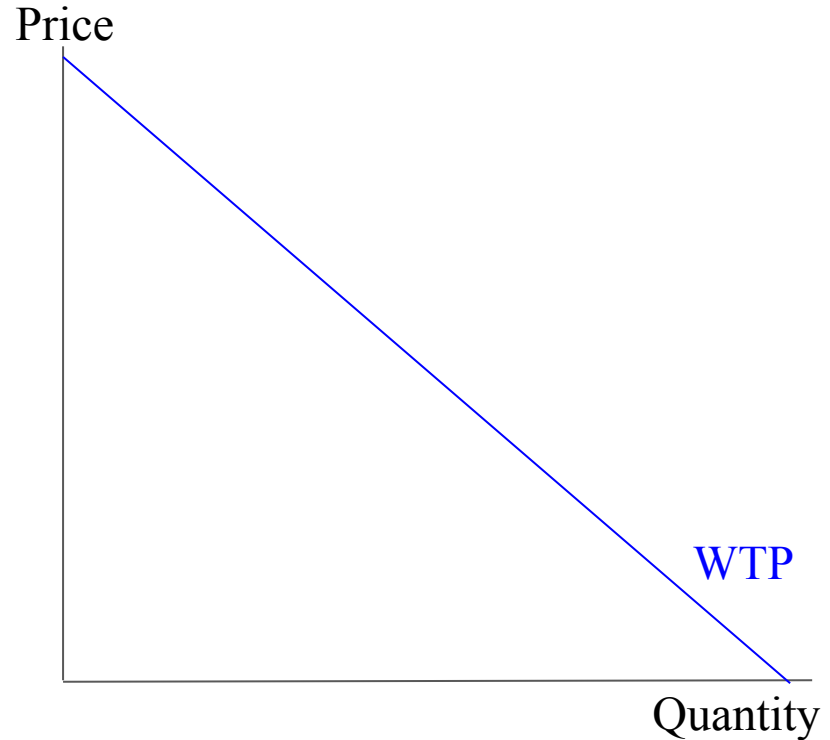
Willingness-to-Pay

- Demand Curve shows Q^D for any given P
 - (Horizontal)



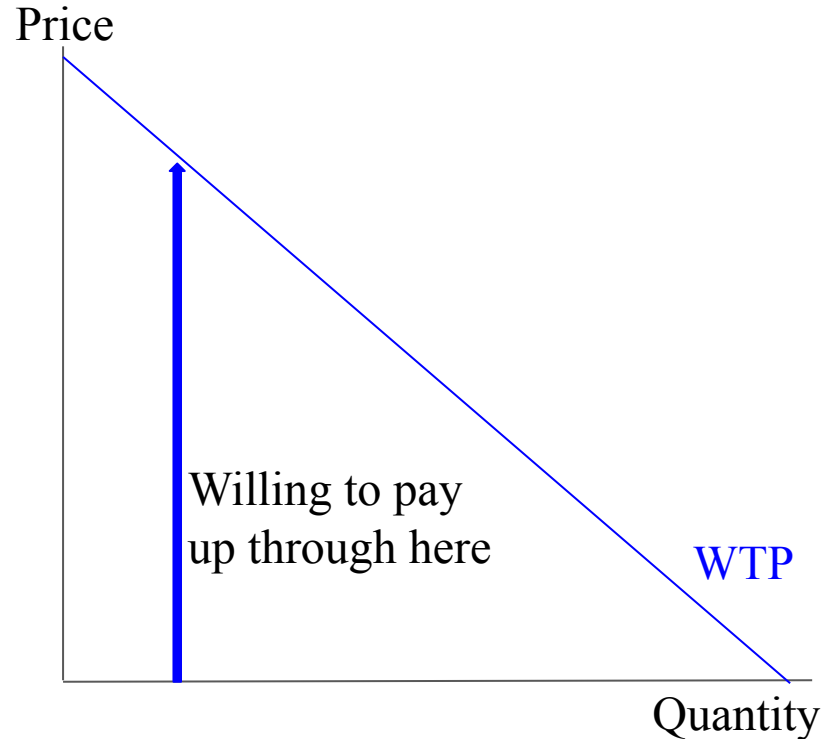
Willingness-to-Pay

- Demand Curve shows Q^D for any given P
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- Suppose consumers are Rational
 - They spend money as wisely as they can
- Demand Curve shows Willingness-to-Pay
 - Maximum they would spend for the good
 - Shows how the good is *valued*
 - (Vertical)



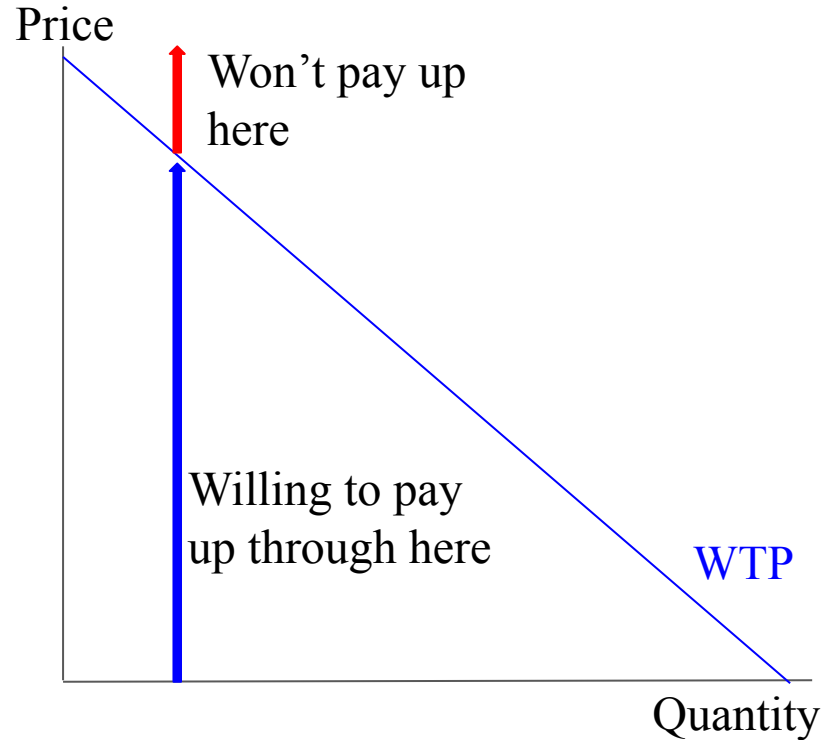
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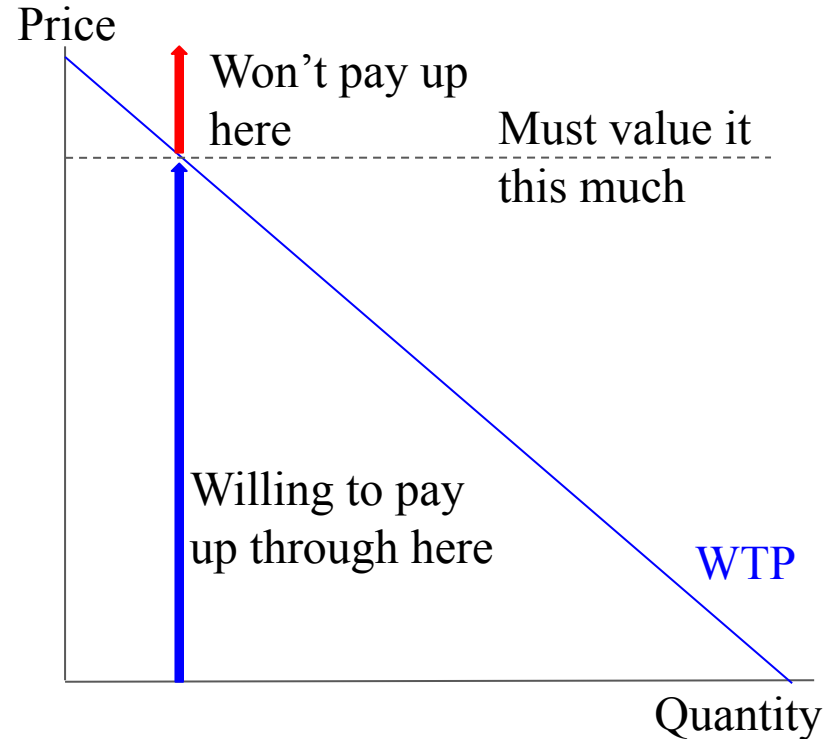
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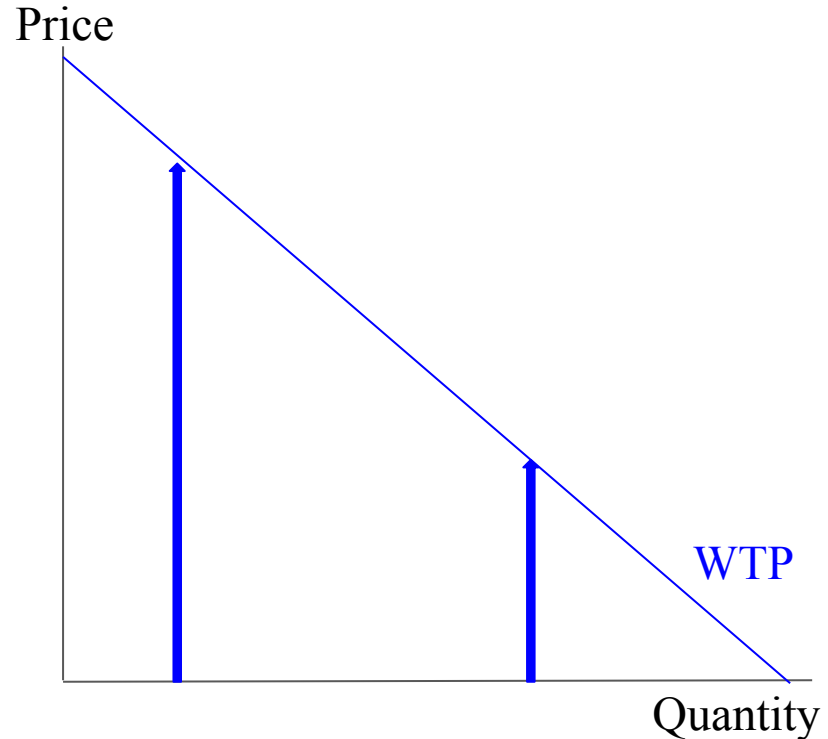
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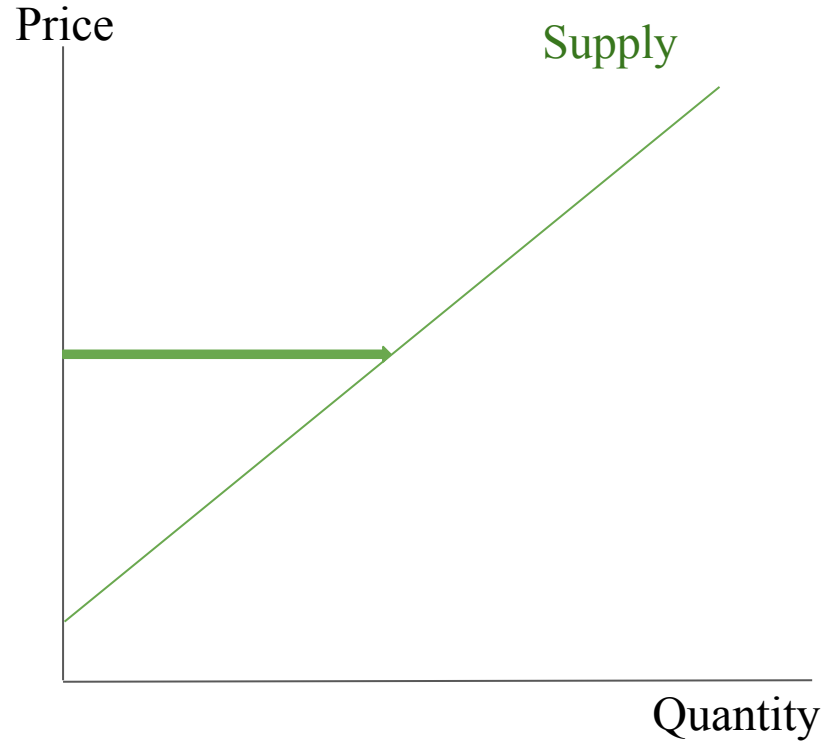
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 - (Vertical)
- Downward-sloping Demand:
 - First units consumed are more valuable
 - Diminishing Marginal Value
 - Value of each unit is less than the one before



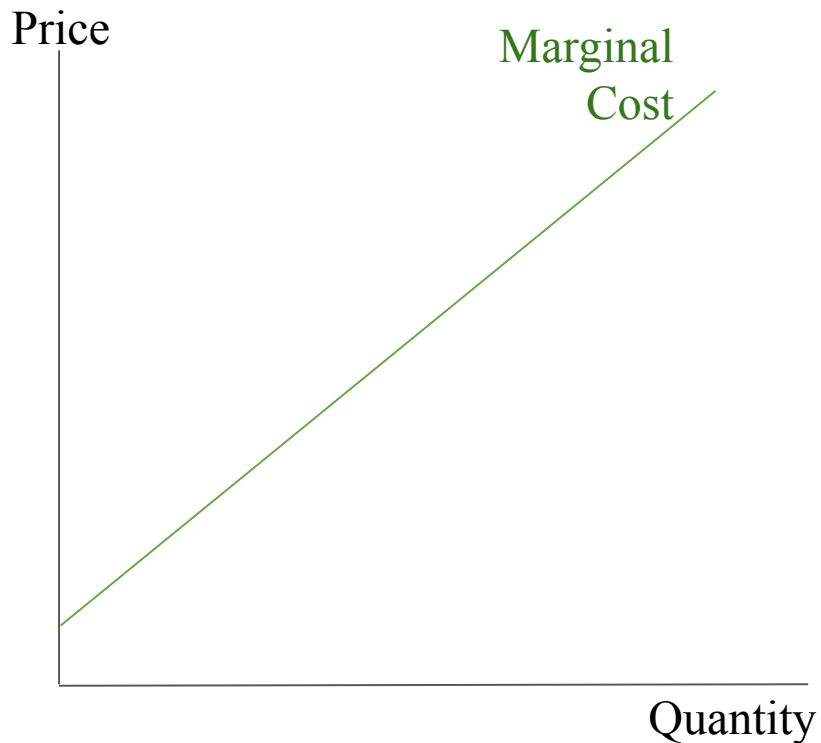
Marginal Cost

- Supply Curve shows Q^S for any given P
 - (Horizontal)



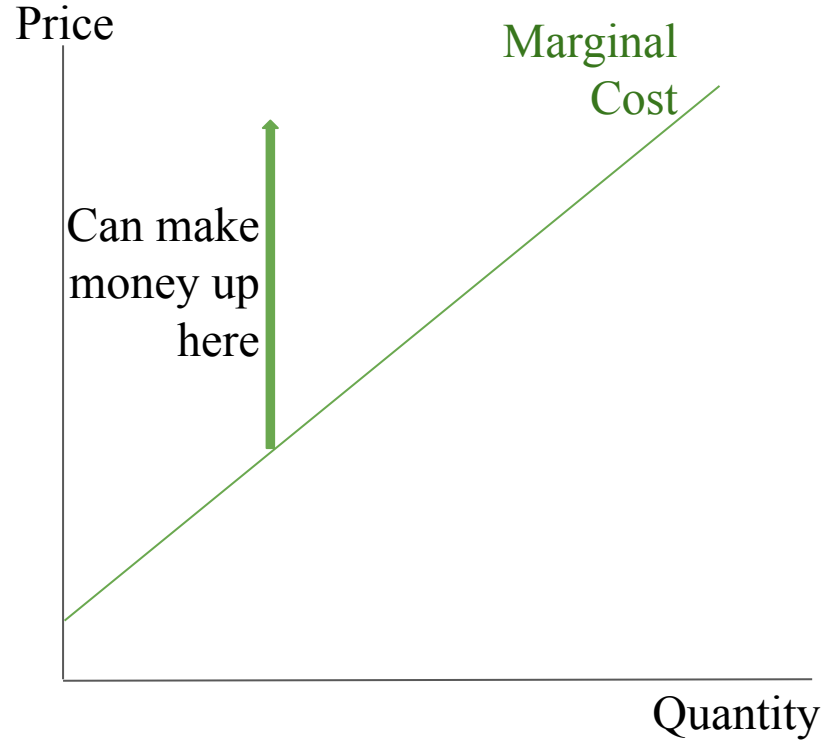
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- Supply Curve shows Q^S for any given P
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 - Cost of producing each unit
 - (Vertical)



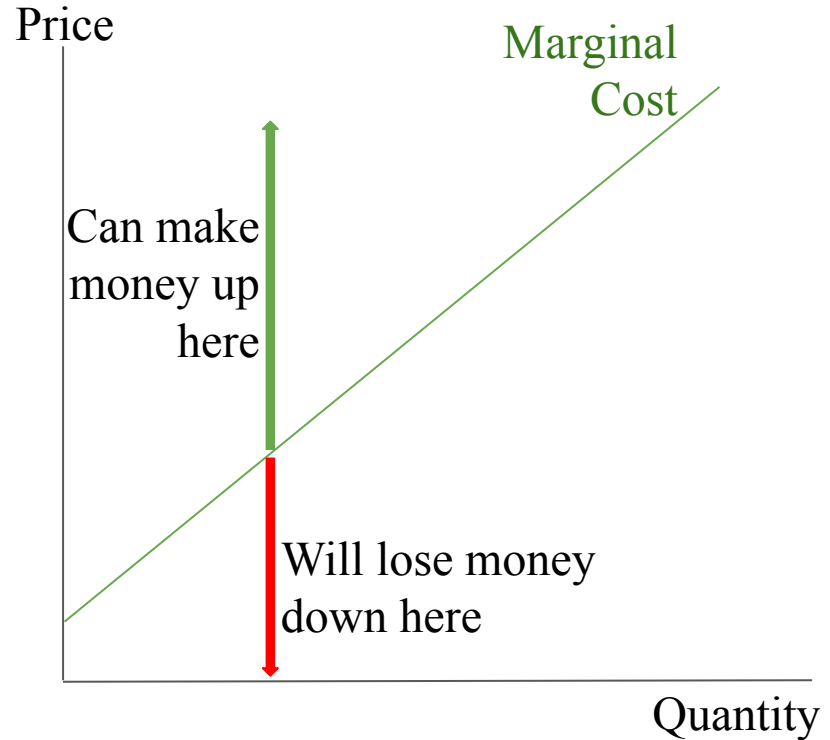
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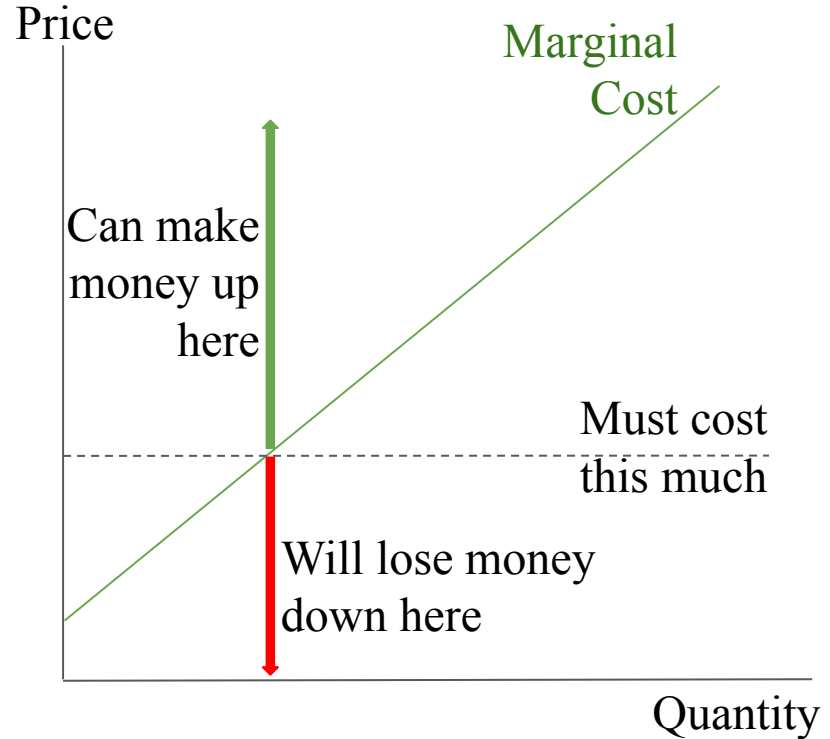
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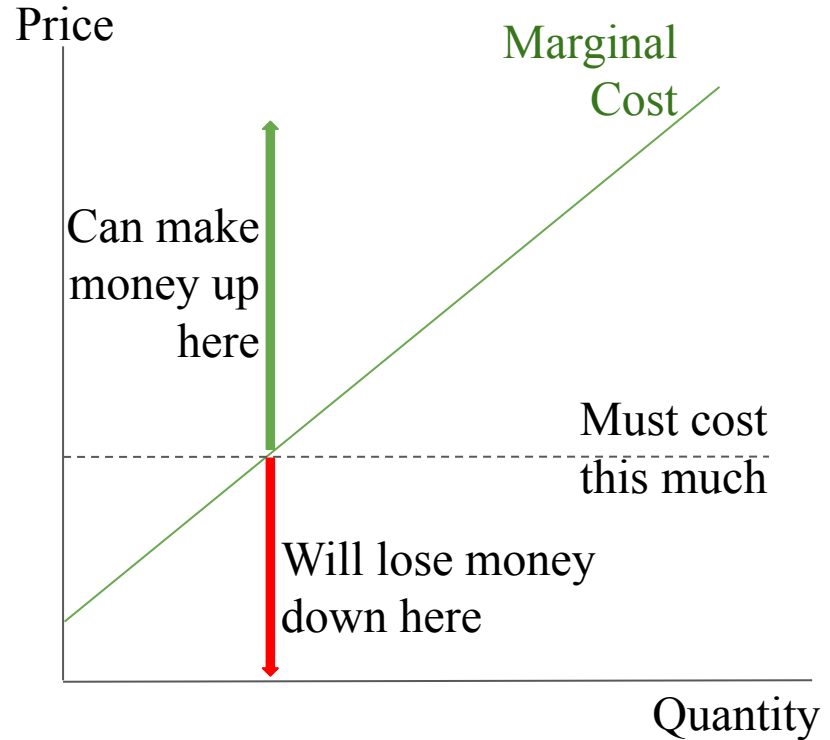
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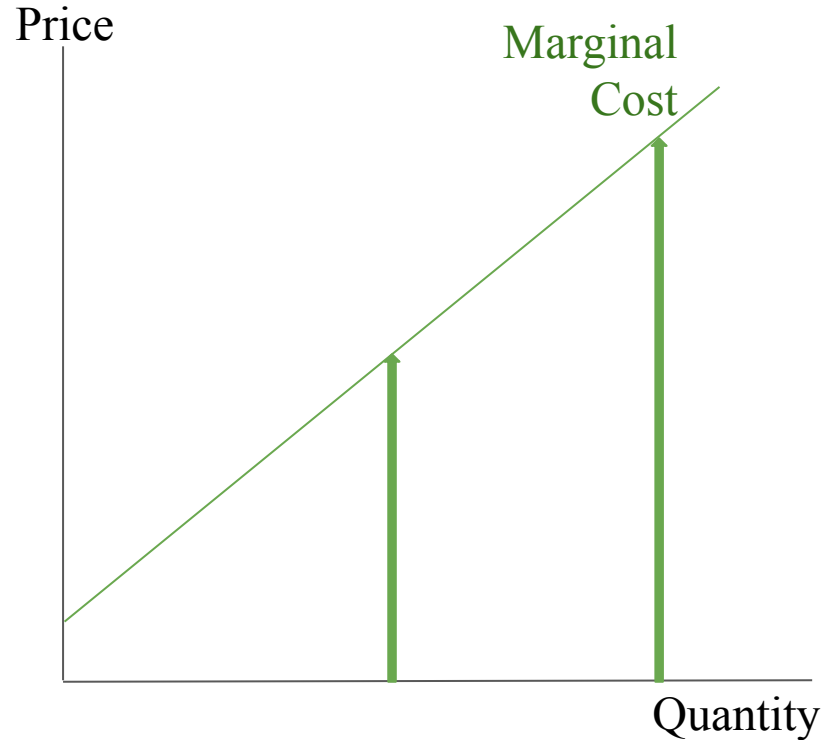
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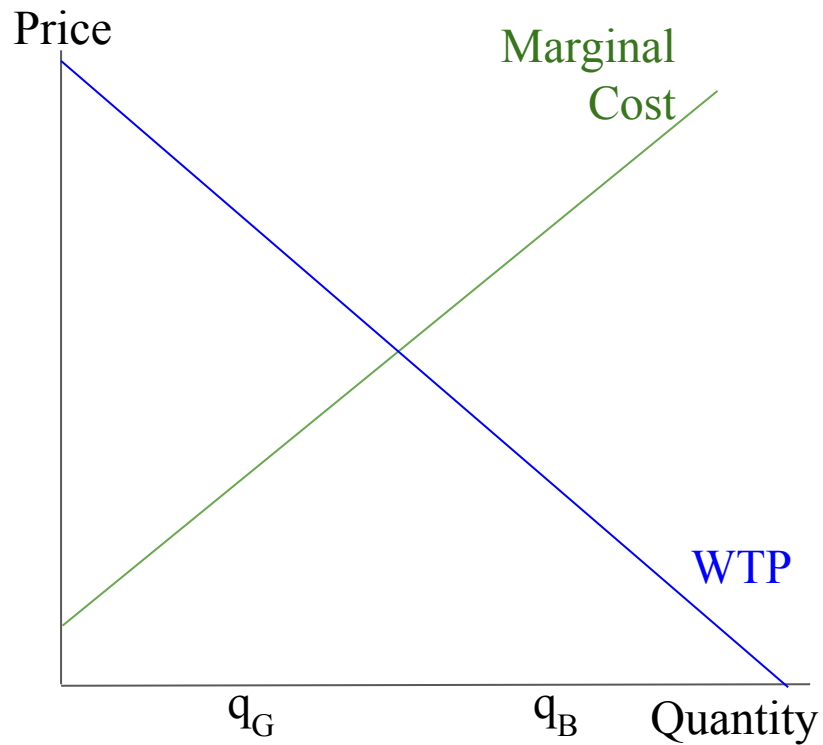


Marginal Cost

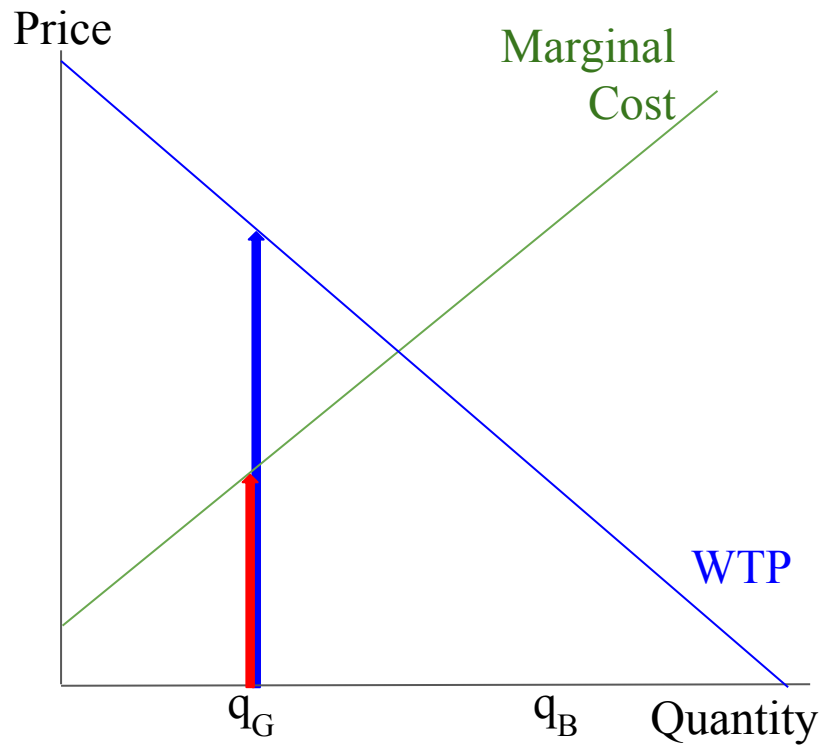
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 - (Horizontal)
- Supply Curve shows Marginal Cost
 - Cost of producing each unit
 - (Vertical)
 - In a few weeks, we'll show that this is not always the case...
- Upward-sloping Supply:
 - First units produced are cheapest
 - Increasing Marginal Cost
 - Most efficient producers enter market first



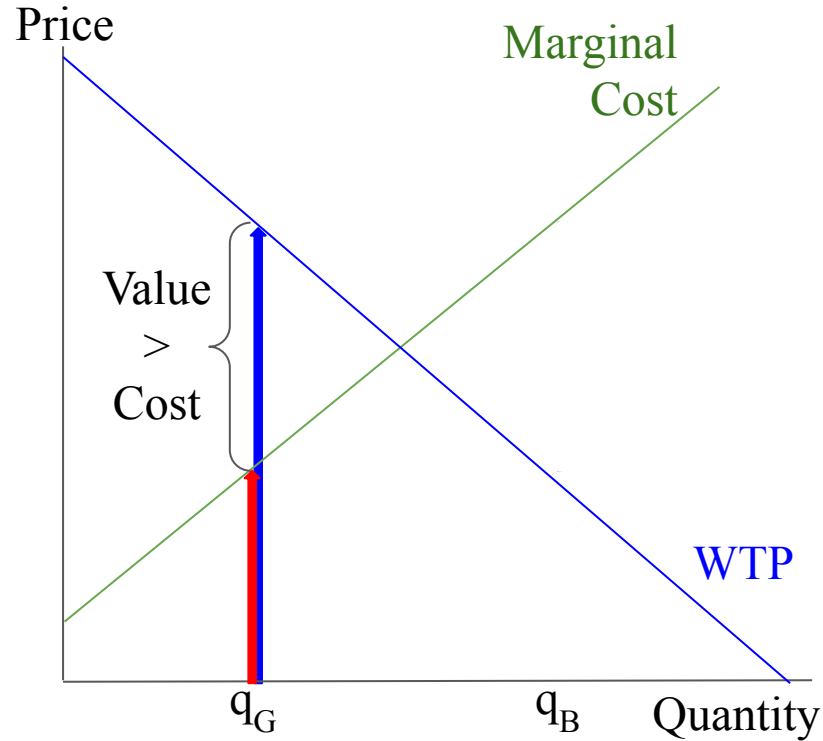
Gains from Trade, Visualized



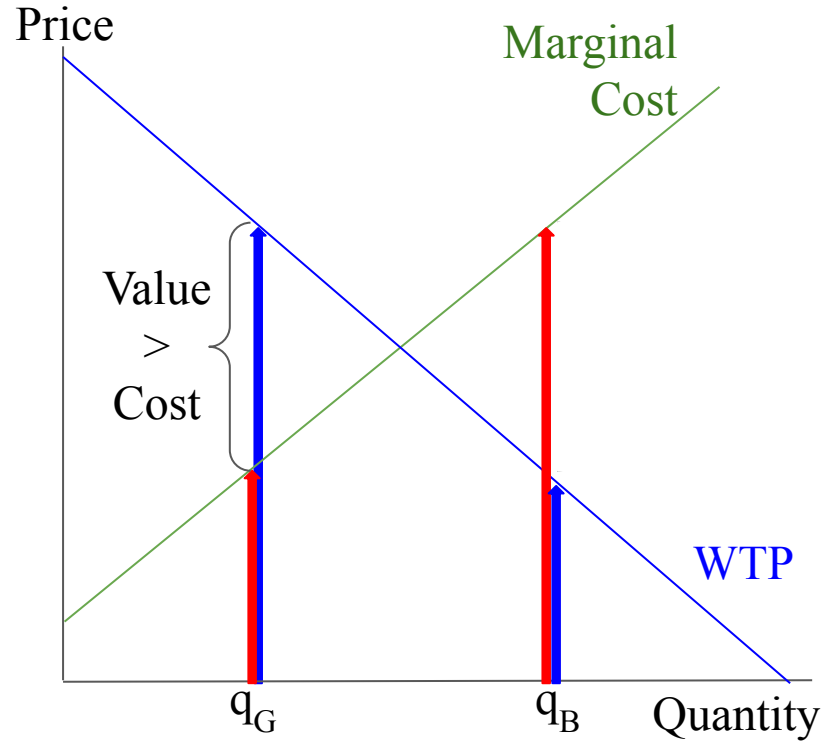
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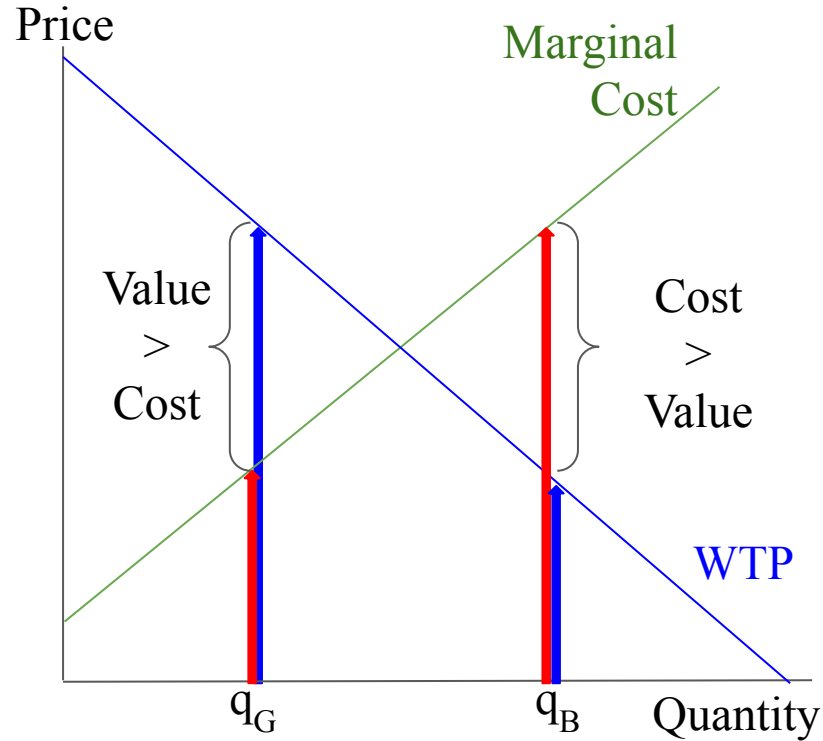
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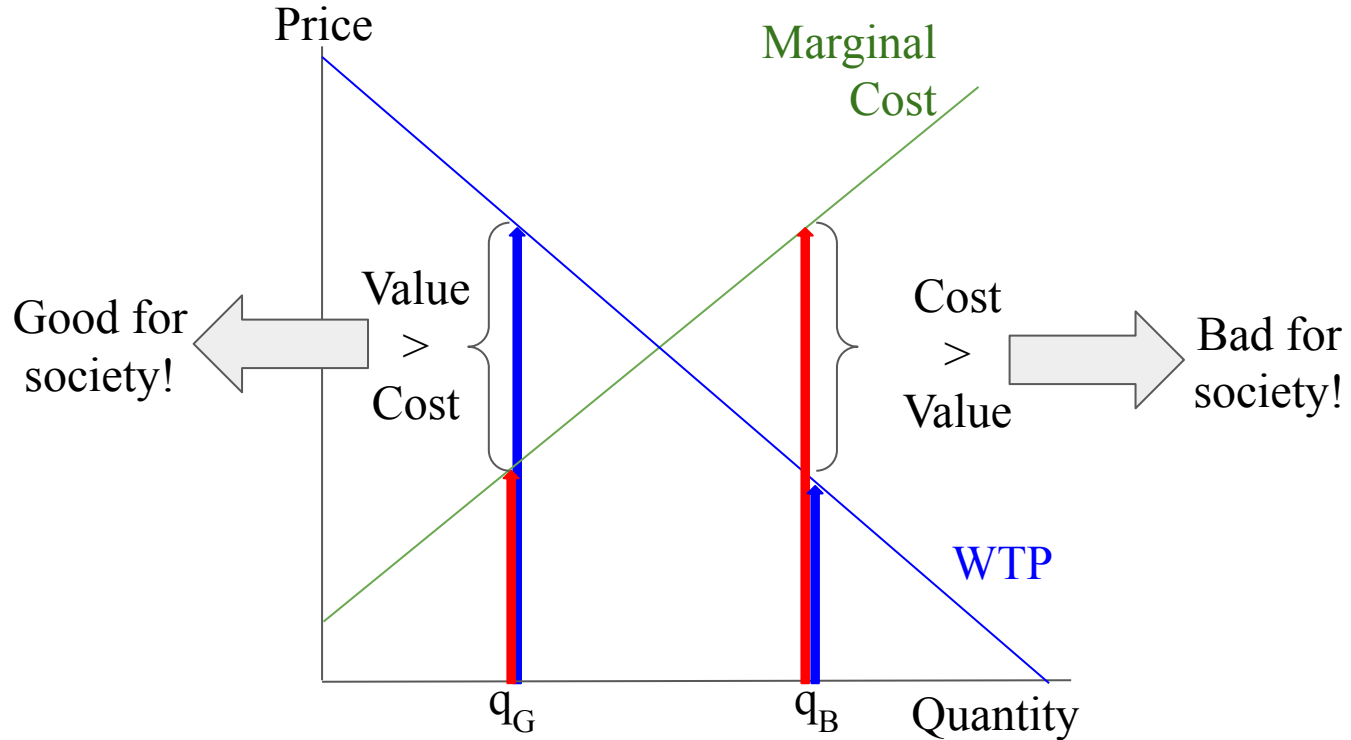
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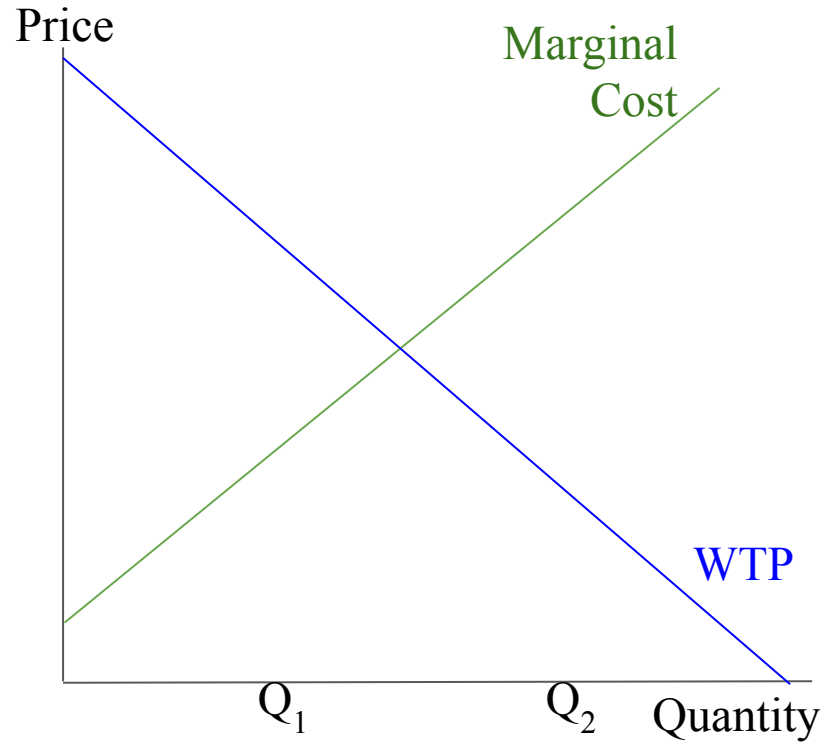
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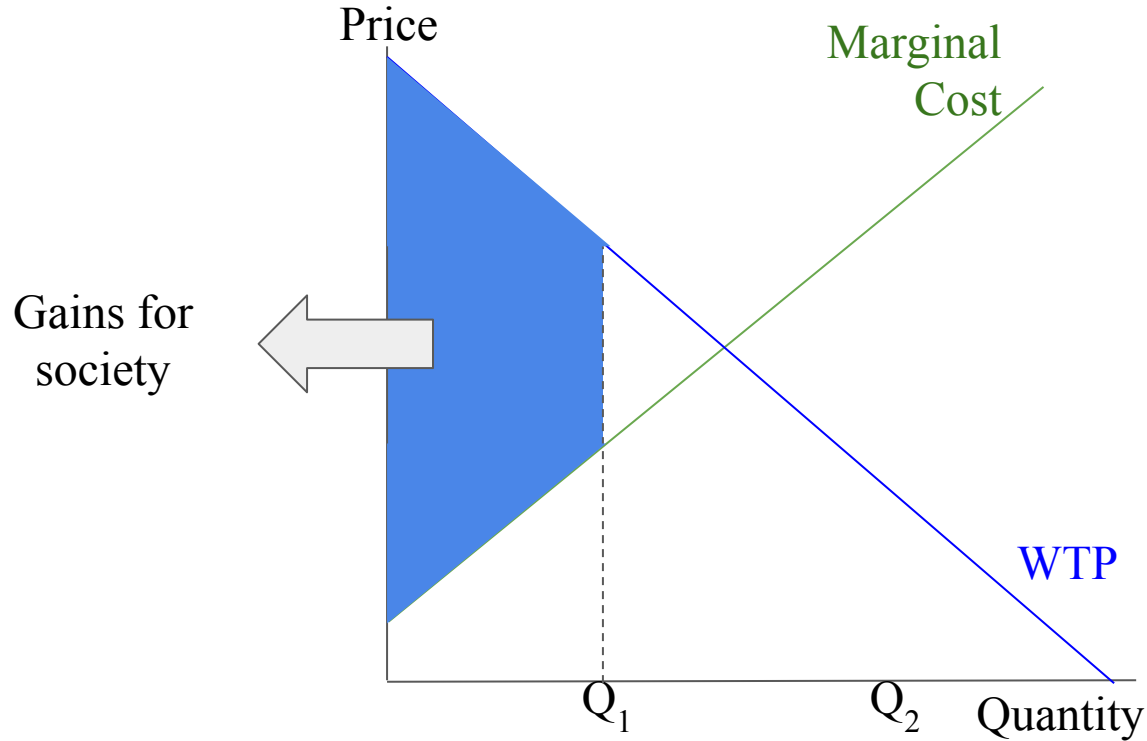
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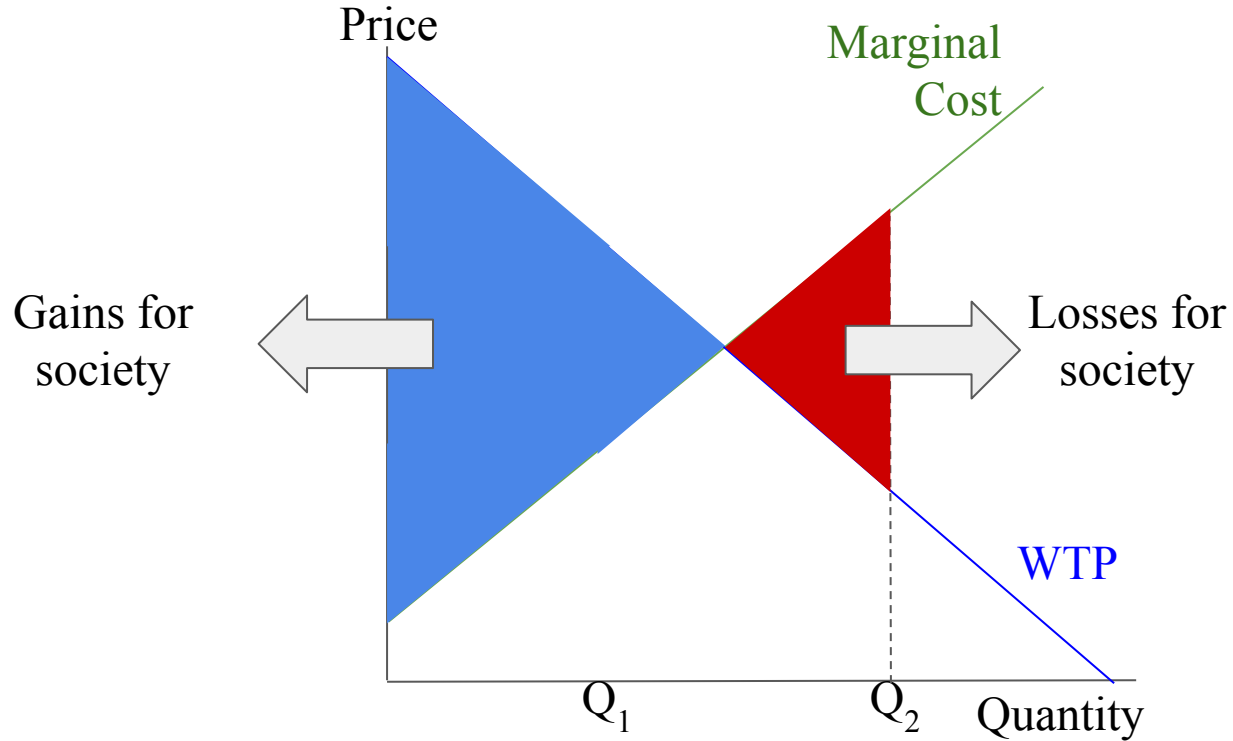
Social Surplus



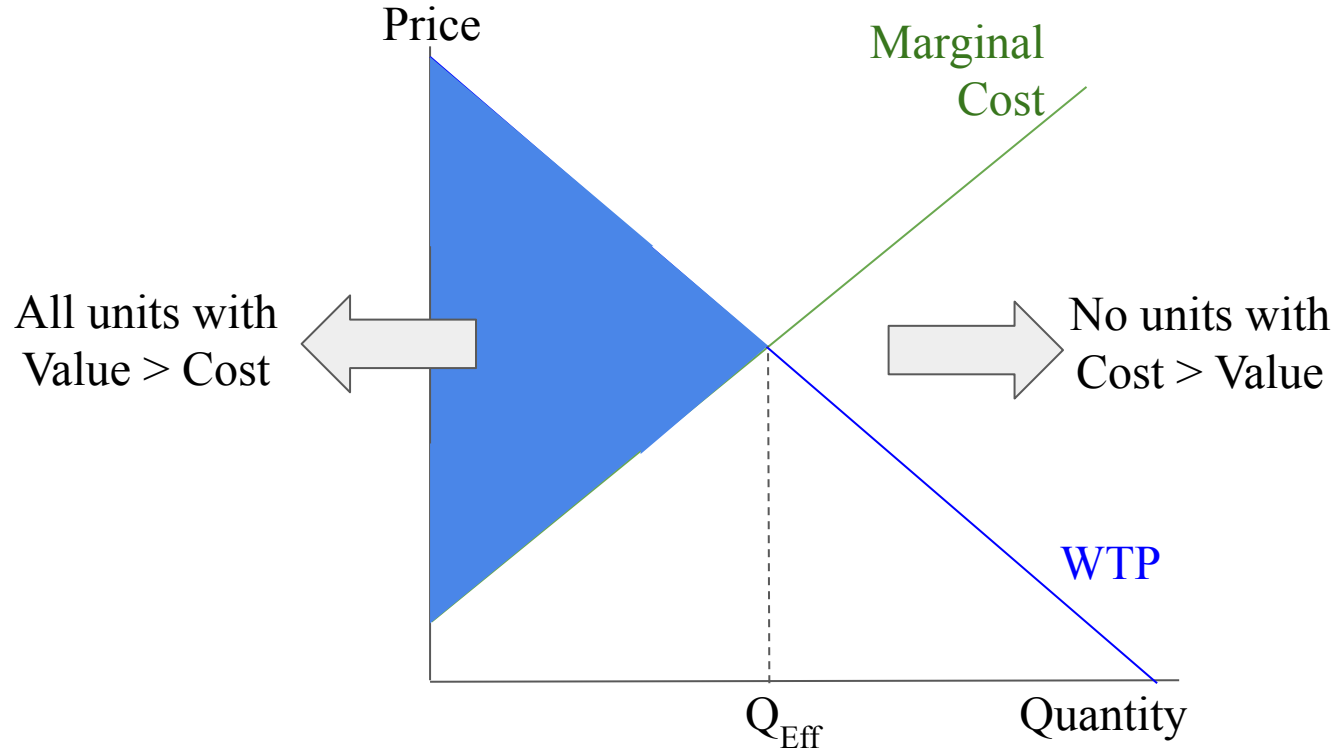
Social Surplus



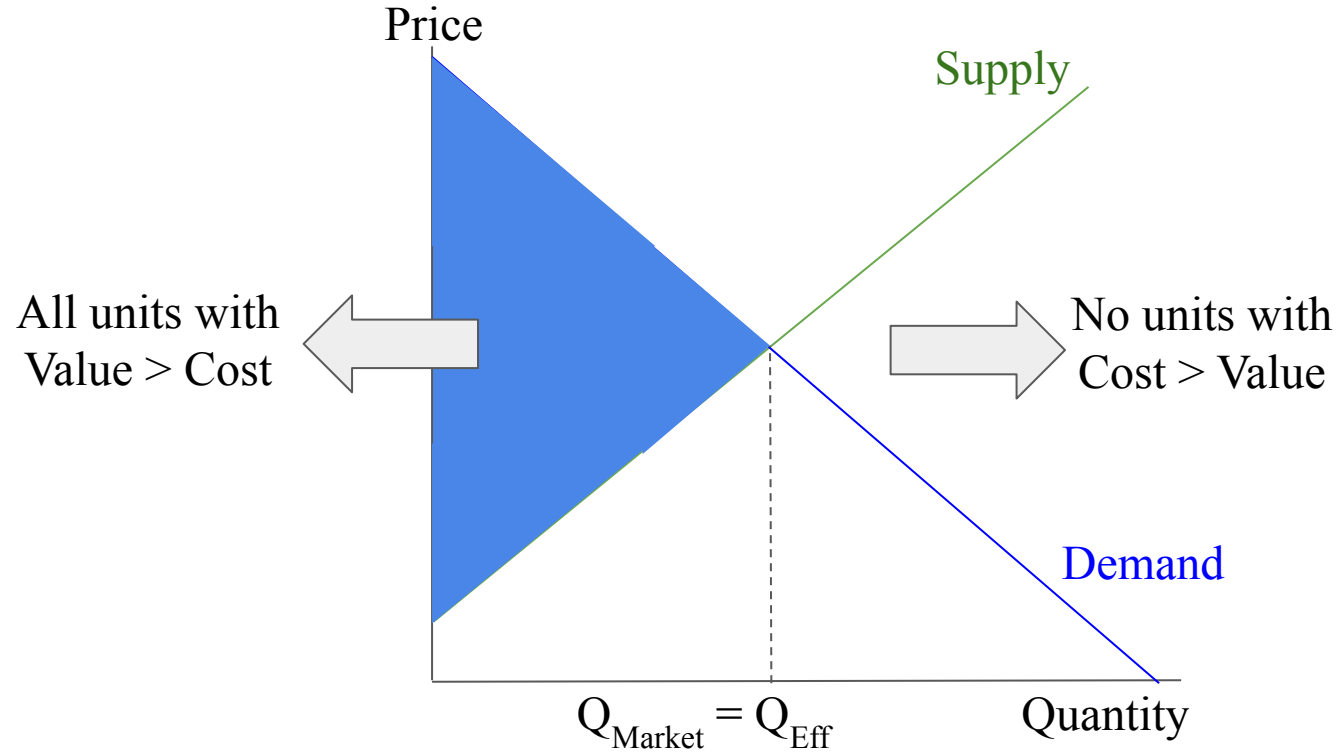
Social Surplus



Efficiency



The Market is Efficient

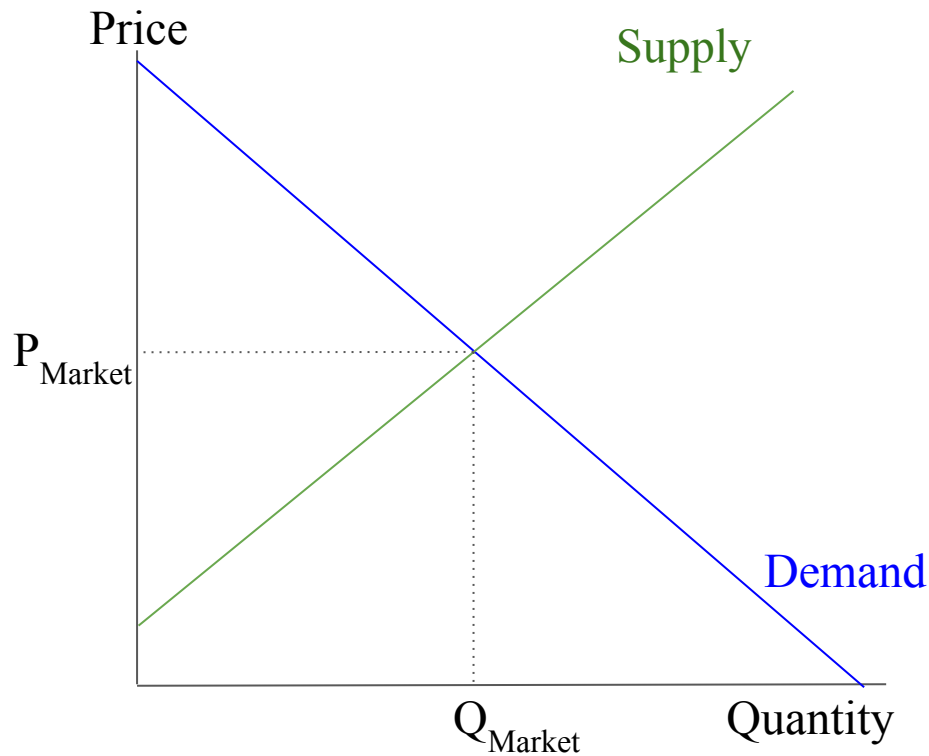


“The Invisible Hand”

- Consumers
 - If your WTP is high, you will be able to find a producers willing to supply you
 - If your WTP is low, you won't
- Producers
 - If your cost is low, you can supply the good at a price that someone is willing to pay
 - If your cost is high, you won't
- On the margin (i.e. for the last unit sold):
 - The consumer's WTP is *just* high enough to justify paying the price
 - The producer's cost is *just* low enough to justify selling at that price
- Therefore, all units sold are valued (WTP) above price and cost (MC) less than the price
 - $\text{Value} > \text{Cost}$
 - Units that aren't sold have $\text{Cost} > \text{Value}$
- The price therefore tells everyone who should participate and who should not!

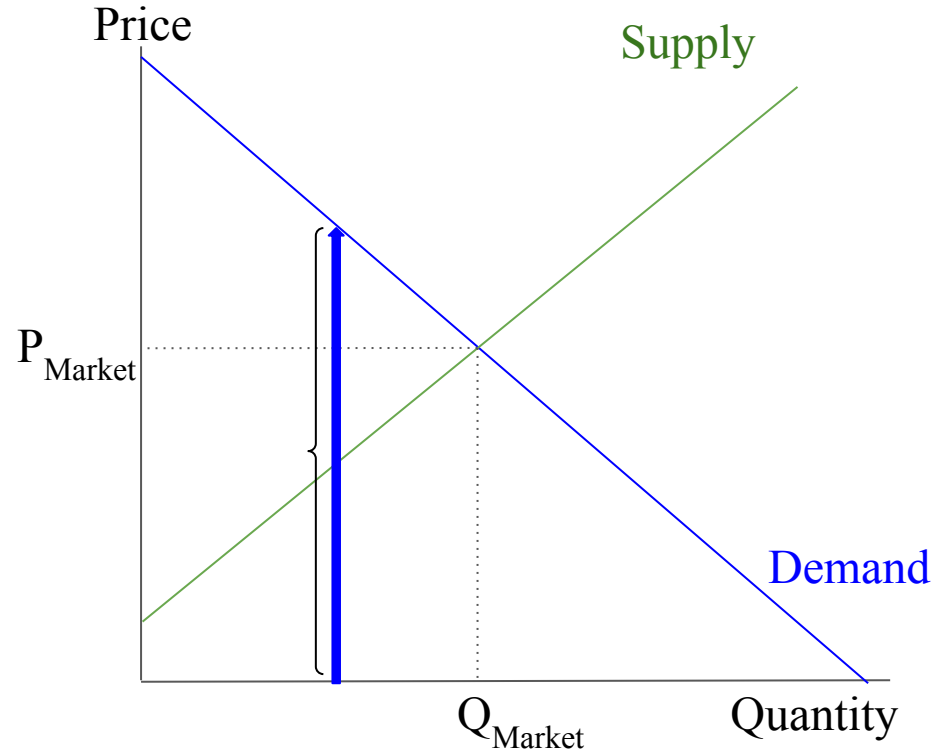
Consumer Surplus

- Some of Social Surplus goes to consumers



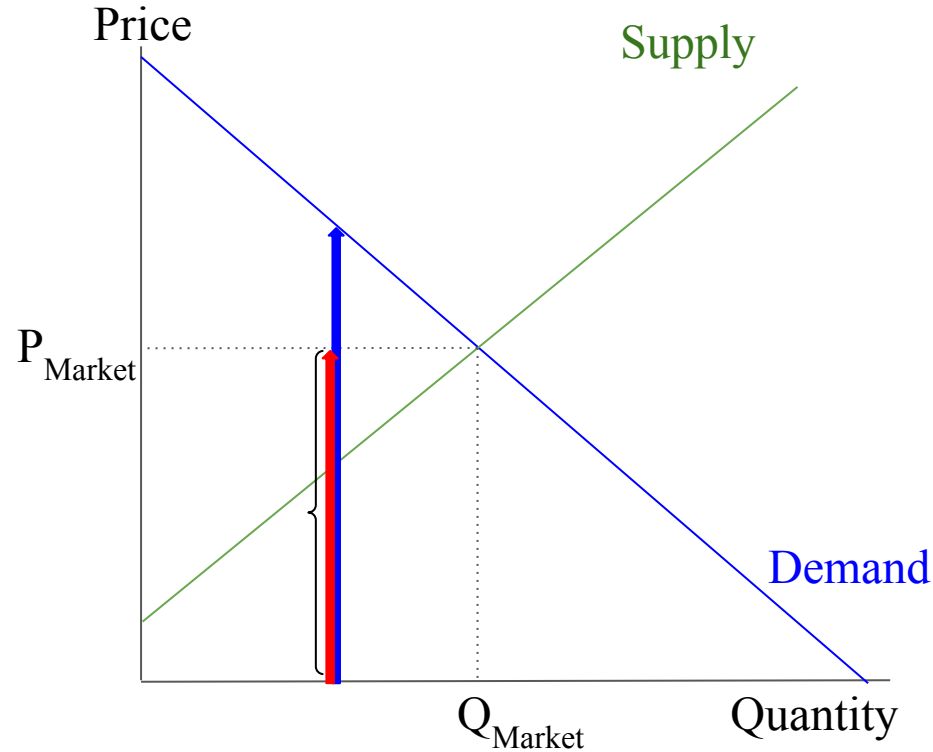
Consumer Surplus

- Some of Social Surplus goes to consumers
- Height of Demand Curve shows WTP...



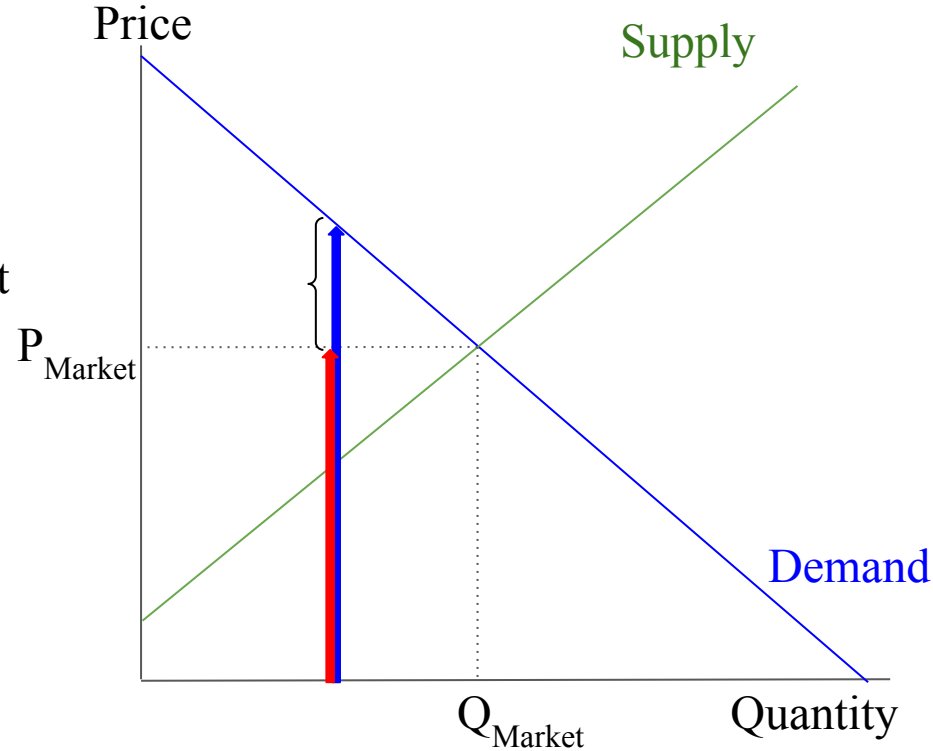
Consumer Surplus

- Some of Social Surplus goes to consumers
- Height of Demand Curve shows WTP...
- Height of price is what they actually pay...



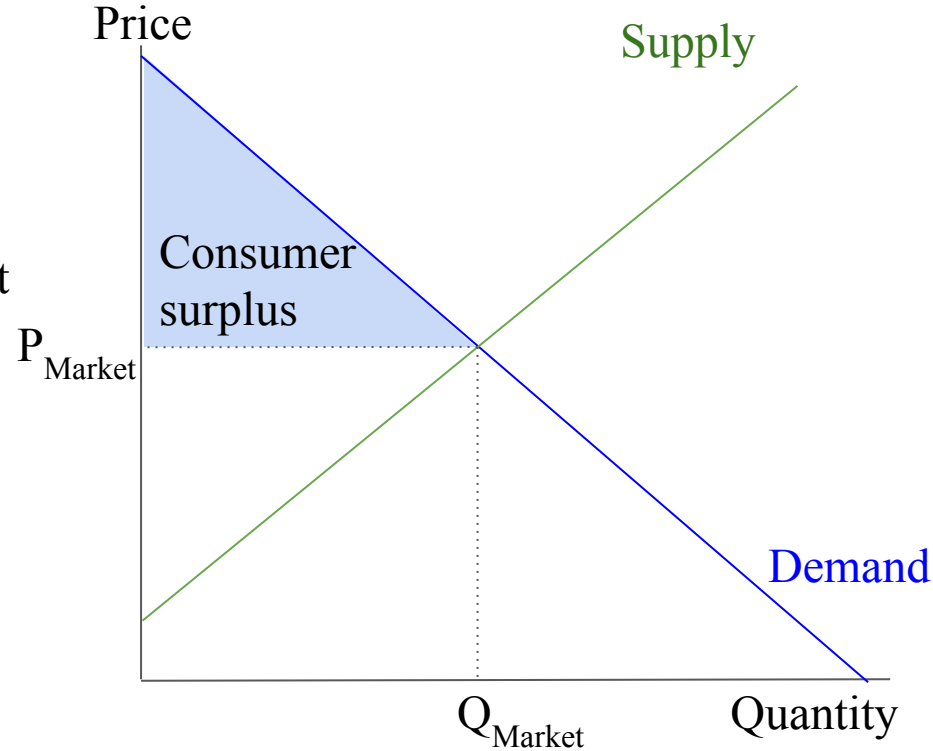
Consumer Surplus

- Some of Social Surplus goes to consumers
- Height of Demand Curve shows WTP...
- Height of price is what they actually pay...
- Difference is their surplus
 - “I would have paid \$10, but I got it for \$8 – that’s \$2 of surplus.”



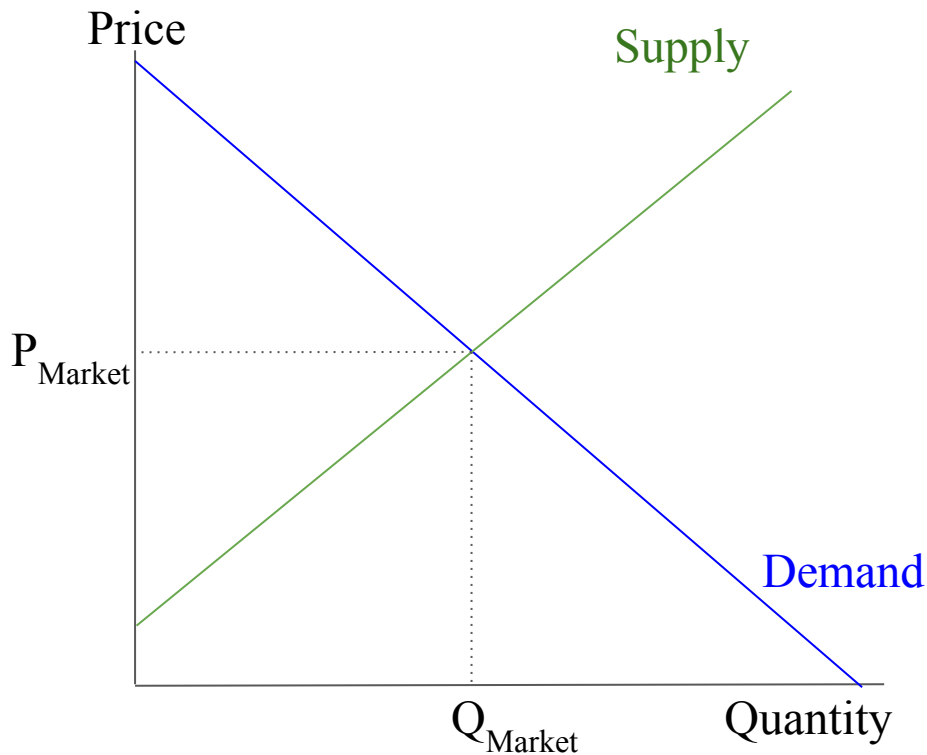
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- Height of Demand Curve shows WTP...
- Height of price is what they actually pay...
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 - “I would have paid \$10, but I got it for \$8 – that’s \$2 of surplus.”
- Consumer Surplus is the WTP in excess of price across all units sold



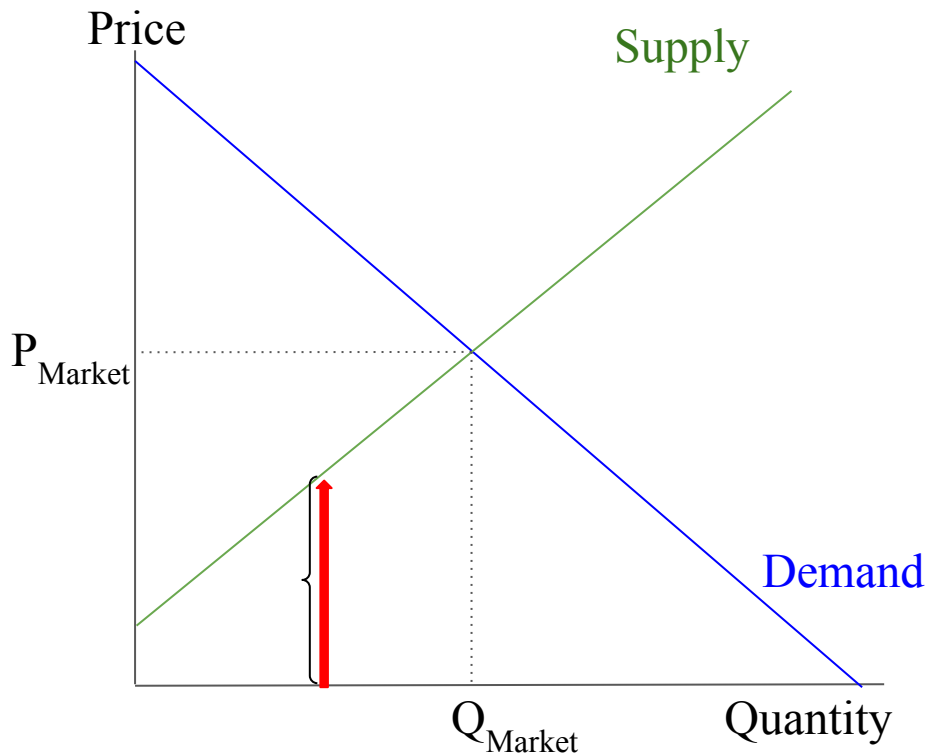
Producer Surplus

- Some of Social Surplus goes to producers



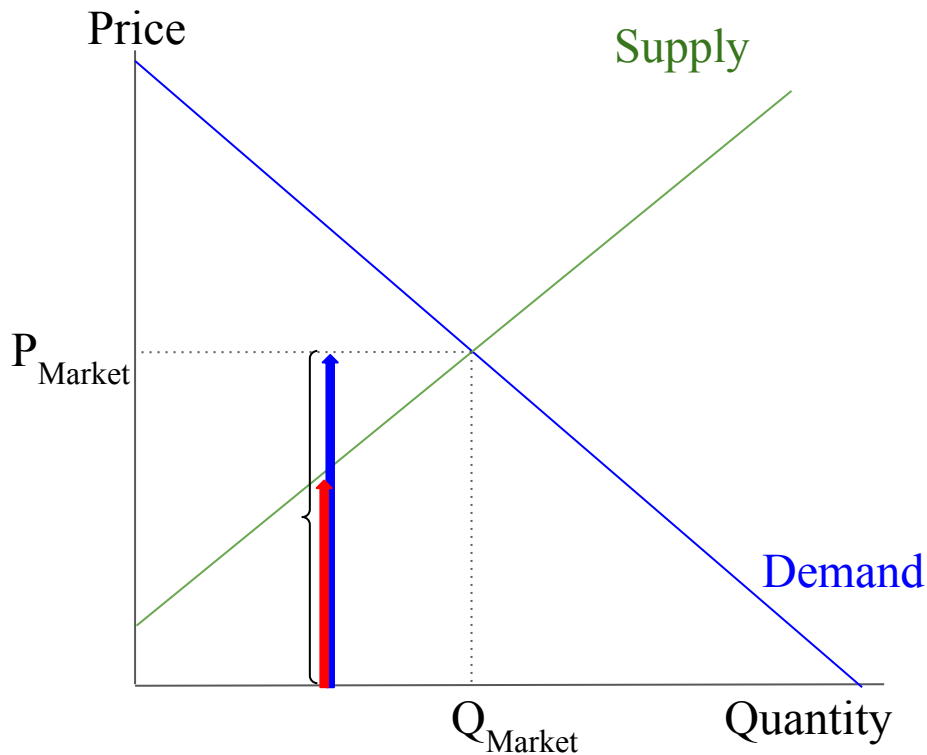
Producer Surplus

- Some of Social Surplus goes to producers
- Height of Supply Curve is cost...



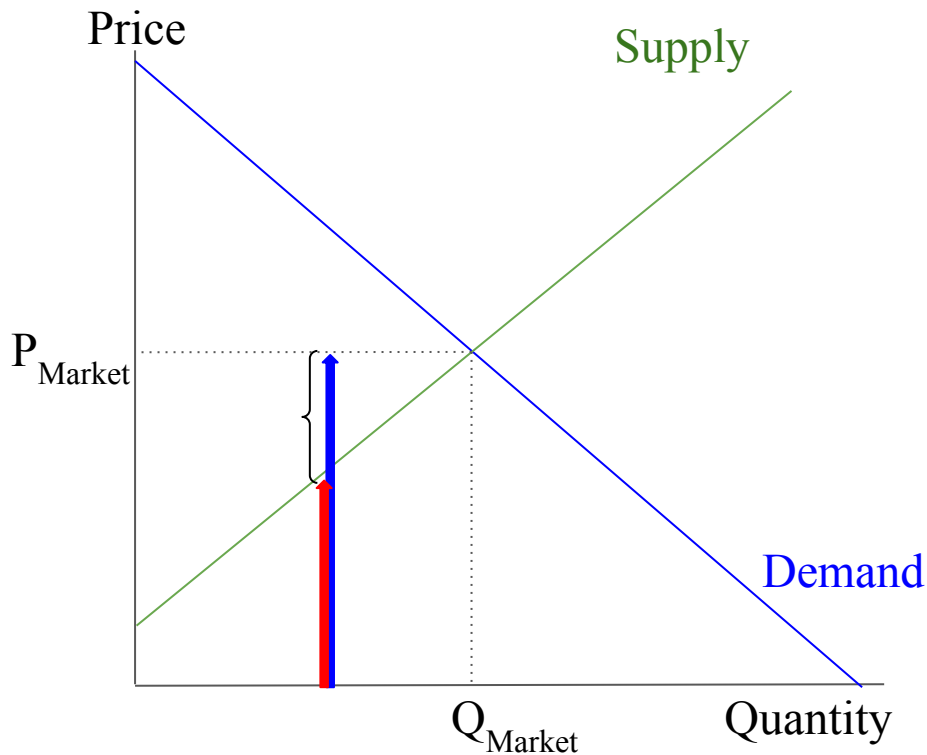
Producer Surplus

- Some of Social Surplus goes to producers
- Height of Supply Curve is cost...
- Height of price is what they actually receive...



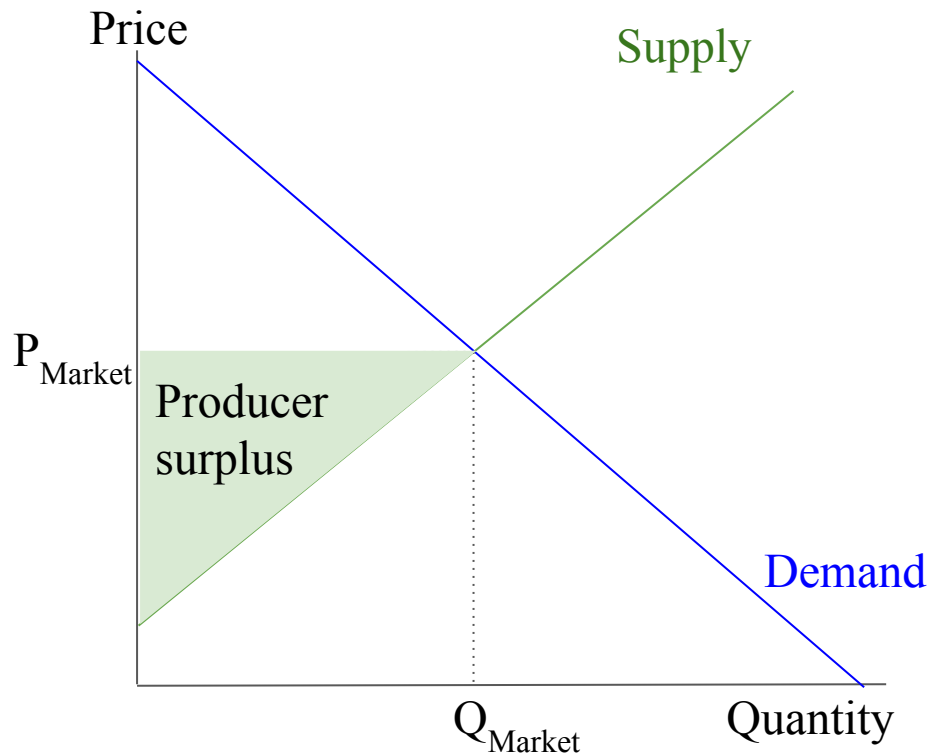
Producer Surplus

- Some of Social Surplus goes to producers
- Height of Supply Curve is cost...
- Height of price is what they actually receive...
- Difference is their surplus
 - “It cost me \$6 to make, but I sold it for \$8 – that’s \$2 of surplus.”



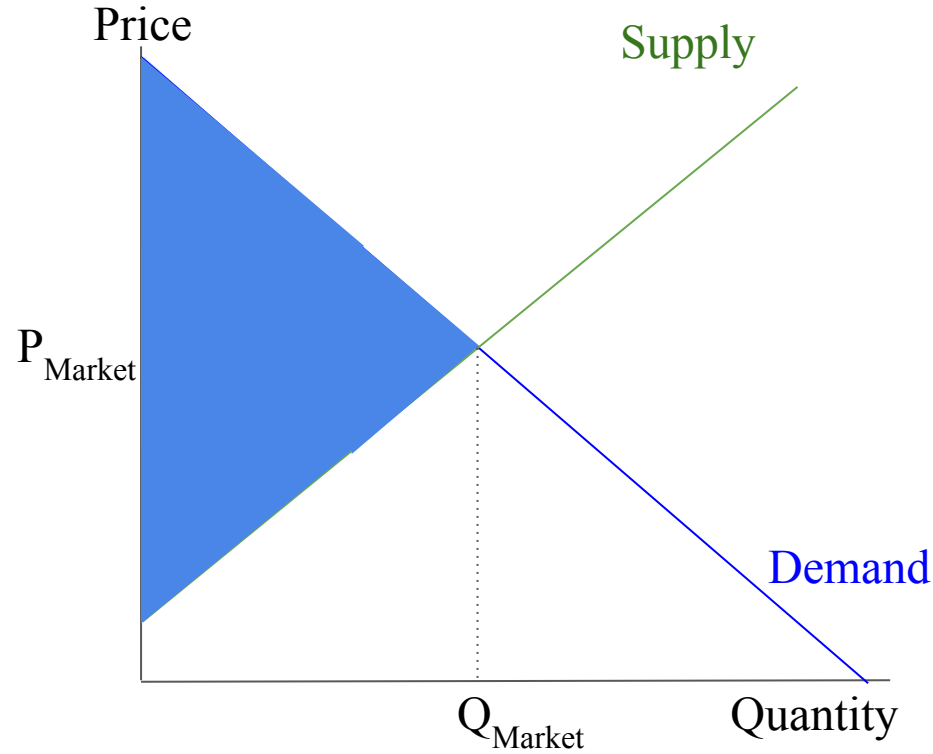
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 - “It cost me \$6 to make, but I sold it for \$8 – that’s \$2 of surplus.”
- Producer Surplus is the price in excess of Marginal Cost across all units sold



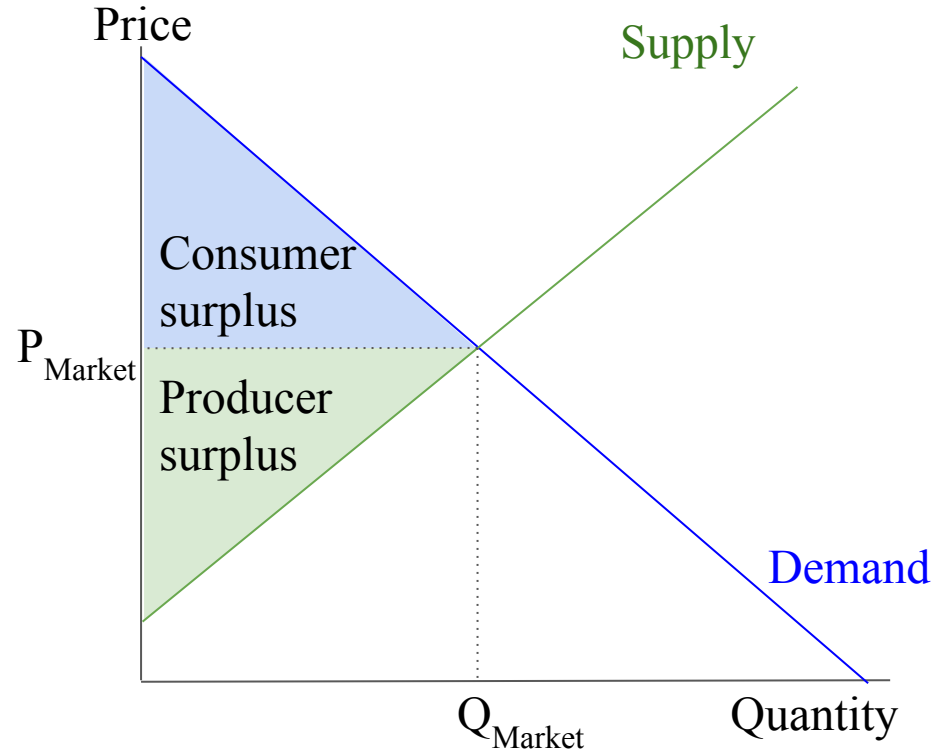
Efficiency and Surplus

- The market is efficient



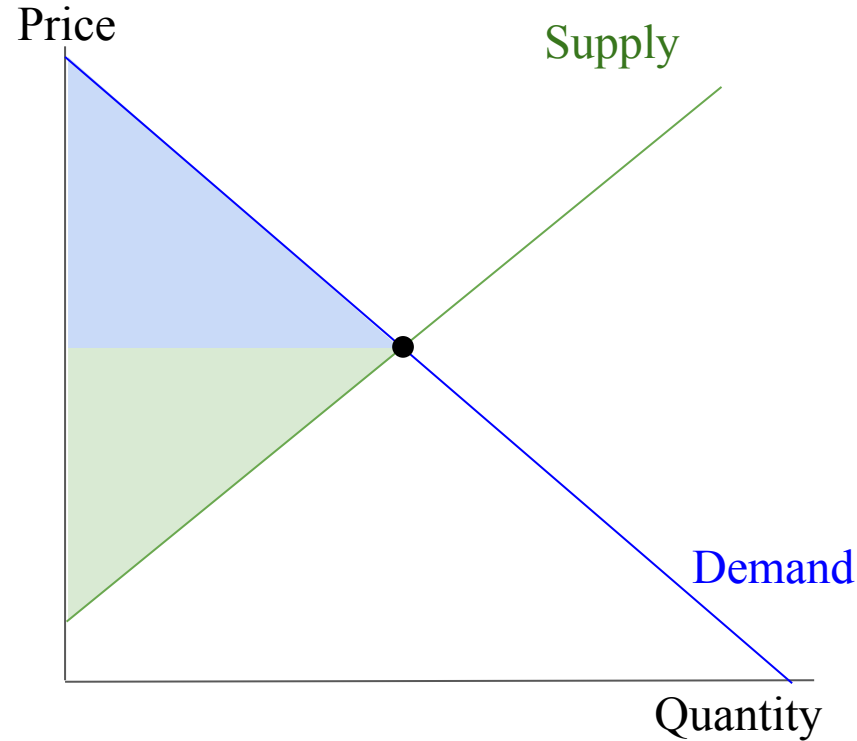
Efficiency and Surplus

- The market is efficient
- The market maximizes $PS + CS$
 - Same thing



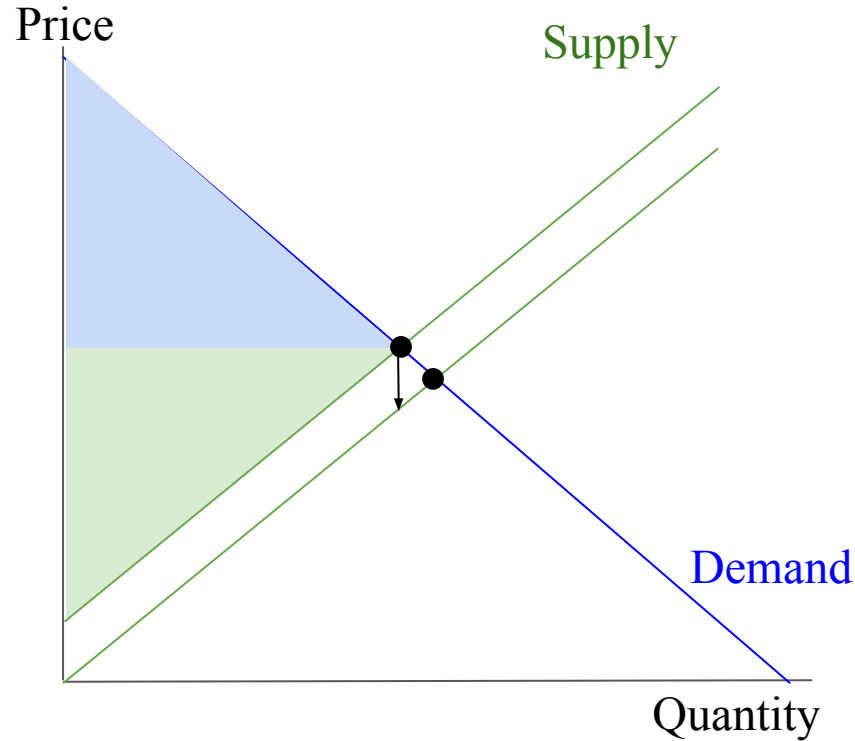
Efficiency and Surplus After a Shock

- What if producers' costs fall?



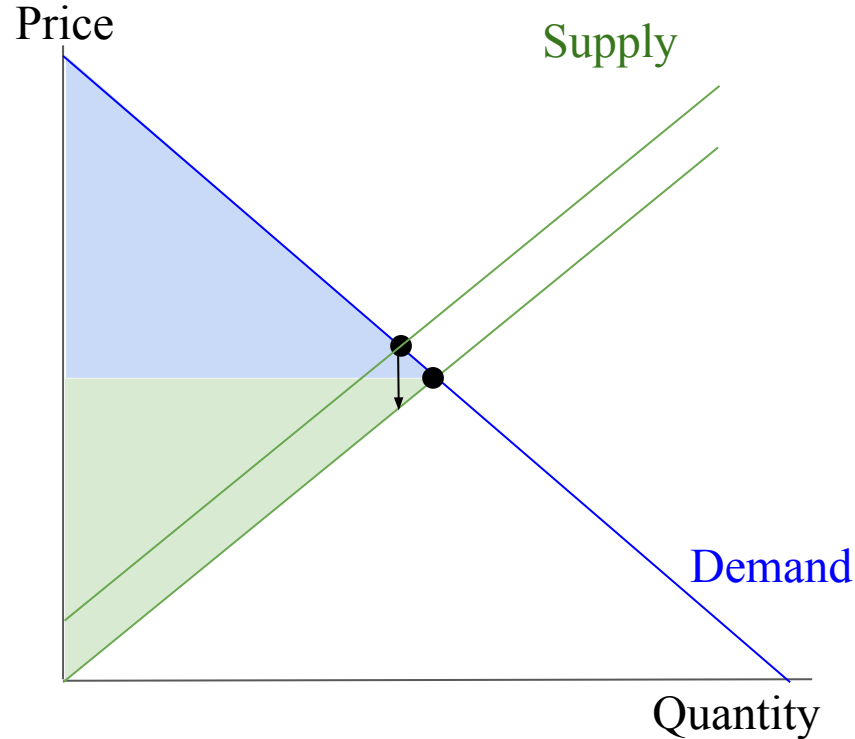
Efficiency and Surplus After a Shock

- What if producers' costs fall?
- Supply Curve shifts down/right
- Lower Price, higher Quantity



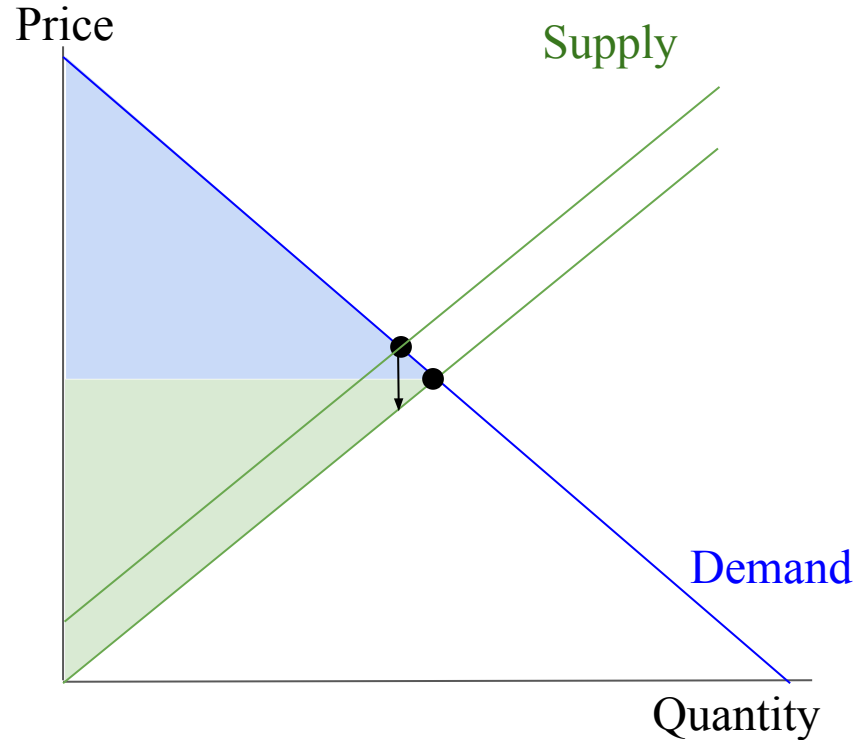
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 - Consumers get more at a lower price
- What about PS?
 - More sales, but at a lower price...



Efficiency and Surplus After a Shock

- What if producers' costs fall?
- Supply Curve shifts down/right
- Lower Price, higher Quantity
- CS clearly increases
 - Consumers get more at a lower price
- What about PS?
- More sales, but at a lower price...
- PS increases, too!
 - Decrease in price is smaller than the decrease in cost
 - So PS per unit also increased
 - PS rises
- Lesson: lower costs benefit both consumers and producers



Social Surplus Application: International Trade

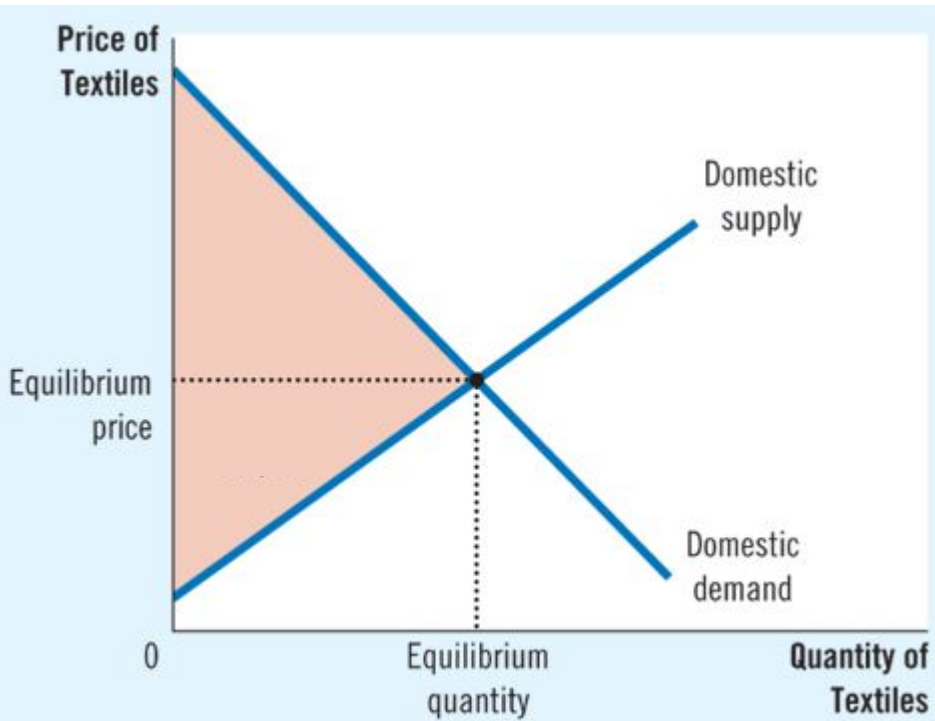
International Trade

- International trade has long been a controversial topic
- Advocates argue that it makes the world richer
- Critics argue that many people are left out of the benefits – and in fact get harmed
- Our tools allow us to analyze this debate rigorously

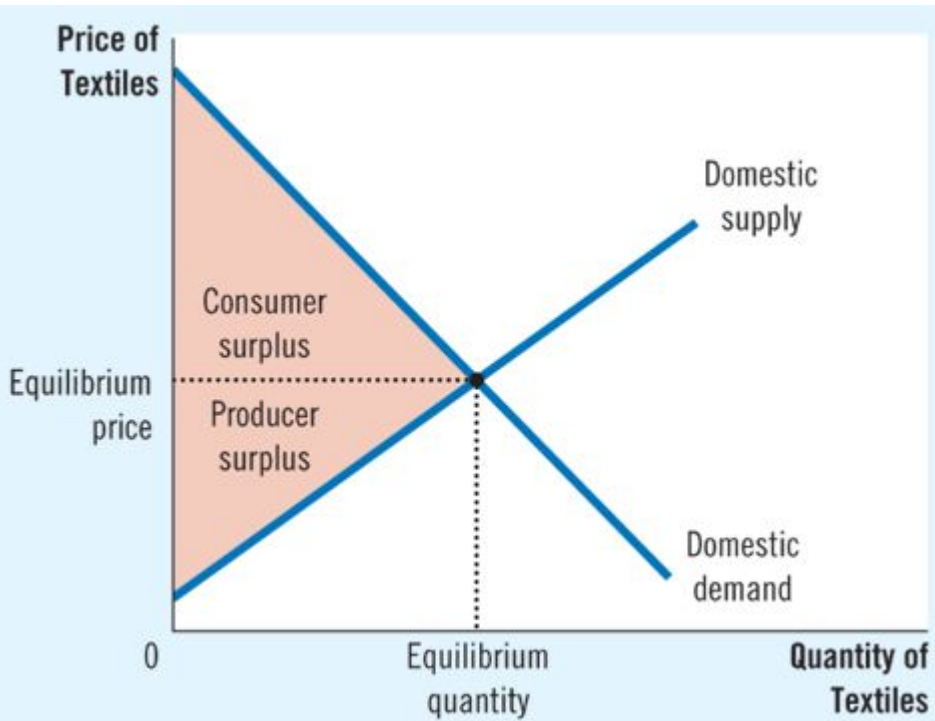
Smallville

- Consider the market for textiles (e.g. clothing) in Smallville
- We are going to study this market under 2 scenarios:
 1. No trade (Autarky): Smallville exists in isolation
 2. Trade
 - Consumers in Smallville can buy from producers in the rest of the world (RoW)
 - Producers in Smallville can sell to consumers in the rest of the world (RoW)
 - Simplifying assumption: Smallville is so small that its entry to the world market does not affect the world's price

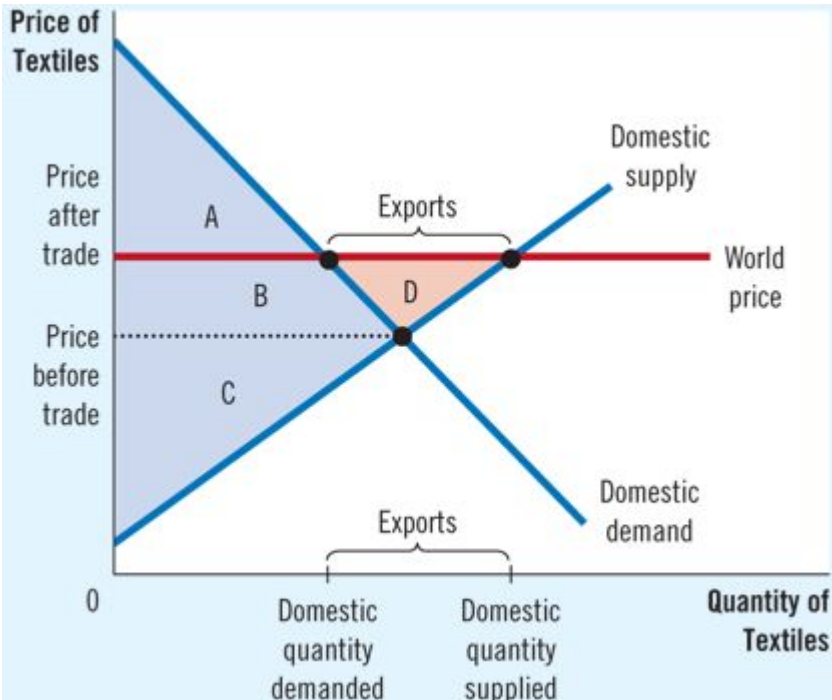
No Trade



No Trade

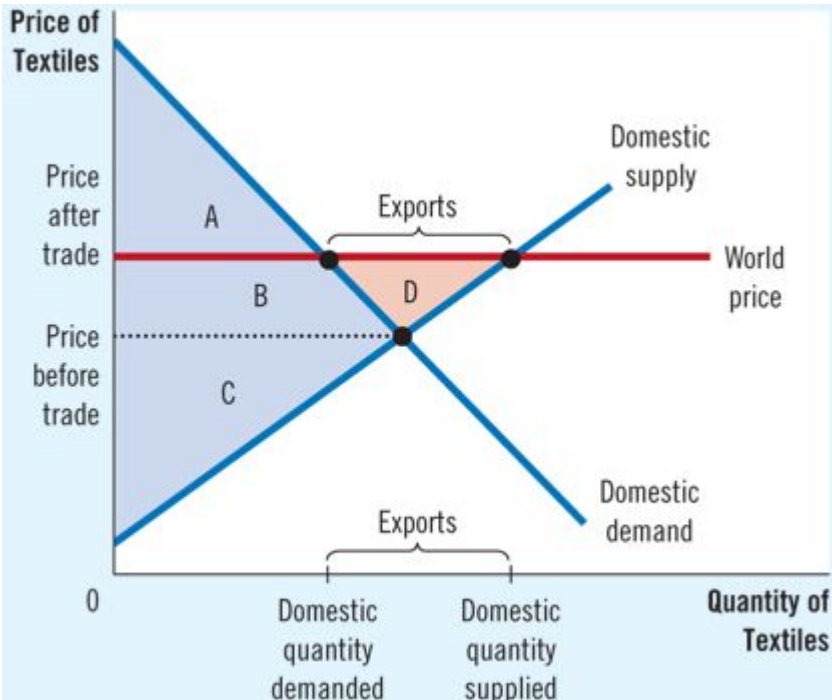


Trade: High World Price



- International trade has a big impact
 - Price no longer determined by S&D
 - Smallville is a Price Taker
- High price increases S and decreases D
 - Surplus is exported

Trade: High World Price

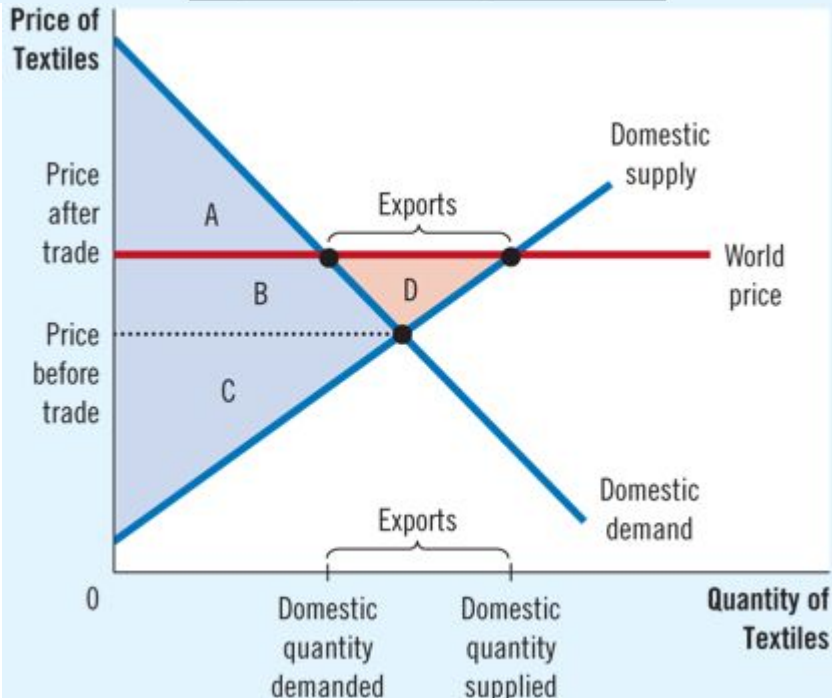


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- How does Consumer Surplus change?
- How does Producer Surplus change?
- How does Smallville's Social Surplus change?

Trade: High World Price

	Before Trade	After Trade	Change
Consumer Surplus	A + B	A	-B
Producer Surplus	C	B + C + D	+ (B + D)
Total Surplus	A + B + C	A + B + C + D	+D

The area D shows the increase in total surplus and represents the gains from trade.

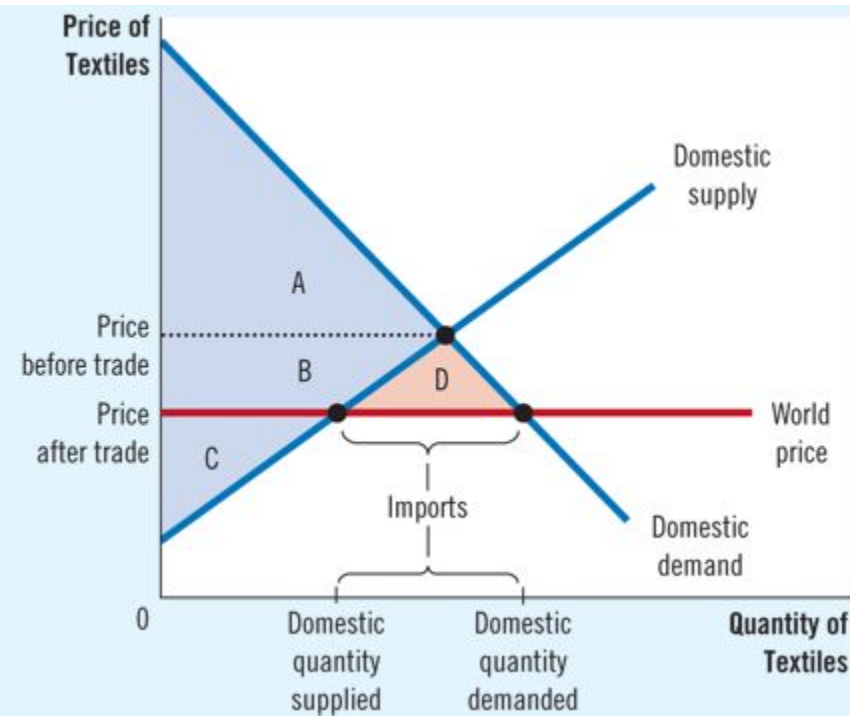


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International Trade Has Varied Impacts

- International trade makes the world richer, including Smallville
 - Smallville can produce textiles more cheaply than RoW
 - Comparative Advantage: produce more textiles and sell them!
 - RoW is willing to pay high price for those textiles, which benefits Smallville
 - Increase in Social Surplus
- But not everyone within Smallville benefits
 - Consumer Surplus fell due to the higher price
 - Domestic consumers have to compete with international consumers willing to pay high prices

Trade: Low World Price

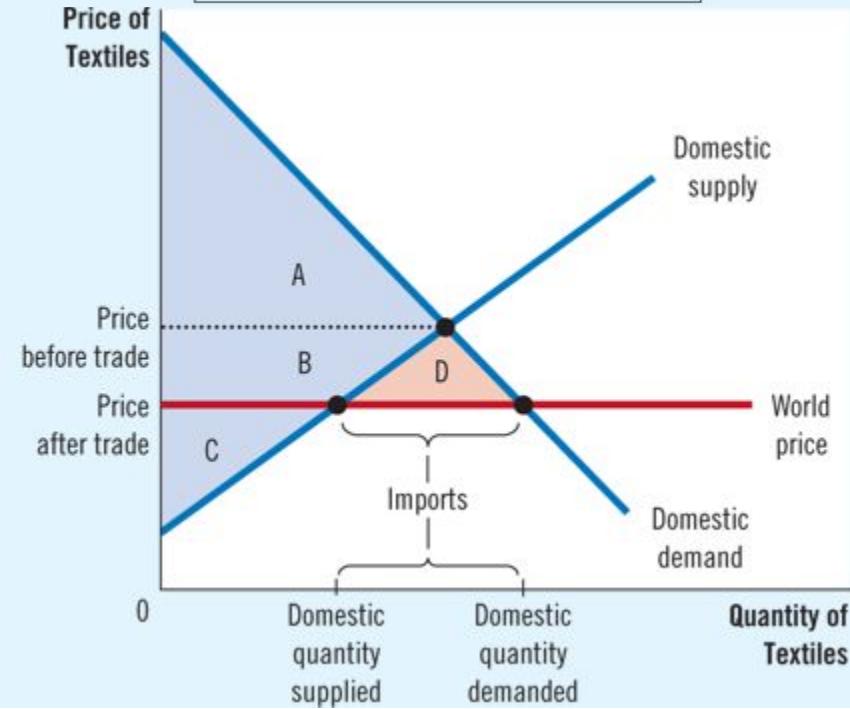


- Low price increases D and decreases S
 - Imports fill in the Shortage
- How does Consumer Surplus change?
- How does Producer Surplus change?
- How does Smallville's Social Surplus change?

Trade: Low World Price

	Before Trade	After Trade	Change
Consumer Surplus	A	A + B + D	+ (B + D)
Producer Surplus	B + C	C	-B
Total Surplus	A + B + C	A + B + C + D	+ D

The area D shows the increase in total surplus and represents the gains from trade.



- Low price increases D and decreases S
 - Imports fill in the Shortage
- How does Consumer Surplus change?
- How does Producer Surplus change?
- How does Smallville's Social Surplus change?

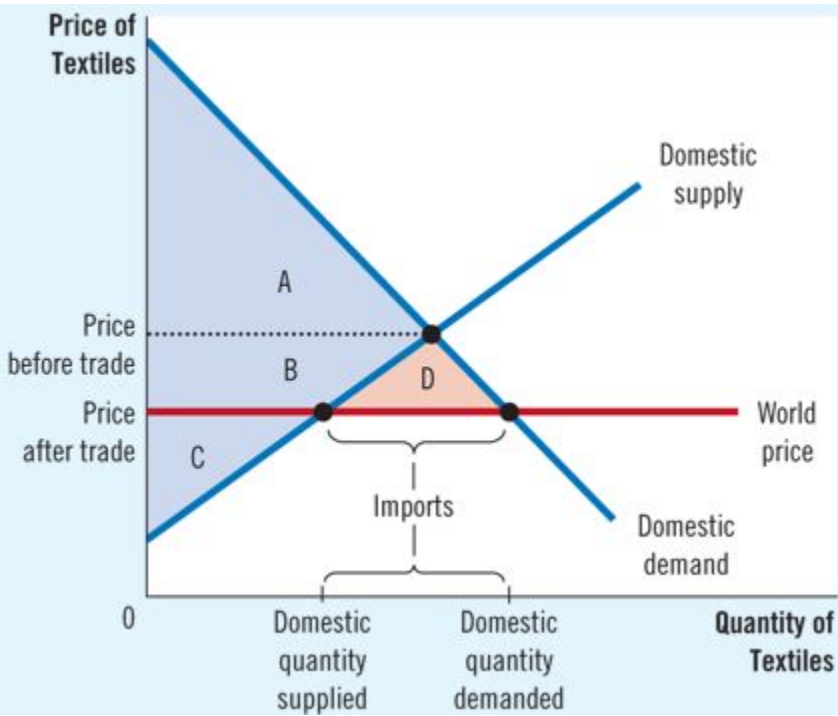
International Trade Has Varied Impacts (2)

- International trade makes the world richer, including Smallville
 - Smallville is not as good at making textiles as RoW
 - Comparative Advantage: produce fewer textiles and buy them!
 - RoW is willing to sell those textiles at a low price, which benefits Smallville
 - Increase in Social Surplus
- But not everyone within Smallville benefits
 - Producer Surplus fell due to the lower price
 - Domestic producers have to compete with international producers with low costs who can charge low prices

Efficiency vs. Distribution

- An efficient outcome has “the biggest pie” possible
- But some efficient outcomes lead to very unequal distributions of surplus
 - E.g. if world price is very high, international trade will:
 - Enrich the people who own production facilities
 - Harm consumers
- The following argument is often made in favor of efficiency:
 - “We should always maximize efficiency, because by making the pie as big as possible, we can redistribute to make everybody better off.”
- The statement is true, but in practice the redistribution often fails to happen
- If globalization had been better-paired with policies to help those who were harmed, it would probably be more popular.
- We will discuss redistributive policy later in the semester.
- We’ll introduce government policy more formally next week, but here’s a taste:

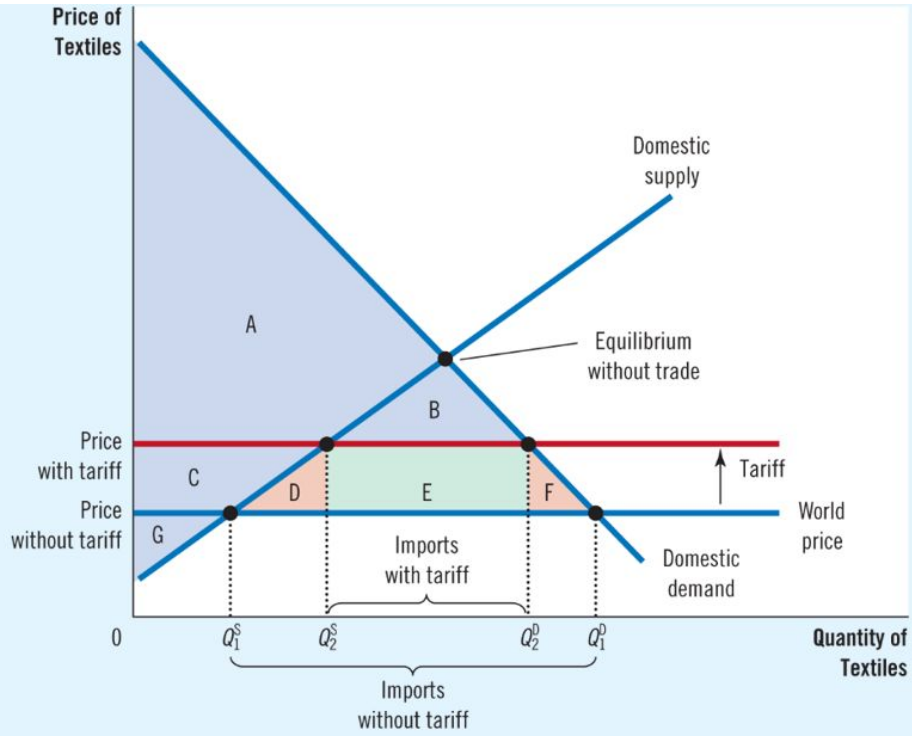
Tariffs



- A Tariff is a tax on imports.
- Tariffs have re-emerged in policy discussions. What are the consequences?

Tariffs

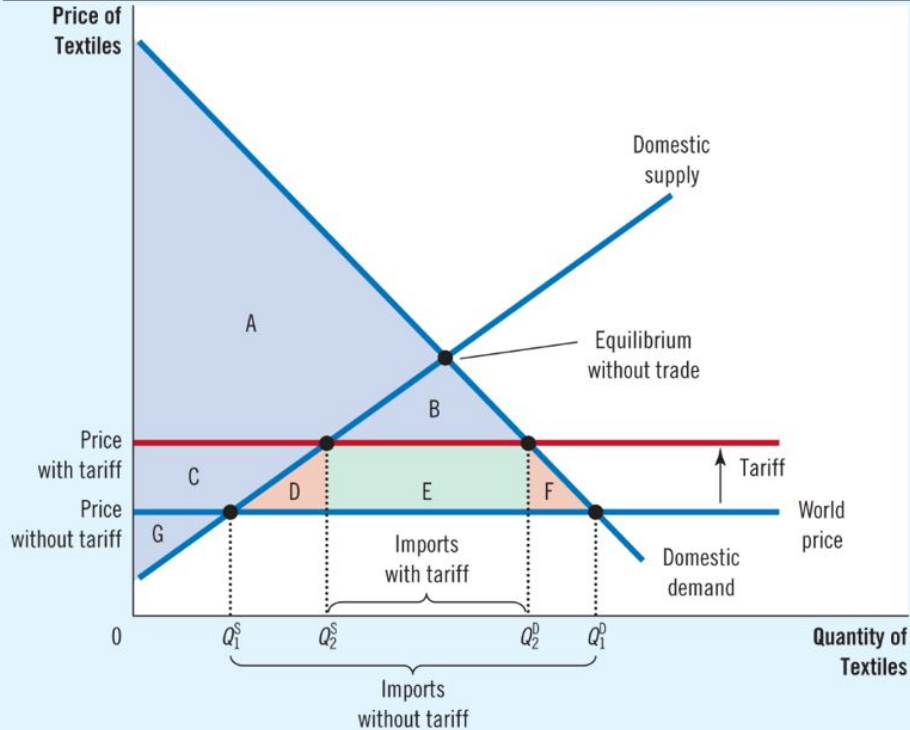
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Tariffs

	Before Tariff	After Tariff	Change
Consumer Surplus	$A + B + C + D + E + F$	$A + B$	$-(C + D + E + F)$
Producer Surplus	G	$C + G$	$+ C$
Government Revenue	None	E	$+ E$
Total Surplus	$A + B + C + D + E + F + G$	$A + B + C + E + G$	$-(D + F)$

The area $D + F$ shows the fall in total surplus and represents the deadweight loss of the tariff.



- A Tariff is a tax on imports.
- Tariffs have re-emerged in policy discussions. What are the consequences?
- Increased price mitigates some of the impacts of international trade
- Government raises money (E)
- Social Surplus falls (D+F)