

Principles of Economics

Discussion Session 12: International Trade

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Why trade?

- **Autarky:** The state of total trade isolation. No goods cross borders.

David Ricardo (1817):

- Suppose England and Portugal can both produce wine and cloth, but Portugal is more productive at producing both.
- What could Portugal gain from trading with England?

Comparative Advantage

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- Suppose this table gives the hours of labor required to produce one unit of wine and cloth in England and Portugal.

Country	Cloth	Wine
England	15	20
Portugal	10	10

- Portugal has an *absolute advantage* in each: producing both wine and cloth is less costly in Portugal than in England.

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- Portugal has an *absolute advantage* in each: producing both wine and cloth is less costly in Portugal than in England.
- But England has a *comparative advantage* in cloth: the opportunity cost of producing cloth is lower in England than in Portugal.
 - In Portugal, producing 1 unit of cloth means forgoing $\frac{10}{10} = 1$ unit of wine.
 - In England, producing 1 unit of cloth means forgoing $\frac{15}{20} = 0.75$ units of wine.

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 - In Portugal, producing 1 unit of cloth means forgoing $\frac{10}{10} = 1$ unit of wine.
 - In England, producing 1 unit of cloth means forgoing $\frac{15}{20} = 0.75$ units of wine.
- ⇒ The autarky price of cloth is lower in England than in Portugal.
- ⇒ Both countries benefit from specializing in their comparative advantage and trading with each other

Direction of Trade Flows

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Direction of Trade Flows

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- Portugal has comparative advantage in wine.

- ⇒ In *autarky*, the price of cloth is lower in England than in Portugal.
- ⇒ Under free trade, England will export cloth to Portugal and import wine from Portugal.
- In general, under free trade, **each country will export its comparative advantage and import its comparative disadvantage.**

Exercise 1: Comparative Advantage

- The following table gives autarky equilibrium prices for automobiles in the US and Mexico (both in USD).

Country	Automobile Price
United States	45,000
Mexico	40,000

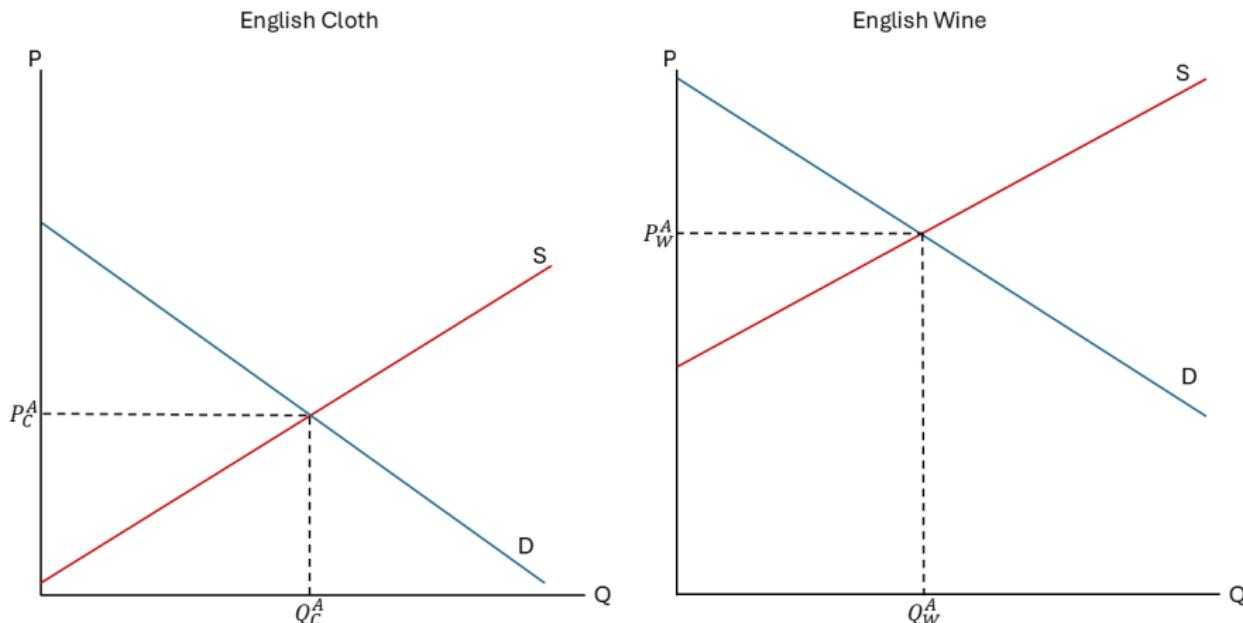
- Which country has the comparative advantage in automobiles?
- Will the US export or import automobiles?

Exercise 1: Comparative Advantage

Solution:

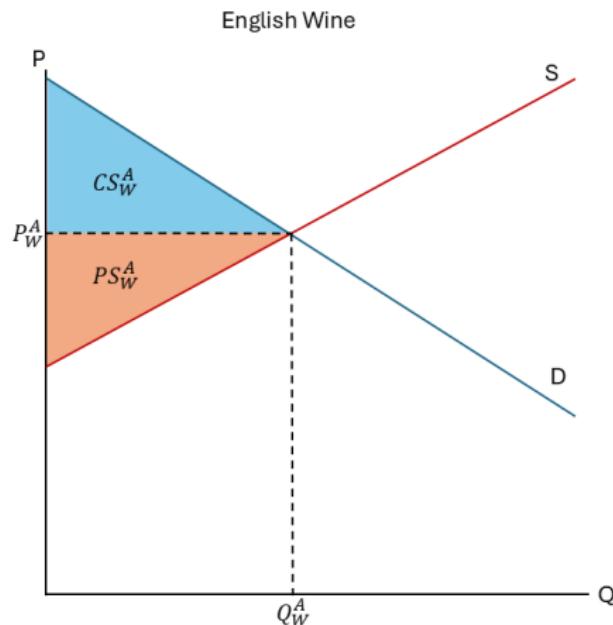
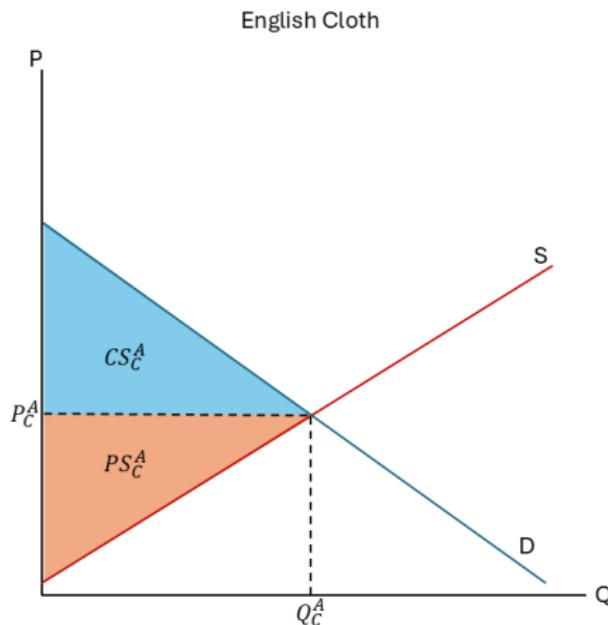
- ① $40,000 < 45,000$, so Mexico has the comparative advantage in automobile production.
- ② The US will import automobiles.

Gains from Trade



The above figure shows the autarky equilibria for the English cloth and wine markets.

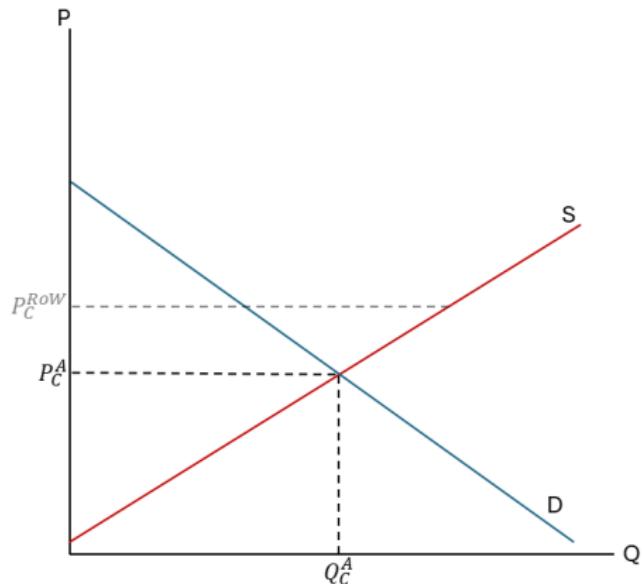
Gains from Trade



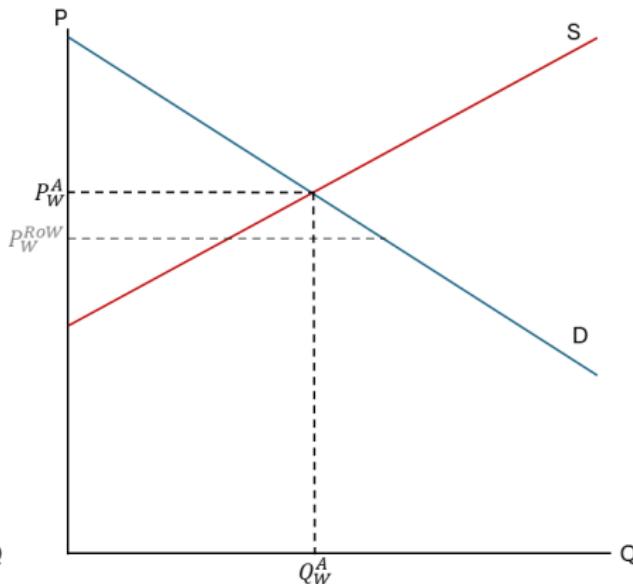
Autarky CS and PS are calculated as usual.

Gains from Trade

English Cloth



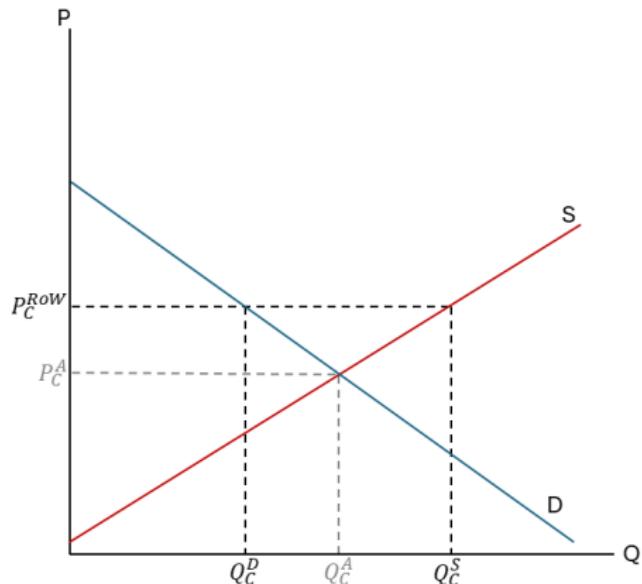
English Wine



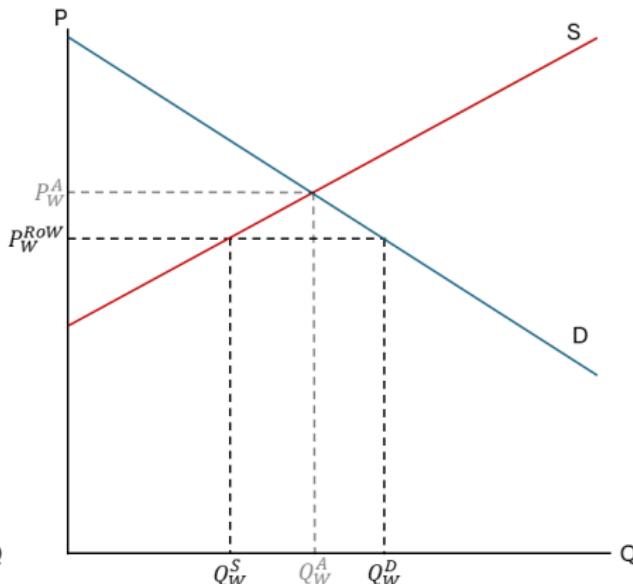
Now introduce the prices for "Rest of World".

Gains from Trade

English Cloth



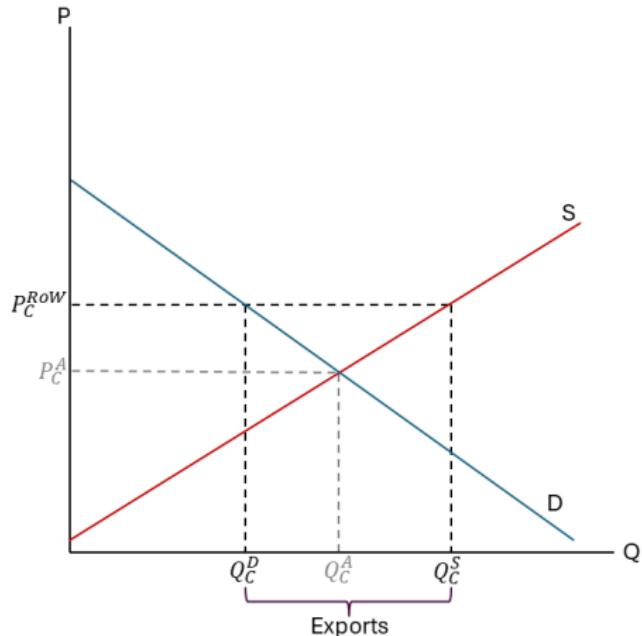
English Wine



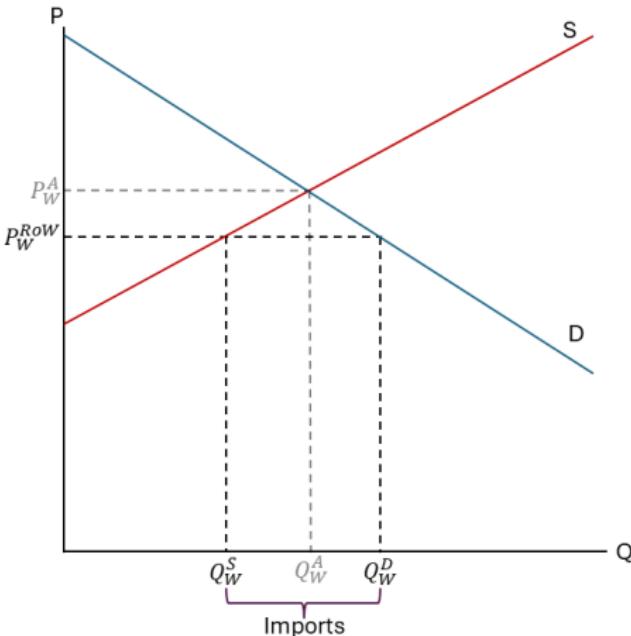
Suppose England abandons autarky for free trade. English buyers and sellers now use *RoW* prices.

Gains from Trade

English Cloth



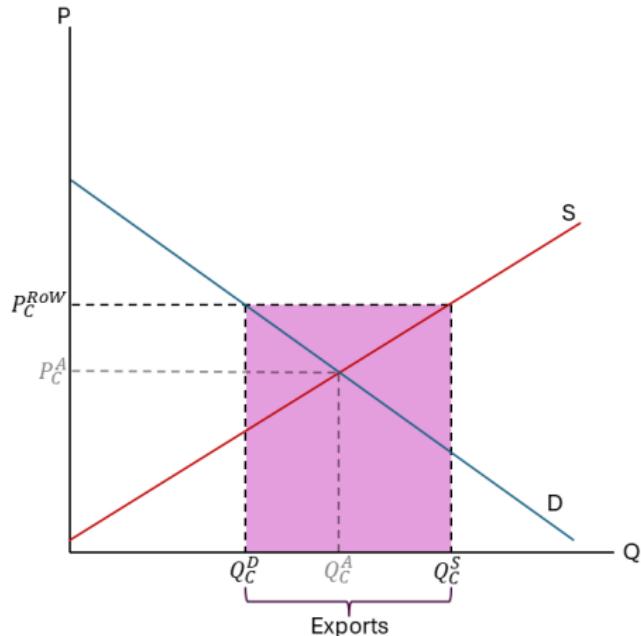
English Wine



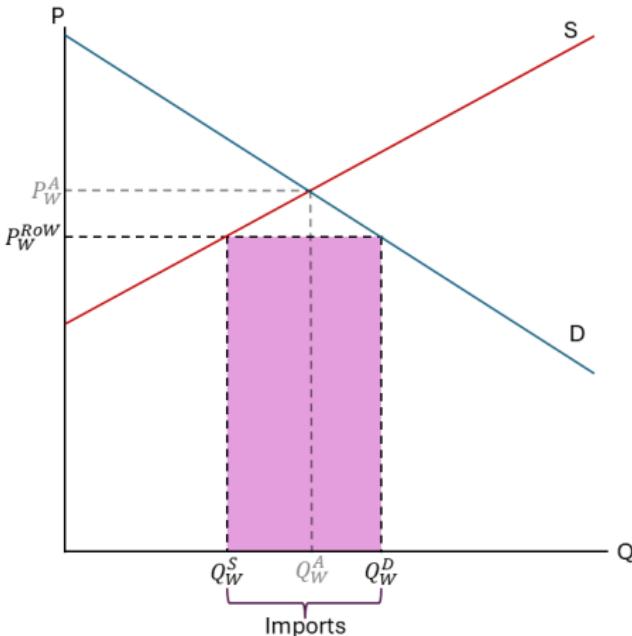
The differences between quantities supplied and demanded by English producers and consumers are made up by exports and imports.

Gains from Trade

English Cloth



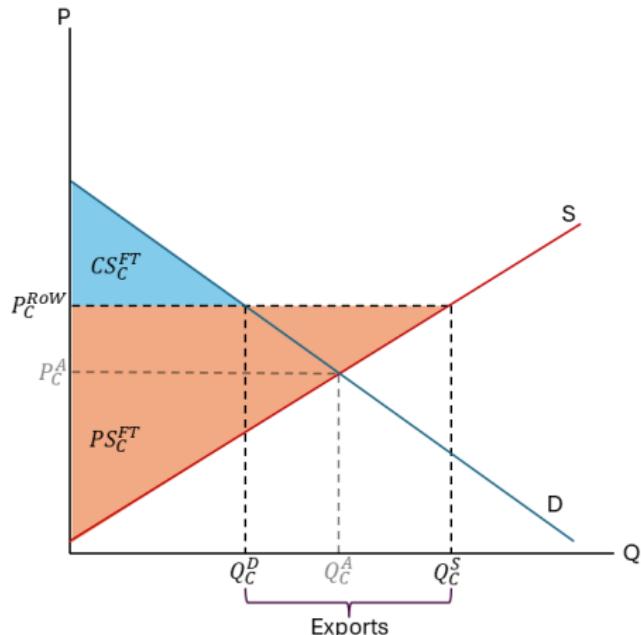
English Wine



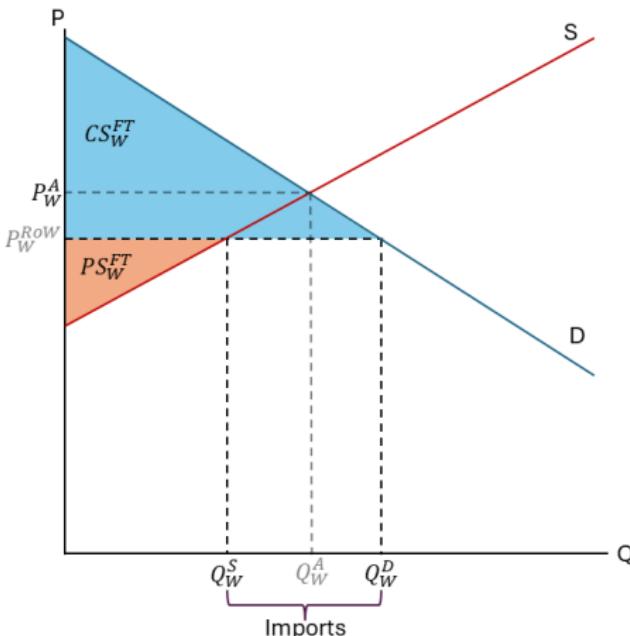
Balanced Trade: The value of all exports equals the value of all imports. \implies If the only goods that England trades are cloth and wine, then the areas of the pink rectangles must be equal.

Gains from Trade

English Cloth



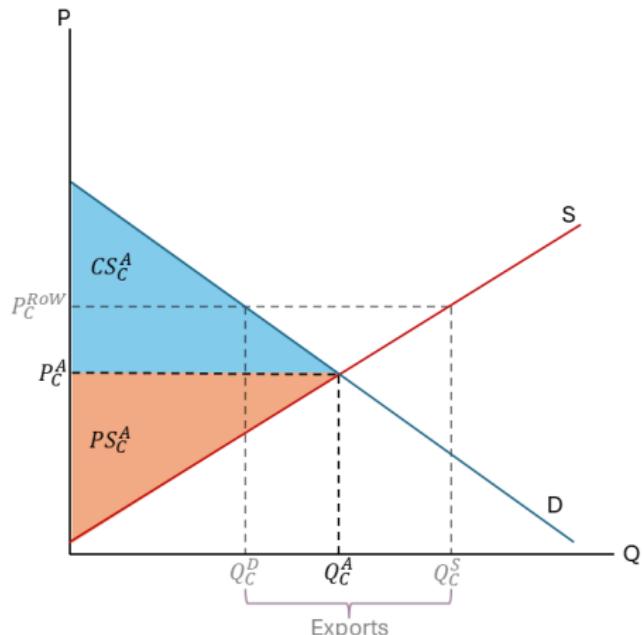
English Wine



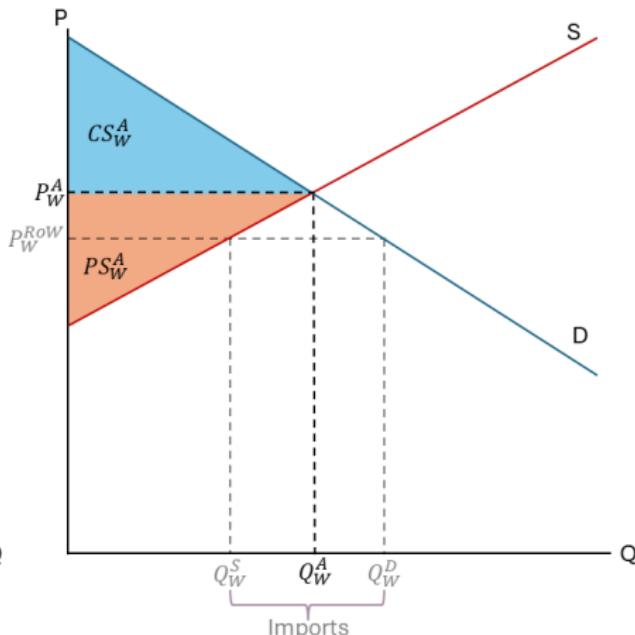
CS is the difference between the demand curve and the *RoW* price.
PS is the difference between the *RoW* price and the supply curve.

Gains from Trade

English Cloth



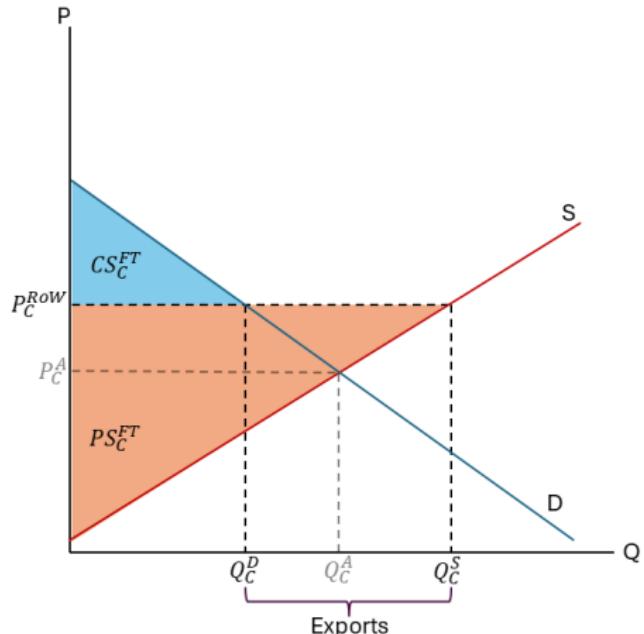
English Wine



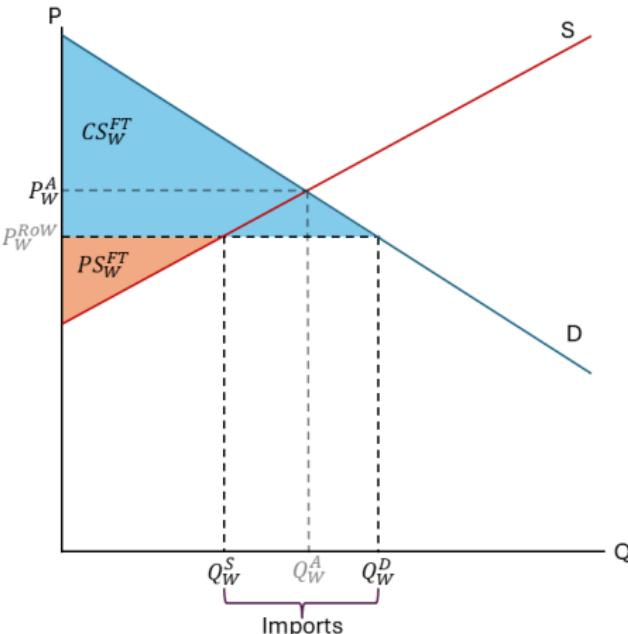
To recap, this is CS and PS under autarky.

Gains from Trade

English Cloth



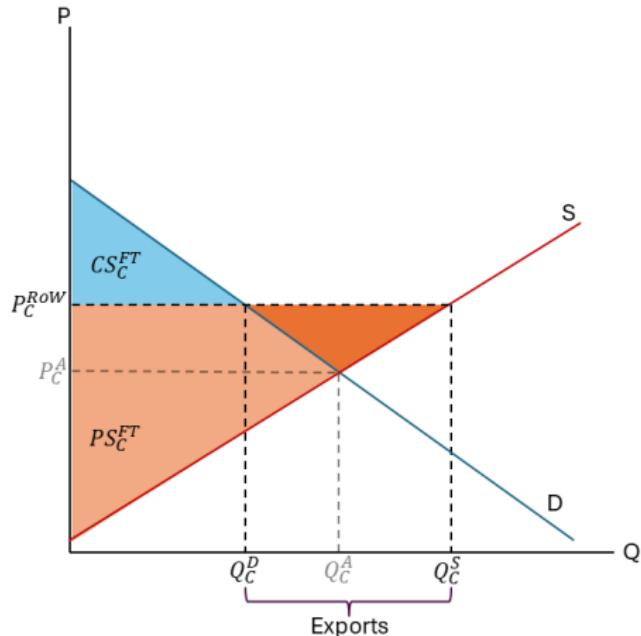
English Wine



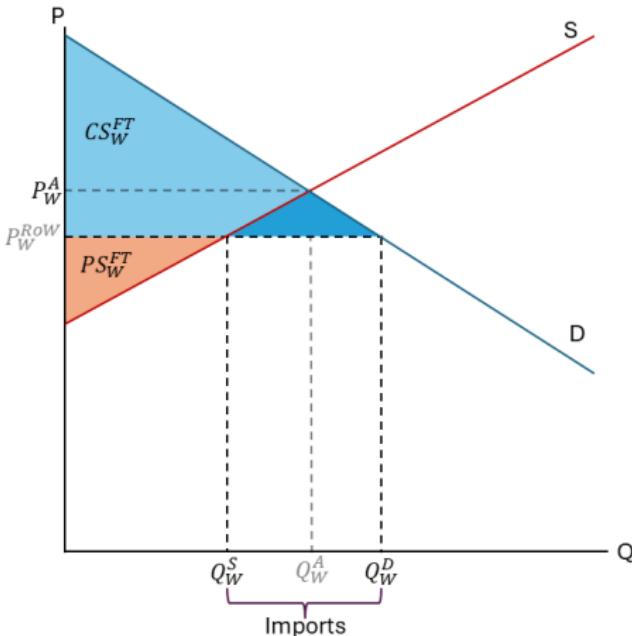
Free trade increases PS and reduces CS for the country's comparative advantage good.
Free trade reduces PS and increases CS for the country's comparative disadvantage good.

Gains from Trade

English Cloth



English Wine



The addition of the dark triangles guarantees that the gains to the winners are greater than the losses to the losers.

Exercise 2: Gains from Trade

Consider the market for automobiles in the US under autarky:

- $Q^S = P - 20,000$
- $Q^D = -\frac{1}{2}P + 40,000$

- ① What are the autarky equilibrium price and quantity?
- ② What are CS and PS?

Now suppose the *Rest of World* price is \$30,000 and the US adopts free trade. Assume for the sake of simplicity that the US is a 'small country'.

- ③ Does the US have a comparative advantage in automobiles?
- ④ What are the new quantities supplied and demanded?
- ⑤ How many cars does the US import or export?
- ⑥ What is the change in CS and PS from the autarky equilibrium??
- ⑦ What is the change in total surplus?

Exercise 2: Gains from Trade

Solution:

- ① $P^A = 40,000$ and $Q^A = 20,000$.
- ② $CS^A = \frac{1}{2} \times 20,000 \times 40,000 = 400,000,000$ and
 $PS^A = \frac{1}{2} \times 20,000 \times 20,000 = 200,000,000$.
- ③ No. The RoW price is lower than the US autarky price.
- ④ $Q^S = (30,000) - 20,000 = 10,000$ and $Q^D = -\frac{1}{2}(30,000) + 40,000 = 25,000$.
- ⑤ The US imports $Q^D - Q^S = 15,000$ automobiles.
- ⑥ $CS^{FT} = \frac{1}{2} \times 25,000 \times 50,000 = 625,000,000$ and
 $PS^{FT} = \frac{1}{2} \times 10,000 \times 10,000 = 50,000,000$.
⇒ CS increases by \$225 million and PS decreases by \$150 million.
- ⑦ Total surplus increases by \$75 million.

- We've seen that free trade creates winners and losers.
 - The losses to the losers are smaller than the gains to the winners.
 - Free trade is beneficial on net.
- If the losers are organized, they may lobby for **protectionism**: governmental policies that restrict trade in order to benefit certain groups.
- The previous problem concerned automobile manufacturing:
 - Consumers benefit from free trade, but organization of US car-buyers is difficult.
 - American auto manufacturers and labor suffer from free trade; organization is easy.
 ⇒ Those organized groups lobby for protectionist policies.

Tariffs

- The most common protectionist policy is a **tariff**: a tax on imported goods.
- The effect of a tariff is much the same as a tax:
it raises the price to the buyers and decreases the quantity sold.
- Tariffs effectively push us back toward the autarky equilibrium, reversing both the harmful and beneficial effects of free trade.

Lobbying for Tariffs

AFTER MEMBERS TOOK ACTION, UAW CELEBRATES TARIFFS ON HEAVY TRUCKS

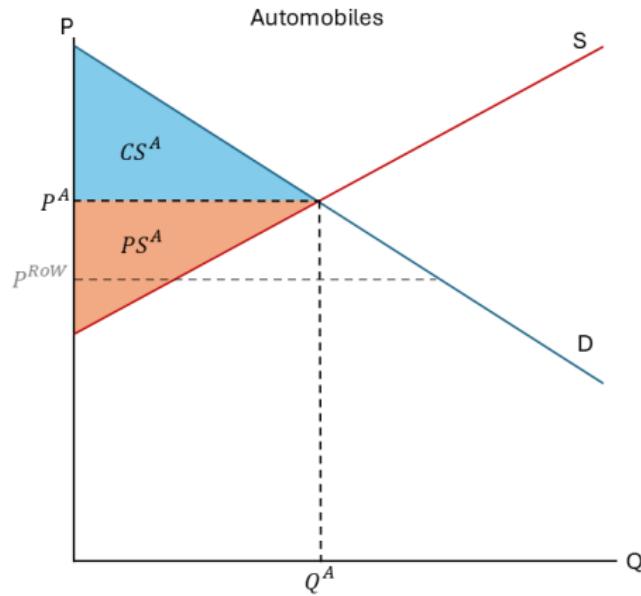


In a major win for UAW members who build heavy trucks at Mack, Daimler, Navistar, Volvo, and more, the Trump administration has announced a 25 percent tariff on imported heavy trucks, after a massive grassroots lobbying campaign by UAW members and leaders.

"For decades, heavy truck makers have rushed to kill good blue-collar jobs from Allentown, Pennsylvania, to Gastonia, North Carolina, in order to pay poverty wages abroad while Wall Street makes a killing. That ends November 1st," said **UAW President Shawn Fain**. "Our members lobbied and mobilized to save these communities, and made their voices heard in Washington, DC. We have pushed for action like this for decades, and we congratulate President Trump for delivering for heavy truck workers everywhere. Let's keep going and rewrite our broken trade rules."

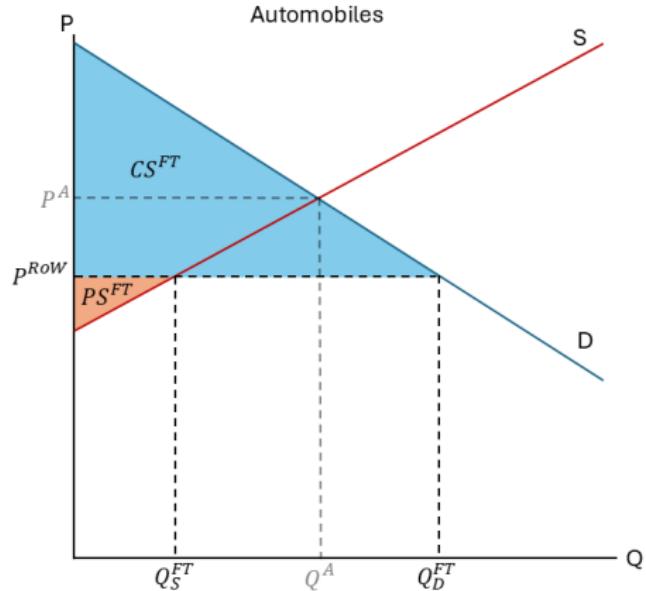
Figure: From UAW.org

Tariffs Graphically



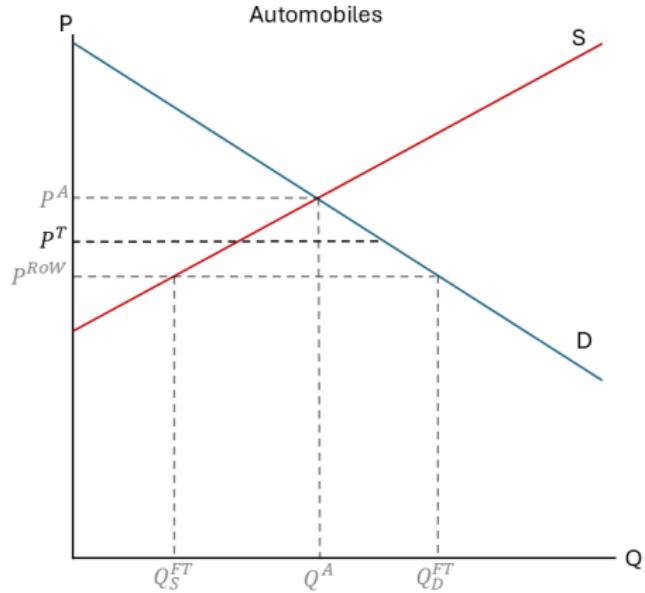
Consider the autarky equilibrium for automobiles in the US, with *Rest of World* price P^{RoW} .

Tariffs Graphically



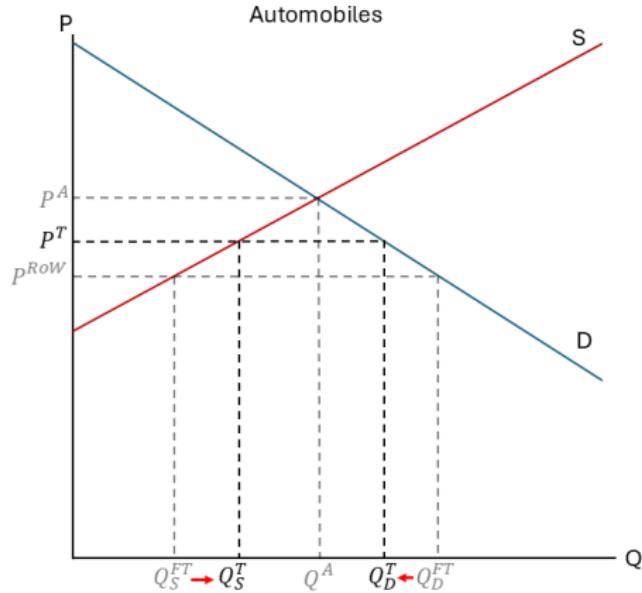
Under free trade, Americans use P^{RoW} , so CS expands and PS contracts.

Tariffs Graphically



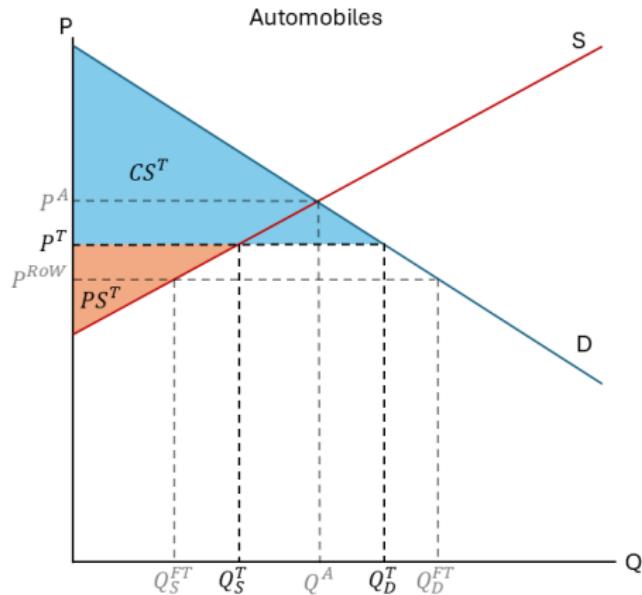
Suppose the government introduces a tariff, which raises the domestic price to $P^T \in (P^{RoW}, P^A)$.

Tariffs Graphically



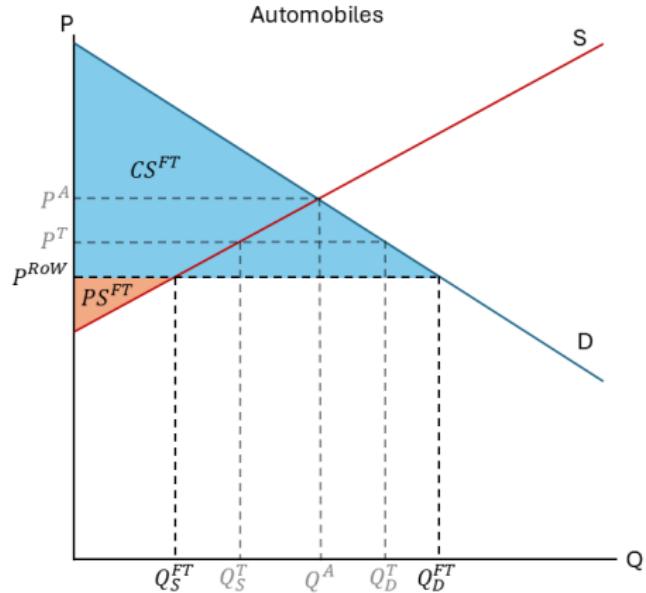
The higher price causes Q_S and Q_D to move inward toward the autarky quantity Q^A .

Tariffs Graphically



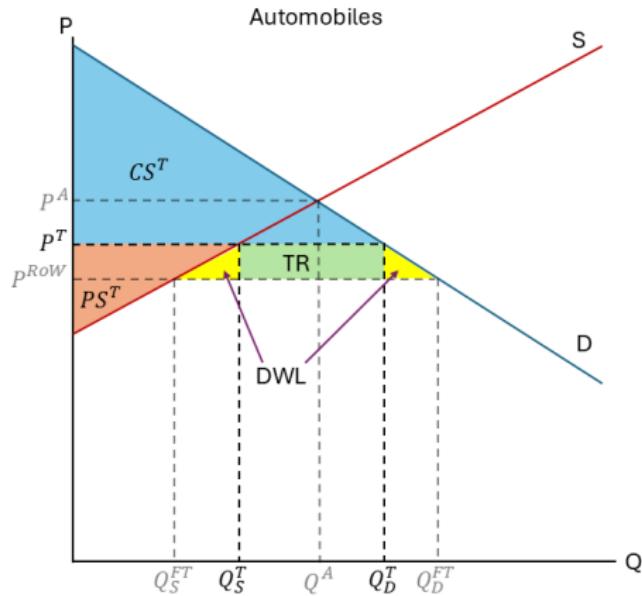
After the tariff, the surplus triangles are formed by P^T , Q_S^T , and Q_D^T .

Tariffs Graphically



Recall: this is the free trade surplus.

Tariffs Graphically



The tariff causes PS to increase and CS to decrease.

Some of the lost CS is converted to tax revenue, and the rest is deadweight loss.

Exercise 3: Tariffs

Consider the same hypothetical US auto market as Exercise 2:

- $Q^S = P - 20,000$
- $Q^D = -\frac{1}{2}P + 40,000$
- $P^{RoW} = 30,000$, $Q_S^{FT} = 10,000$, $Q_D^{FT} = 25,000$.
- $CS^{FT} = \$625$ million
- $PS^{FT} = \$50$ million

Suppose the government imposes a tariff which raises the price to $P^T = 34,000$.

- ① Calculate CS^T and PS^T .
- ② Calculate tax revenue.
- ③ Calculate deadweight loss.
- ④ By how much does total surplus (including tax revenue) change from the free trade equilibrium?

Exercise 3: Tariffs

Solution:

① $CS^T = \frac{1}{2} \times 23,000 \times 46,000 = 529,000,000.$

$$PS^T = \frac{1}{2} \times 14,000 \times 14,000 = 98,000,000.$$

② $TR = (23,000 - 14,000) \times (34,000 - 30,000) = 36,000,000.$

③ $DWL = \left(\frac{1}{2} \times 4,000 \times 4,000\right) + \left(\frac{1}{2} \times 2,000 \times 4,000\right) = 12,000,000$

④ $\Delta TS = 663 \text{ million} - 675 \text{ million} = -12 \text{ million.}$ (Note that this is equal to DWL).