

# Mercantilism and the Navigation Acts

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## Mercantilism

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- Mercantilists think that the gains from trade arise solely from exporting and that international trade is largely a zero-sum game: I win, you lose.
- Direct consequence: a desire to have specie (gold) flow into the royal treasury and for gold to flow into your country (in this case, England/Britain) more generally.
- Gold can finance wars and colonialization.
- English efforts at colonization were not generally financed directly by the government. Rather the government licensed monopolies to colonize their reward was monopoly rents, some of which flowed back to the crown.

# CLASHING OVER COMMERCE

★ A History of US Trade Policy ★

DOUGLAS A. IRWIN



# The Navigation Acts

- The Navigation Acts were a way of rewarding English commercial enterprises for colonization and increasing English commerce at the expense of the Dutch, who in the 17th century were the dominant world traders.
- The series of Acts passed in the 17th and 18th centuries began in 1651:
  1. They regulated English ships, trade, and commerce between England, her colonies, and other countries.
  2. Broadened in 1660, 1663, 1673, 1696, 1733, and most importantly in the 1760s when direct taxation of colonial revenue was imposed.
  3. Those latter taxes violated colonial understanding of the acts, which were more or less begrudgingly followed.
  4. The taxes play a major role in the desire for independence (exactly how they do so is more complex than it seems).

# Navigation Act of 1651

- *An Act for increase of Shipping, and Encouragement of the Navigation of this Nation.*
- Enacted under the Commonwealth, motivated by the economic consequences of the end of the Eighty Years' War.
- Thus, directed at expanding English shipping at the expense of the Dutch.
- If built on an old English (and European) tradition of managed international trade.
- Three pillars:
  1. It banned foreign ships from transporting goods from Asia, Africa, or America to England.
  2. Foreign European ships could only carry goods from their own country to England: no third party shipping.
  3. Prohibited foreign shipping of salted fish to England and shipping from one English port to another.

# Navigation Act of 1660

- *An Act for the Encouraging and increasing of Shipping and Navigation.*
- Product of the Restoration of Charles II.
- Colonial imports and exports solely on English or colonial-owned ships with 75% English crews.
- Seven enumerated goods that must go on an English ship (sugar, tobacco, cotton wool, indigo, ginger, fustic, or other dyeing woods; cocoa beans added in 1672).
- Complementary acts:
  1. *Customs Act 1660*: Stipulates the collection of custom duties.
  2. *Tobacco Planting and Sowing Act 1660*: Prohibit growing tobacco in England or Ireland aids colonial plantations. Why?

- 1663:
  1. European goods with destination to the colonies need to be shipped first to England, where duties are paid.
  2. Conversely, enumerated goods from the colonies had to be shipped first to England before re-export.
  3. Exceptions: salt bound for New England and Newfoundland fisheries, wine from Madeira and the Azores, and provisions, servants, and horses from Scotland and Ireland.
- 1673:
  1. Establishes customs offices in the colonies to more effectively collect duties.
  2. Relaxes regulation of whaling.

- 1696:
  1. No goods, whatsoever, can be shipped between English possessions or to England except in ships built in England or the colonies and owned by residents in those respective places.
  2. Requires ship registrations.
  3. Gives colonial custom officers same authority as those in England.
  4. Establish more admiralty courts to aid in enforcement.
- *Tobacco planting and Plantation Act of 1696*:
  1. Imposes forfeiture if any enumerated good is shipped without a customs certificate.
  2. Trials take place in admiralty courts.

## Further evolution

- Apply to Scotland after *Act of Union of 1707*.
- Initially colonists disregard many aspects of the acts by trading with the Dutch.
- Over time more adherence, and, by early 1700s, pretty much in conformity (act in 1696 requiring registration of ships).
- *Molasses Act of 1733*.
  1. Heavy duties on sugar from French West Indies (more efficient sugar plantations) to colonies forcing colonists to buy more expensive sugar from British West Indies.
  2. Law is flouted and British anti-smuggling attempts create hostility.
  3. Renewed as *Sugar Act of 1764*.
  4. Sets precedent for later acts such as *Stamp Act*, etc. that we will discuss a bit later in the course.

## Major effects on Britain

- Greatly aided the development of British shipping and shipping industry.
- Large profits for British Merchants.
- Spurs financial development to finance trade.
- Pays off in building a Navy: Shipping technology transferable to Royal Navy.
- Reduces dependence on foreign European markets.
  1. England goes from a net importer of tobacco and sugar to an exporter in just a few decades in the mid 17th century through re-export of colonial goods.
  2. Re-exports grow by 1.5% a year from 1700-1770, and exports and imports to and from colonies grow around 1.0% a year.

## Major effects on the colonies

- Increases shipping costs: shipping is more roundabout much of it having to pass through England, gives some monopoly power to British merchants, and places some restrictions on colonial enterprises.
- Thus, Navigation Acts raise prices of colonial goods and reduce colonial revenues.
- Navigation Acts act generally like a tax on colonial exports and imports with the distinction that revenue goes to English government, manufacturers, or merchants.
- We will model it as such, but will abstract from intertemporal considerations that could affect trade surpluses.
- Not very important abstraction: contrary to most historical accounts payment imbalances for the colonies as a whole do not appear to have been large, although a lot of regional variation.

## Cost to the colonies

- Many estimates are that the overall costs of the Acts were small, because there were offsetting benefits.
- Irwin estimates around 2% of colonial income.
- Benefits to colonies:
  1. Lower insurance rates on shipping: the Royal Navy effect. Irwin estimates offset about 1/3 of the costs.
  2. Access to a large market that had a high demand for many colonial products.
  3. Access to credit and relatively cheap British manufactures.
- The effects differ regionally.

## A specific factors model

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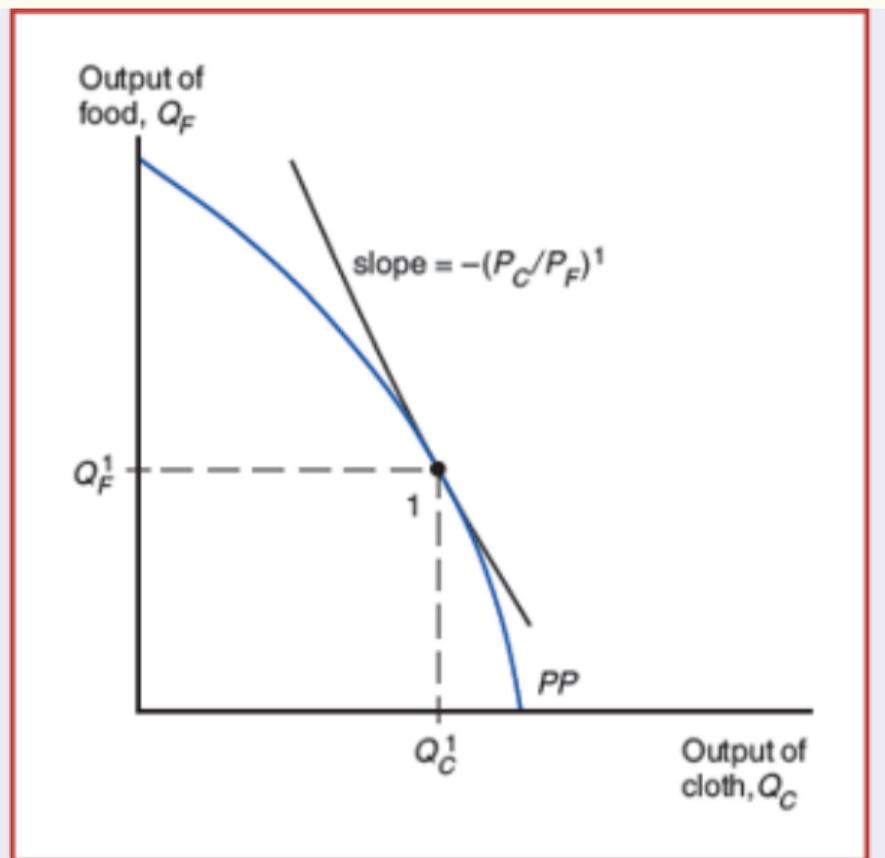
## Two goods

- Food and cloth are produced in Britain and the colonies.
- Production functions are the same in Britain and the colonies: easy to make Britain more productive, especially in cloth.
- Key distinction is relative factor endowments.
- Later, we will extend the analysis and look at the effects of externalities.
- Food and cloth stand in for agricultural commodities and manufacturing:
  1. Agricultural goods and raw materials were at least  $2/3$  of colonial exports and manufactured goods were  $2/3$  of imports.
  2. Top 3 exports: tobacco (27%), wheat and flour (19%), and rice (11%).
  3. 85% of colonial labor force employed in agriculture.
  4. Even today the U.S. is a net exporter of agricultural goods and an importer of clothing.

## Technology (Britain)

- Food uses a fixed supply of land along with labor:  $Q_F = T^\alpha L_F^{1-\alpha}$ .
- Cloth uses a fixed supply of capital and labor:  $Q_C = AK^b L_C^{1-b}$ .
- Labor is allocated across the two industries: a mobile factor.
- Labor market clearing:  $L = L_F + L_C$ .
- Define  $p = p_C/p_F$  as the relative price of cloth (equivalently: British terms of trade, the relative price of exports to the price of imports, or, the number of units of food to buy a unit of cloth).
- As the relative price of cloth becomes more expensive (slope of price line steeper), more cloth relative to food is produced. Relative supply of cloth is upward.

## Production possibility frontier (Britain)



## Demand (Britain)

- In particular, utility maximization:

$$\begin{aligned} & \max\{\ln(D_F) + \mu \ln(D_C)\} \\ \text{s.t. } & D_F + pD_C \leq w(L_F + L_C) + r_T T + r_K K_C \end{aligned}$$

- Thus, relative demands:

$$\frac{D_C}{D_F} = \frac{\mu}{p}$$

- Relative demand for cloth is downward sloping.

Relative price  
of cloth,  $P_C/P_F$

$(P_C/P_F)^1$

RS

1

RD

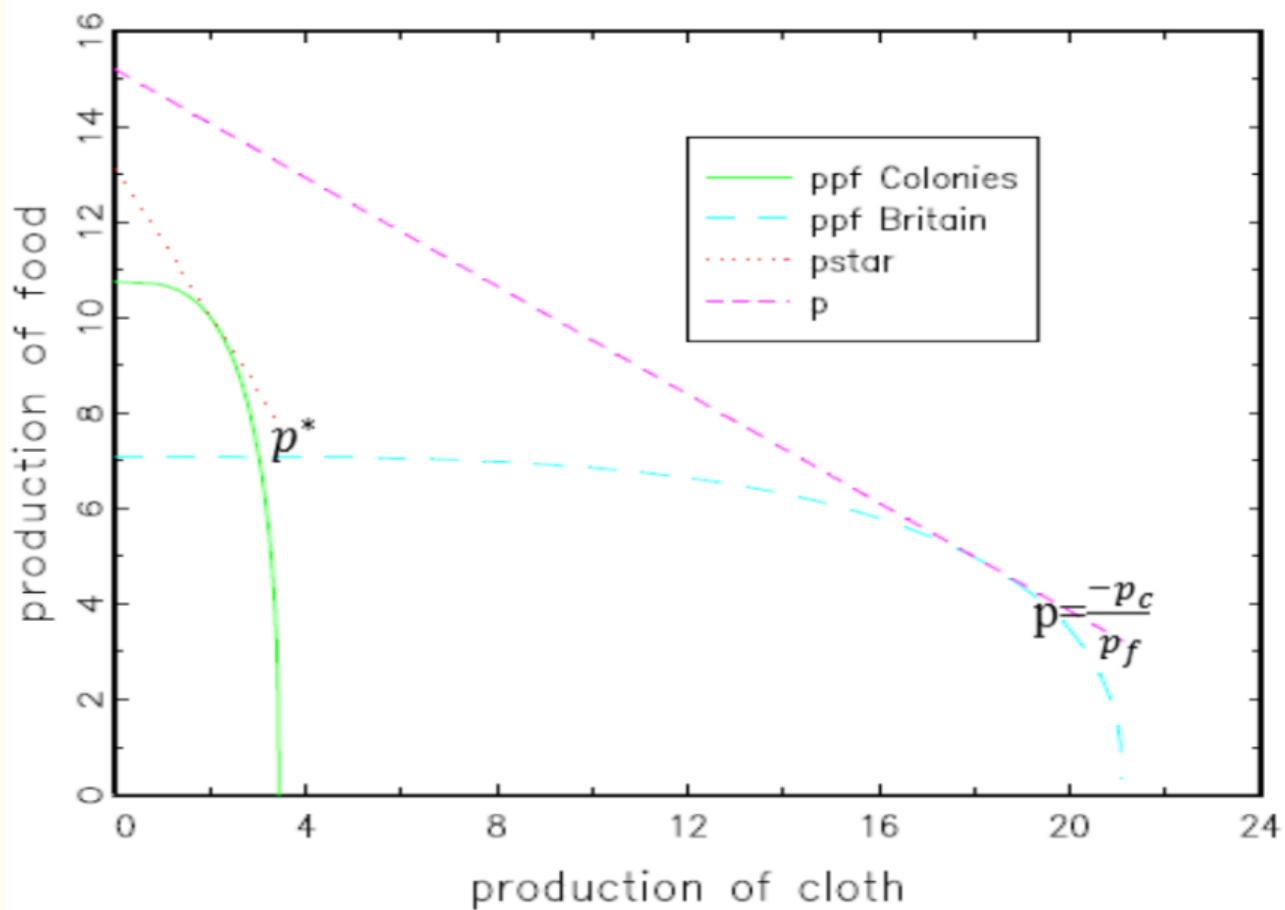
$(Q_C/Q_F)^1$

Relative quantity  
of cloth,  $Q_C/Q_F$

- Production in the colonies:
  - Food:  $Q_F^* = T^{*\alpha} L_F^{*1-\alpha}$ .
  - Cloth:  $Q_C^* = K^{*b} L_C^{*1-b}$ .
- Labor market clearing in the Colonies:
  - $L^* = L_F^* + L_C^*$ .
- Demand in the Colonies

$$\begin{aligned} & \max \{ \ln(D_F^*) + \mu \ln(D_C^*) \} \\ \text{s.t. } & D_F^* + pD_C^* \leq w^*(L_F^* + L_C^*) + r_T^* T + r_K^* K_C^* \end{aligned}$$

# Production Possibility Frontiers



# Aggregation

- Goods market clearing:

$$Q_F + Q_F^* = D_F + D_F^*$$

$$Q_C + Q_C^* = D_C + D_C^*$$

- Budget constraints: abstracting from taxes on cloth (each country consumes the same amount as it produces adjusted for import duties):

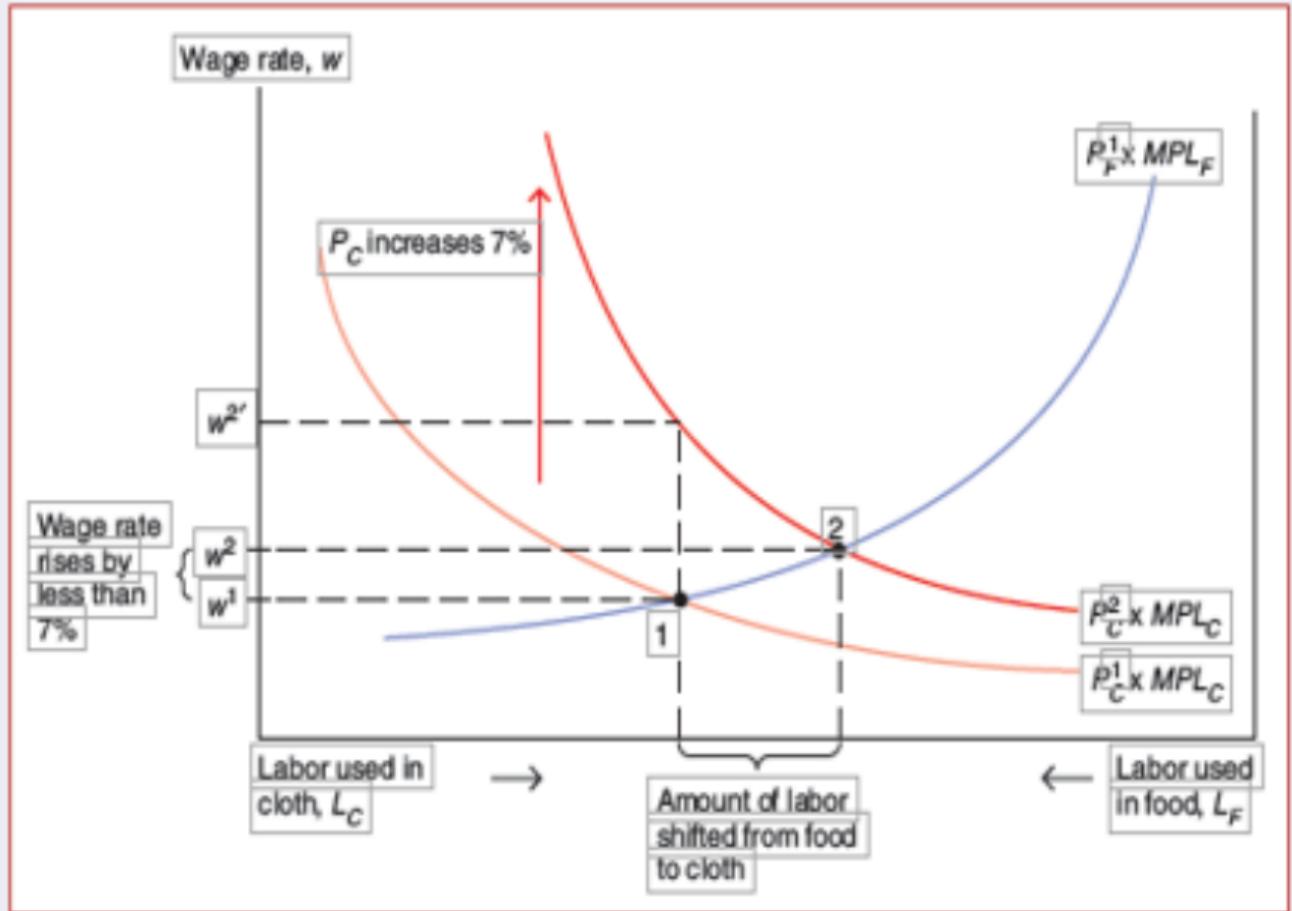
$$pQ_F + Q_C = pD_F + D_C$$

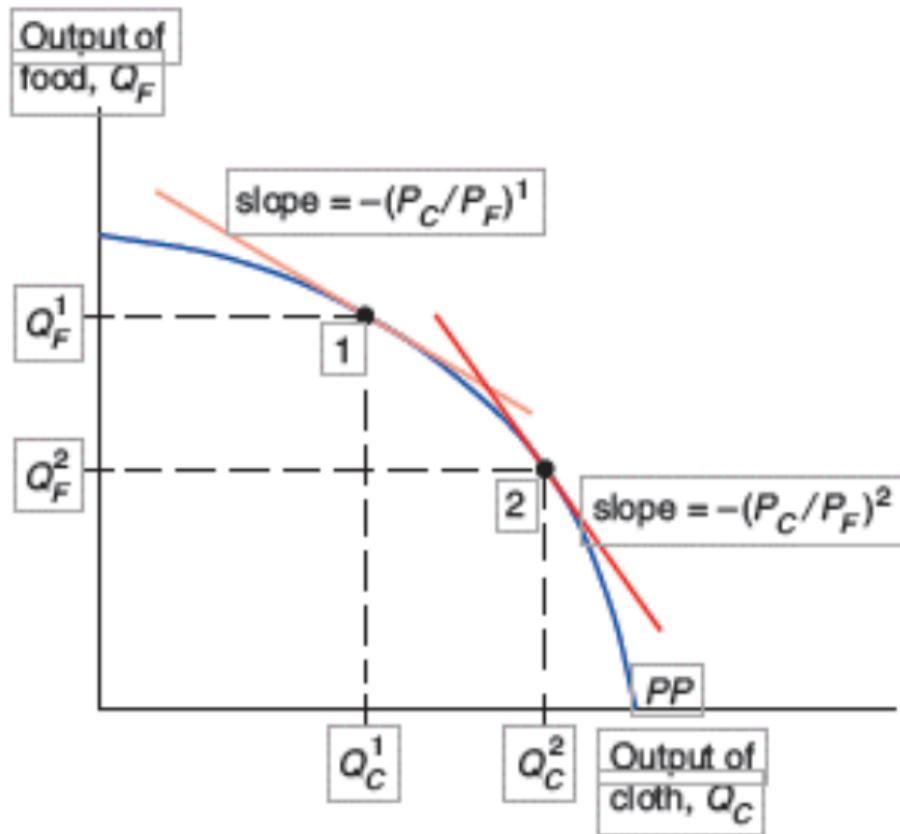
$$pQ_F^* + Q_C^* = pD_F^* + D_C$$

- Thus,  $Q_F^* - D_F^* = D_F - Q_F$ , i.e., colonial exports of food equal British imports of food.
- Major caveat: There will be no trade balance, which is motivating feature of mercantilism. We would need to discuss intertemporal aspects to get borrowing and lending into the analysis.

## Factor prices and relative price shifts

- Let us analyze the effect on an increase in the price of cloth in Britain.
- Wages rise by less than the price of cloth and labor moves into the production of cloth. Thus, the MPK increases and MPT declines. Capital owners are made better off at the expense of land owners. The opposite happens in the colonies.
- As more labor flows into cloth production, the relative supply of cloth  $Q_C/Q_F$  rises with the increase in  $P_C/P_F$ .
- Wages rise relative to the price of food, but decline relative to the price of cloth, so we do not yet know if workers will be better or worse off.

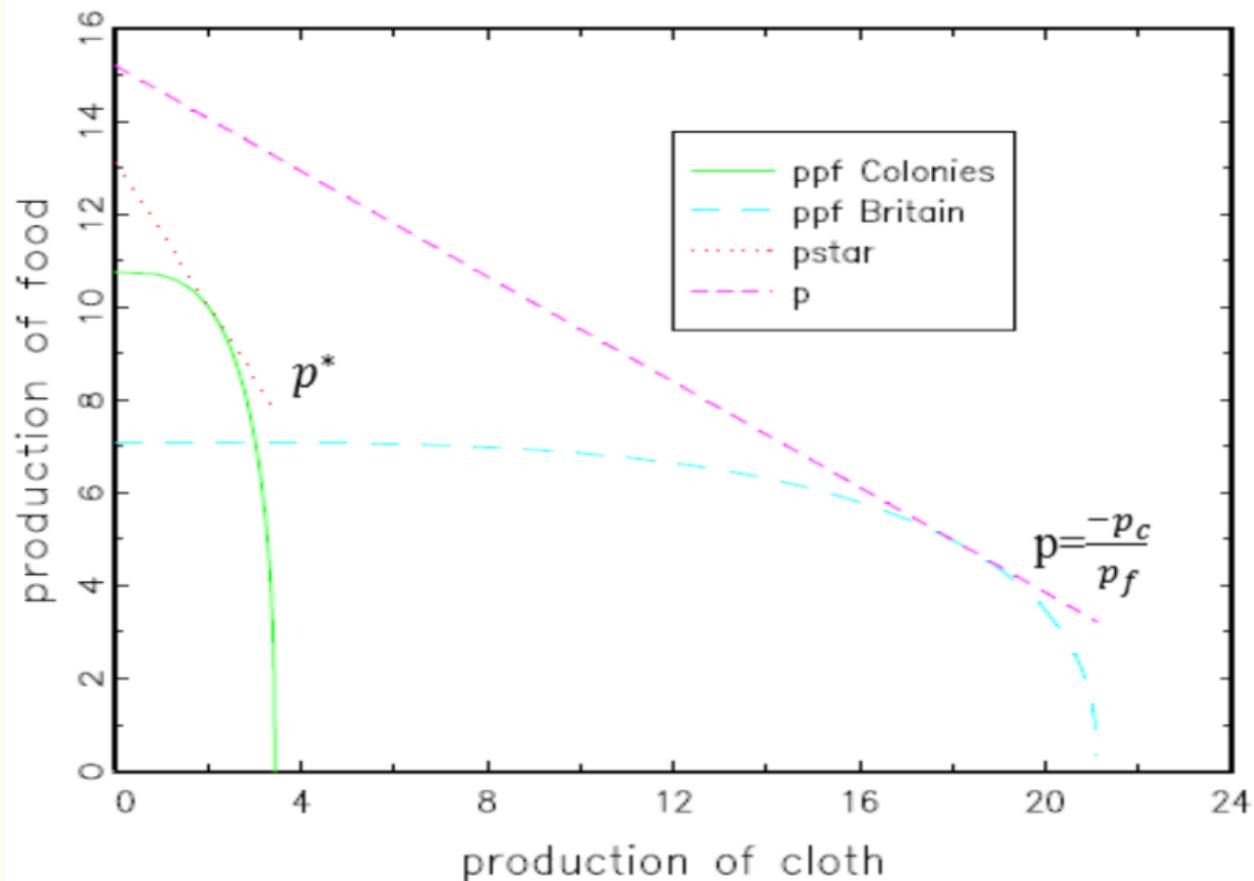




## Opening to trade

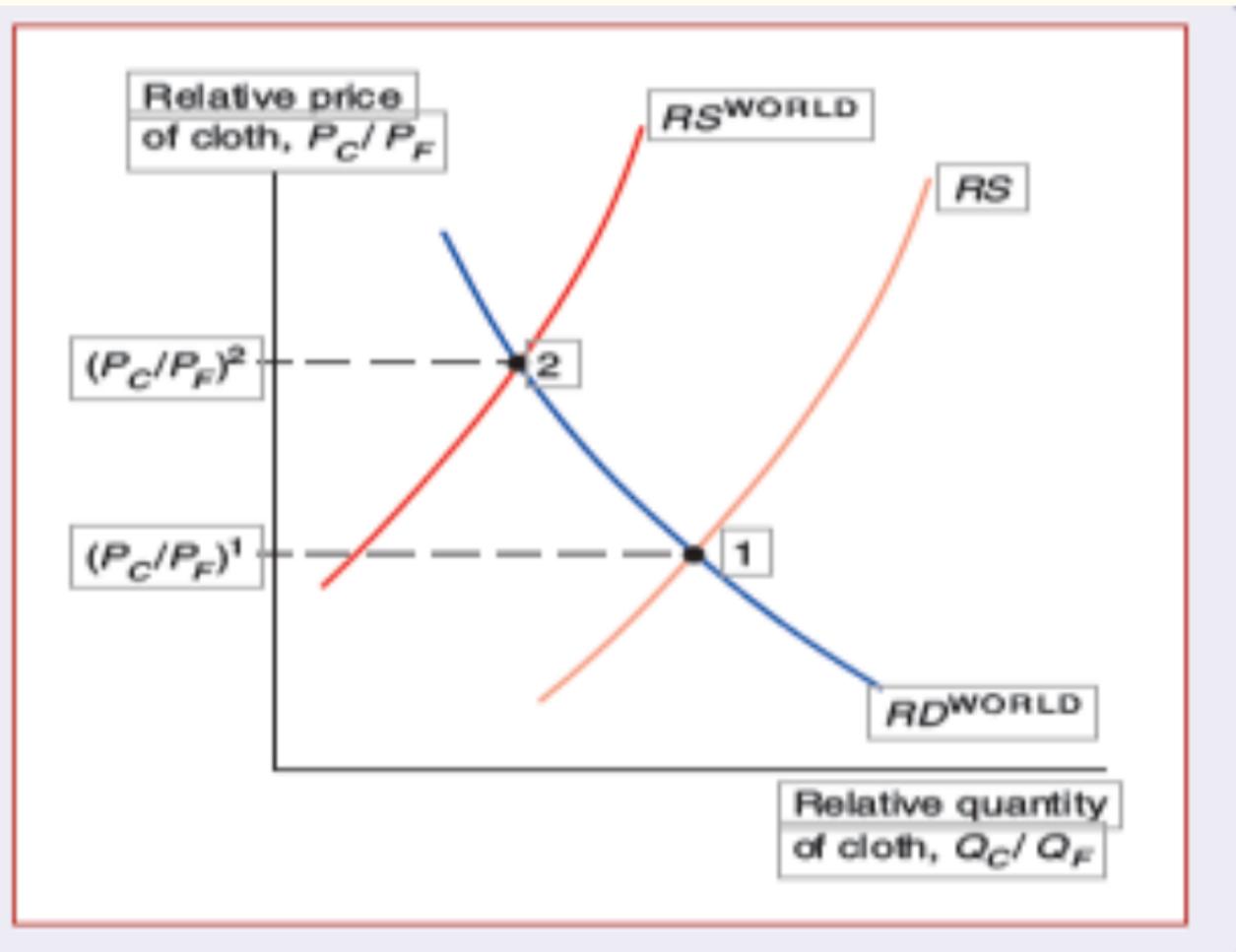
- In autarchy, the relatively land plentiful colonies produce relatively more food compared to Britain and at a lower relative price. In Britain, cloth is relatively cheap, as depicted by the flatter tangent.
- Now, we open the Empire to free trade.
- The equilibrium relative price will lie somewhere in between the two autarchic prices. As the relative price of food increases, the colonies produce more food (move from a point like 2 to a point like 1) along the PPF and Britain produces more cloth (a move from 1 to 2).

# Production Possibility Frontiers

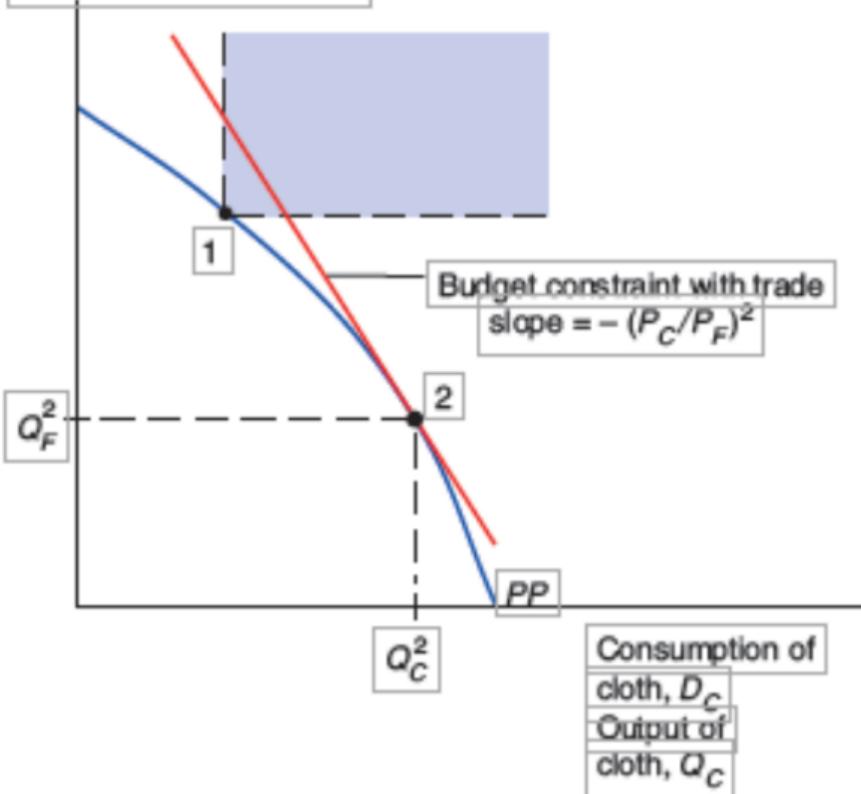


## The free trade equilibrium effect of trade

- The relative supply curve moves to the left (recall this is a relative supply curve for the world and for any given relative price the colonies produce a lower relative supply of cloth than does Britain).
- Thus the world relative supply lies to the left of Britain's relative supply.
  1. So far we now know that trade between Britain and the Colonies raise the relative price of cloth and lowers the relative quantity of cloth.
  2. British clothing manufactures do better and Colonial farmers do better.



Consumption of food,  $D_F$   
Output of food,  $Q_F$



## Consequences of trade

- Prior to trade, both British and the colonies consumed what they produced, but now they can consume anywhere along their budget line.
- The shaded area between the budget line and the PPF represents all the bundles Britain can now afford that represent an increase in the consumption of both goods relative to what was produced in the absence of trade.
  1. Potentially everyone is better off thanks to trade.
  2. But for that to happen there needs to be transfers between winners and losers.

# The effect of the Navigation Acts

- Navigation Acts grant some producers monopoly rights to sell to the colonies and most colonial exports and imports must go through British ports before being shipped to their final destinations.
- The result is similar to taxing colonial exports and imports. The colonists get less value for the goods they sell than they would with free trade and must pay more for the goods they import.

- New budget constraints:

$$pD_F + D_C \leq w(L_F + L_C) + r_T T + r_K K + t_F p(Q_F^* - D_F^*) + t_C(D_C^* - Q_C^*)$$

for Britain and

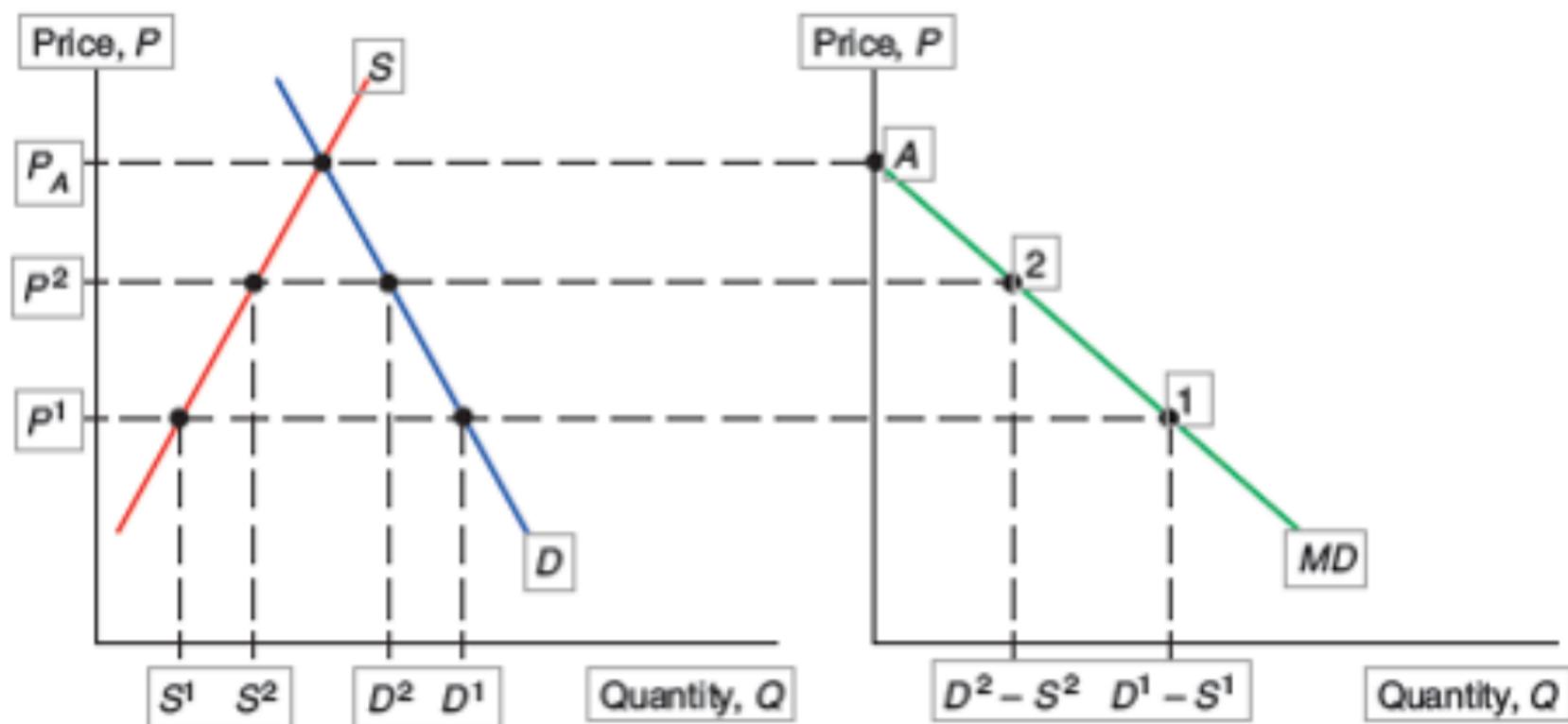
$$pD_F^* + D_C^* \leq w(L_F^* + L_C^*) + r_T^* T + r_K^* K - t_F p(Q_F^* - D_F^*) - t_C(D_C^* - Q_C^*)$$

for the colonies.

- The system could potentially make the colonies (or at least some colonists) worse off than under autarchy. And as the colonial economy becomes more sophisticated and able to produce goods similar to those produced in Britain, the degree of damage only increases.

## Effect of the tariff on the price of food

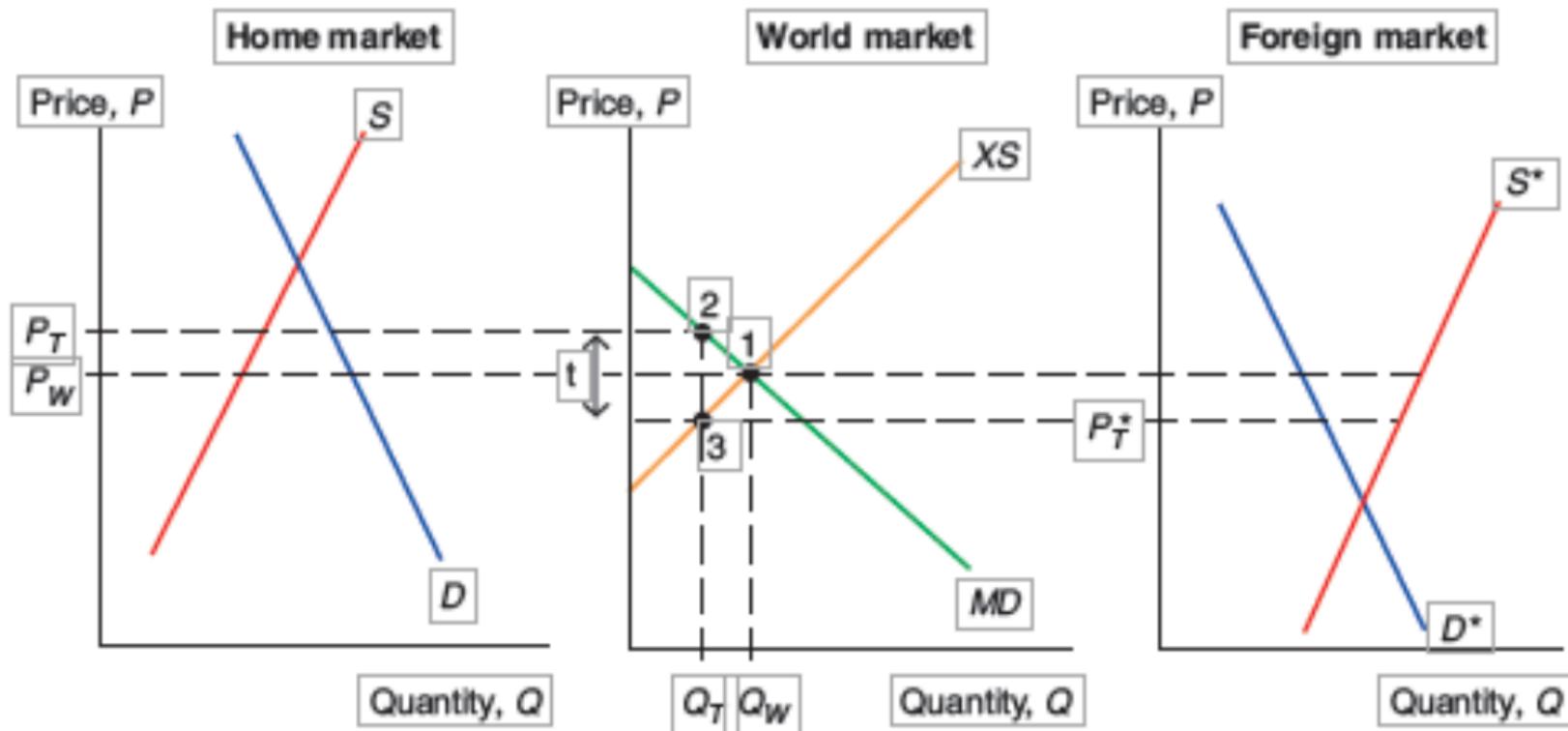
- Britain is the home country and the colonies are the foreign country. Analyze Britain's import demand for colonial food.
- Britain is relatively less efficient at producing food, so let's derive their import demand. Intersects at autarchy price  $P_A$ .
- As prices fall below the autarchic price, the demand for food exceeds its supply and imports are desired.
- Thus, the import demand curve intersects the vertical axis at  $P_A$ .



## Colonial export supply

- The colonies are relatively efficient at producing food and the price of food would be relatively inexpensive when compared with Britain.
- As prices rise above the autarchic price, the supply of food exceeds its demand and more exports are desired.
- Thus the export supply curve intersects the vertical axis at  $P_A^*$ .
- Due to the tariff, the price of food goes up in Britain, and Britain imports less food.
- The price of food declines in the colonies, because there is less British demand for food. Exports and imports decline until the difference in prices paid is equal to the tariff wedge.
- Assuming there is only mild spillover to the cloth industry, food is now relatively more expensive in Britain and relatively cheaper in the colonies.





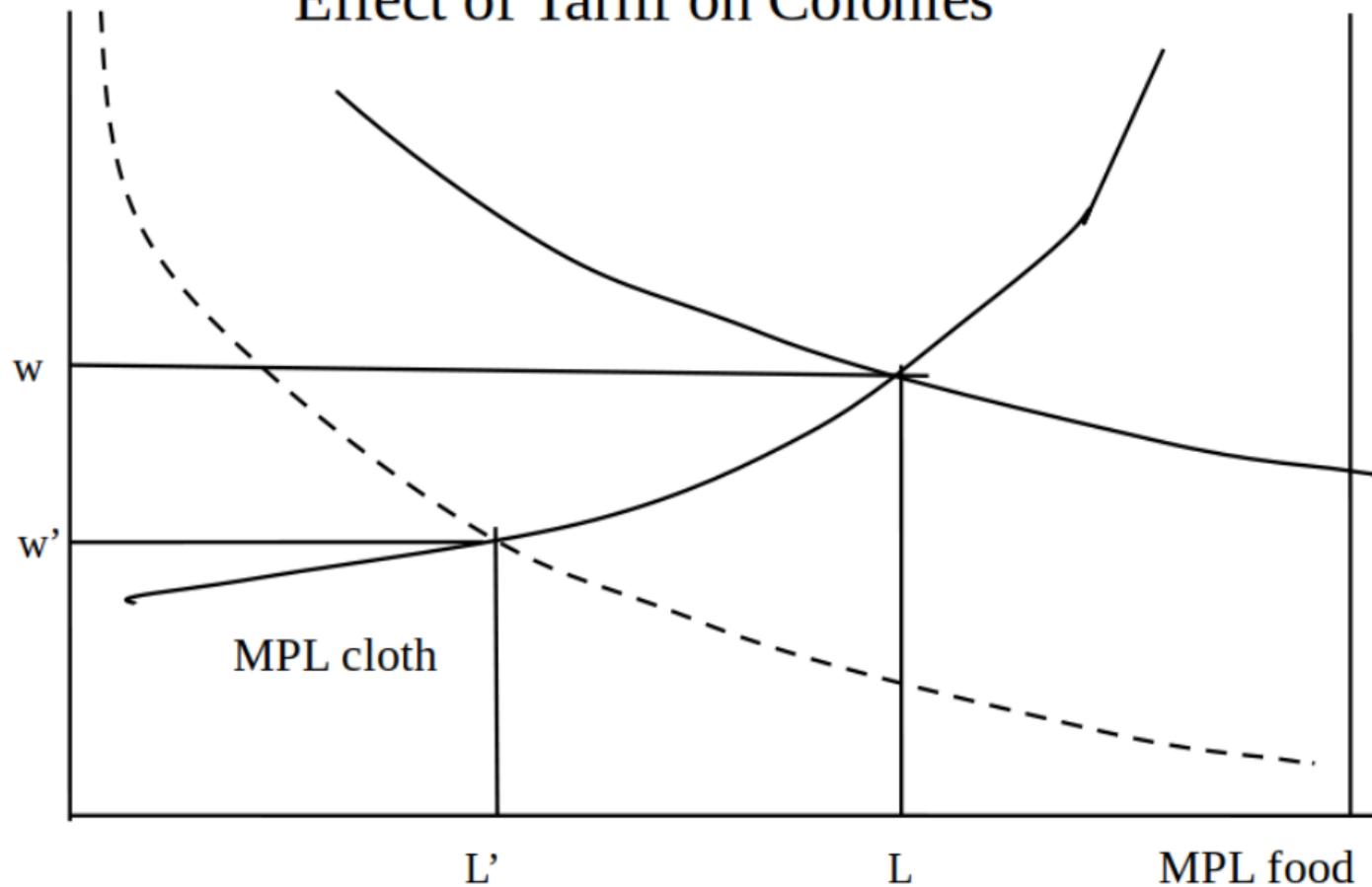
## Allocation of labor, I

- With the price of food rising in Britain, more workers shift into agriculture and less are utilized in cloth until the two marginal products are equated.
- The wage does not go up proportionally with the increased price induced by the tariff.
- The value of the marginal product of cloth curve is unchanged, assuming not a big effect on cloth prices.
- British land is now more valuable and its owners are better off at the expense of owners of capital.
- The effect on workers is ambiguous and the wage rises relative to the cost of clothing, which is relatively unchanged (goes up a bit), while it falls relative to the price of food.

## Allocation of labor, II

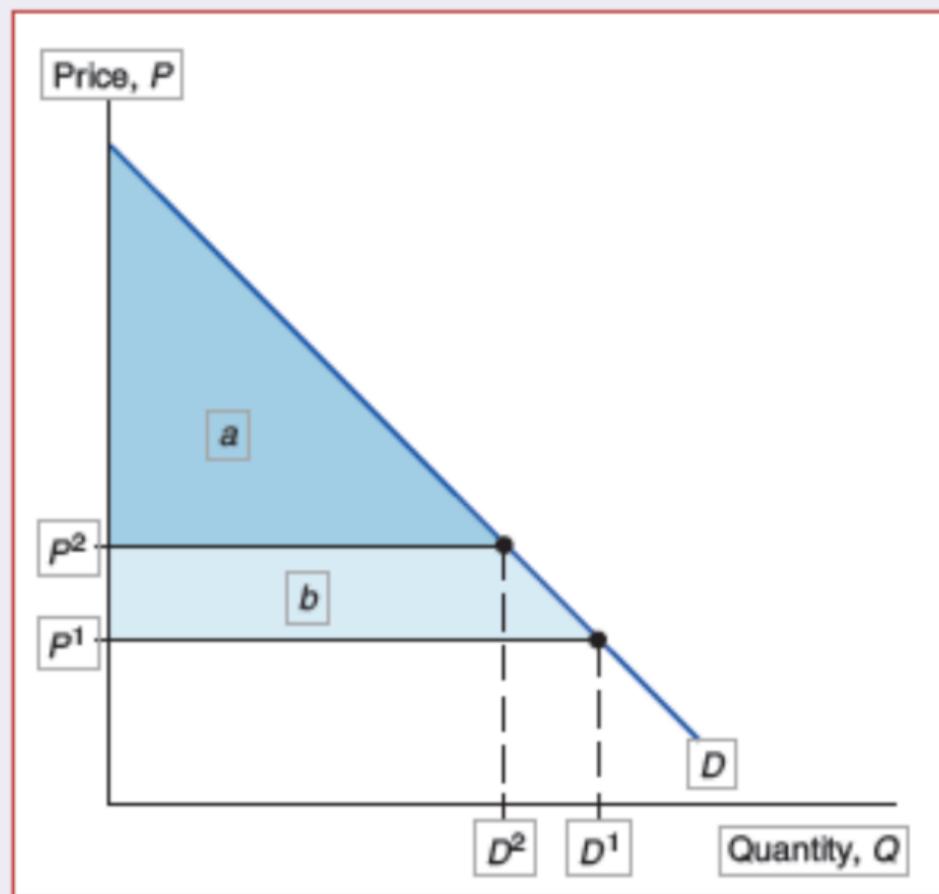
- In the colonies, food growers only get part of the revenue and the price of food is falling as well. The value of the marginal product of cloth curve is unchanged, assuming not a big effect on cloth prices.
- More workers shift into cloth production and less are utilized in farming until the two marginal products are equated. The wage does not fall proportionally with the increased price induced by the tariff.
- In the colonies, capital is now more productive and owners of land are worse off.
- The effect on workers is ambiguous and the wage rises relative to the cost of food, which has declined and falls relative to the price of cloth which is relatively unchanged.

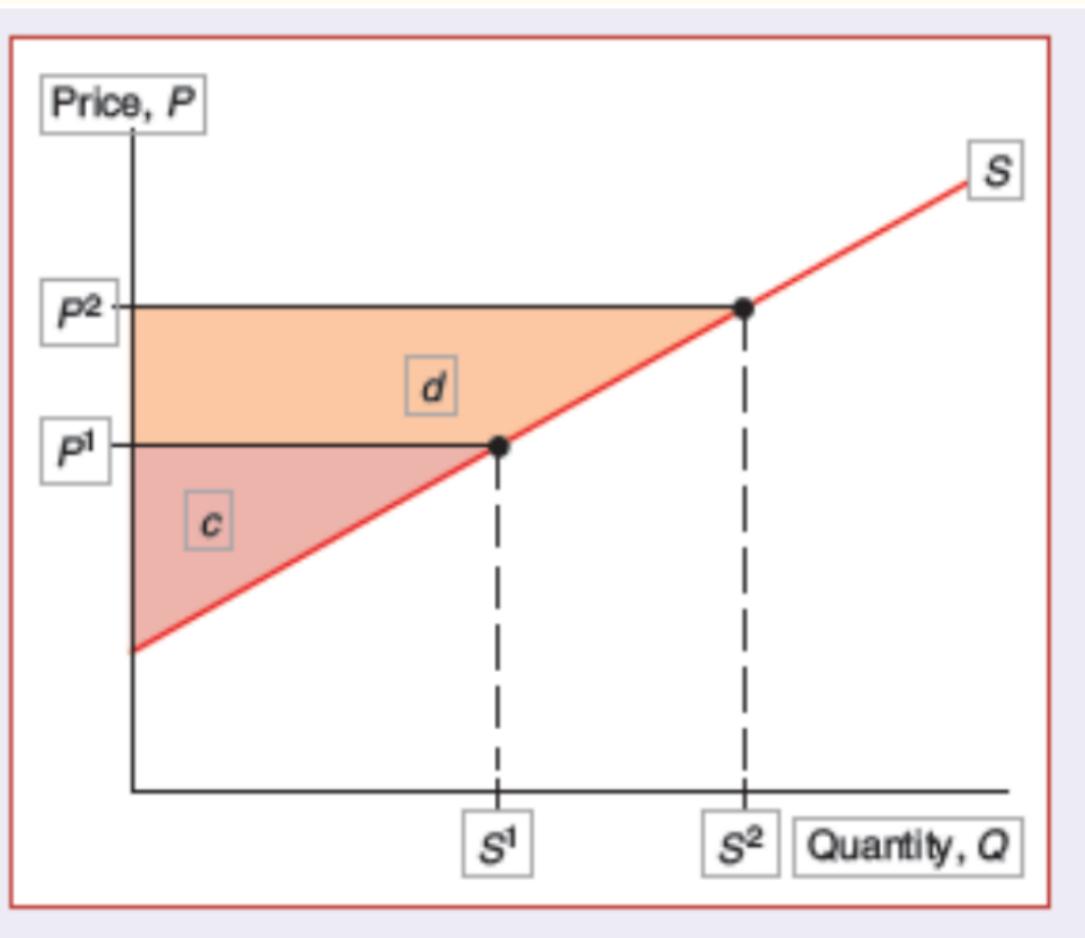
## Effect of Tariff on Colonies



## Some more on the winners and losers in the Colonies

- It is important that the Colonies are net importers of cloth and they do not receive any revenue from the tariff.
- With the price of cloth rising colonial producers gain by the  $a$ , while consumer surplus decreases by the area labeled  $a + b + c + d$ .
- On net, the colonies lose with respect to the cloth market.
- Also, the price of food declines and land owners lose out, and the loss grows bigger in size the more food the colonies export. Agricultural goods were a big export and the tax falls most heavily on enumerated goods, of which tobacco is the largest export.
- Rice less affected, because England is a small importer and the South was able to directly export to other European countries, especially southern Europe.
- Virginia planters grow increasingly disaffected, South Carolina plantation owners less concerned.



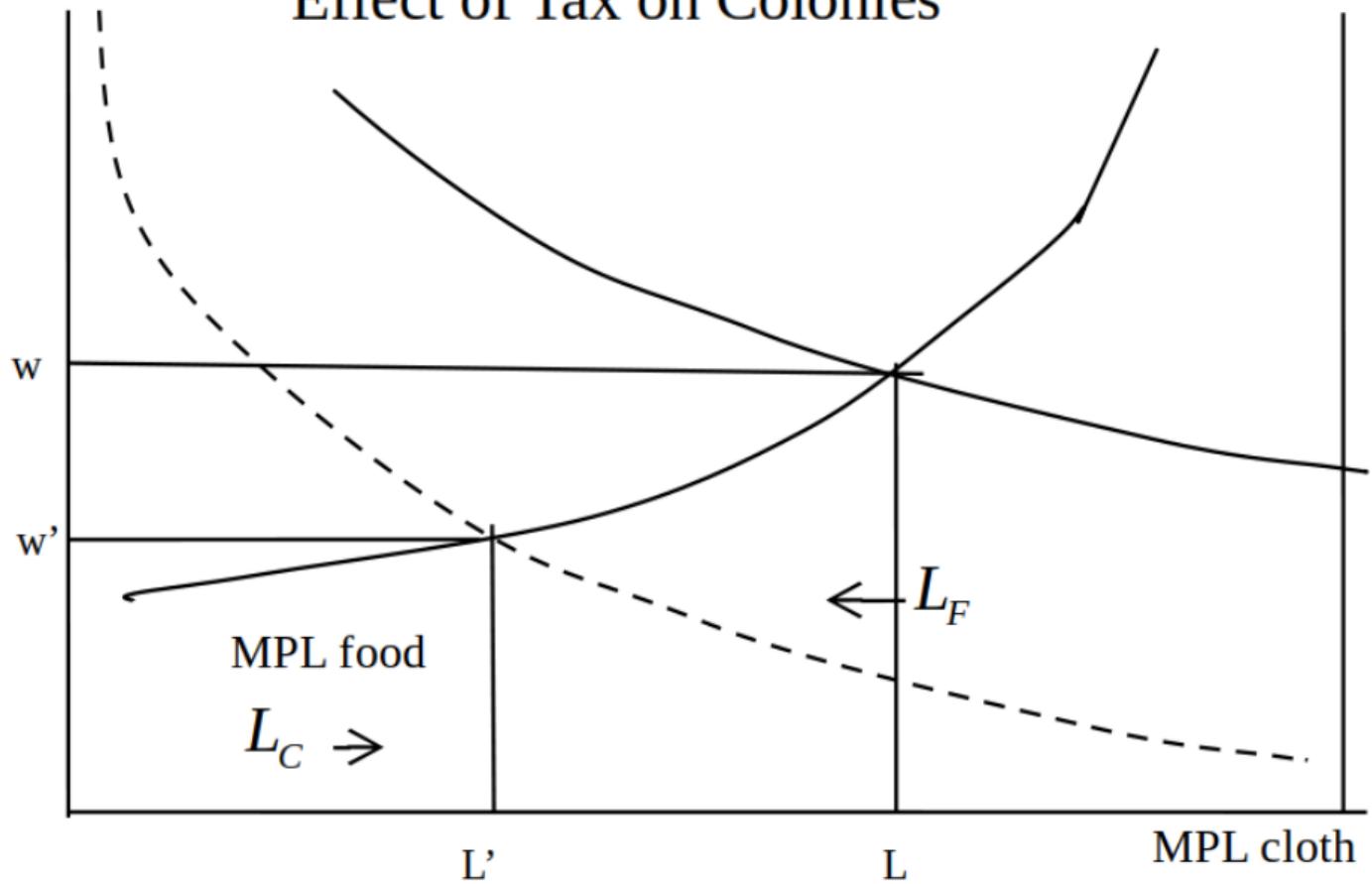




# Effects on manufacturing

- Very different stories depending on the good.
  - Some goods prohibited from being manufactured ( $\sim$  infinite tax).
  - Some manufacturers import intermediate products (tools, machines) from Britain at higher costs that would exceed those under free trade.
  - For example, rum producers must import more expensive sugar cane from the British West Indies.
  - So paying somewhat higher prices for some goods used in manufacturing, and in some cases for raw materials can be regarded as an appropriation of manufacturing profits.
- But some goods are in heavy demand by Britain: anything that involves ship building.
- Thus, some industries like lumber benefit a lot.
- Could it be the two policies together, end up with the same allocation of labor as with free trade, although with a lower wage and more distortions.

# Effect of Tax on Colonies



## Summing Up

- Mercantilist policies are designed to enrich Britain and extract resources from the colonies.
- Mercantilism reduces the supply of food from its free trade equilibrium amount and land owners are hurt.
- Capital owners benefit, but much of the benefit may essentially be taxed away by the Crown.
- There is some offset in gains from trading with a large market.
- Different goods affected differentially. Tobacco one of the most affected.
- Also, U.S. merchants face restrictions that prevent them from increasing their market share. Those merchants are concentrated in Boston, New York City, and Philadelphia.
- It is no accident that individuals who are merchants in Boston and those that are planters in Virginia lead the quest for independence.

## Trade and conflict

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- **Atlantic Trade and the Decline of Conflict in Europe** by R. Ahsan, L.Panza, and Y. Song.
- From 15th to 19th centuries, deaths due to conflict declines dramatically.
  - While 1 in 5 Europeans died in war in the 15th century, only 1 in 100 did in the 19th.
  - Some of this is due to imperial pursuits replacing conflict as the best way to achieve power and wealth.
- Paper proposes that rising trade with the Americas made a significant contribution to the decline.
- Uses pass through of wheat prices between 1640-1896 as a measure of market integration.
- In terms of our trade model, they are measuring where you are between autarchy and free trade.

- In theory, the impact of trade is ambiguous.
- War could raise trade costs deterring conflict. More so if trade is important.
- Increased wages in manufacturing could raise the cost of fielding an army and deter conflict.
- But Atlantic trade could substitute for trade among Europeans increasing the likelihood of war.
- Mercantilist doctrine could also increase conflict as Europeans strive for Atlantic dominance (Spanish Armada and Seven Years War).

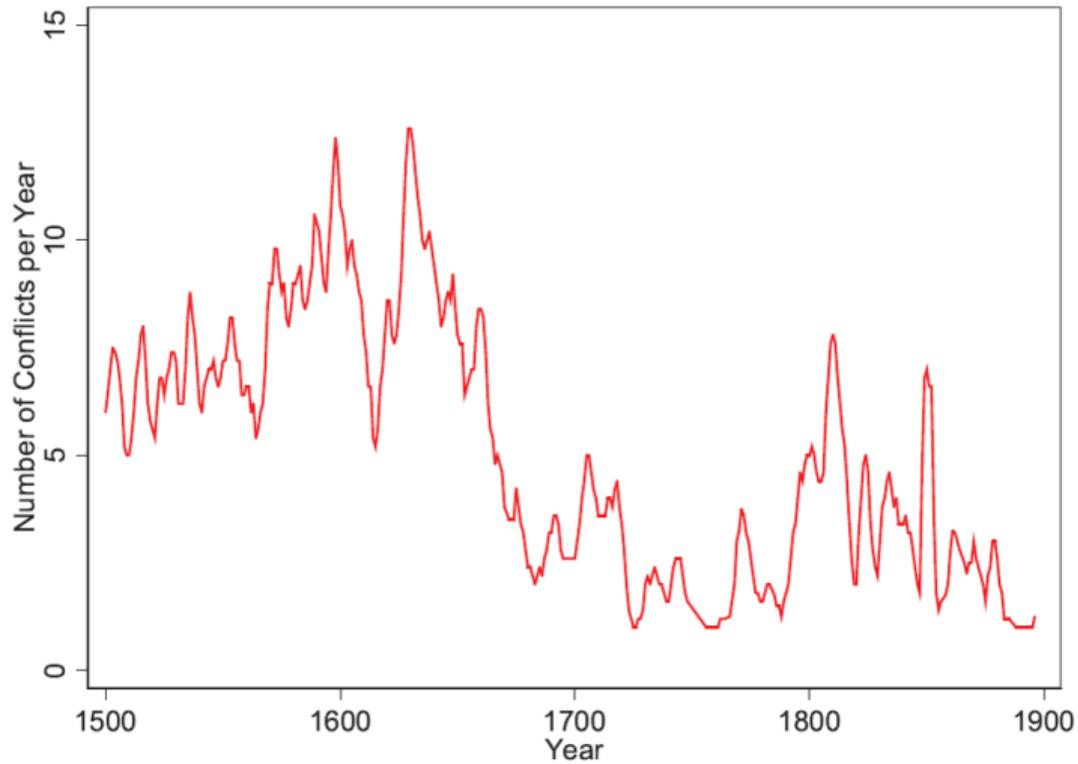
# Identification

- Econometric problem is pass could be correlated with exogenous factors that lead to war.
- We need IV that affects trade costs, but not events in Europe.
  - Exogenous cyclone activity in the Atlantic Ocean and interact it with wind-based sailing time between New World and each European country.
  - Shipping times are predicted from weather alone and are not affected by navigation expertise, shipping technology or other factors that could also affect conflict.
- Identifying assumption: Atlantic weather shocks only affect European conflict through trade.
  - A problem could arise if these shocks affect European agricultural income, which in turn could affect conflict.
  - Another problem is that weather could affect the likelihood of naval engagements.
- Additional instruments are European rainfall and the omission of naval wars.
- Find that trade reduced conflict by about 15% from a probability of around 2%.

- War involves the raising of an army, which is costly. It also produces returns to the winner.
  - One of those costs is the disruption of trade, in particular with the Americas.
  - A country with no links to the Americas is not constrained by the prospect of a trade interruption with the New World.
- We saw that what happens to wages when trade opens up is ambiguous. But empirically, at least over much of the period it appears to have raised wages in countries with trade connections.
- This raises the cost of conflict for the 5 European countries mentioned. Although, how much relative to the potential gains is probably small. (France and Britain are in a perpetual state of conflict in the 17th and early 18th century: 64 years out of 126 between 1689 and 1815).
- A countervailing force could be that Americas goods are substitutes for the goods trade within Europe.
- In that case, there is less cost to foregone bilateral trade within Europe the event of a war.

- The number of conflicts decline especially as we get to the second half of the 18th century.
- Wars also became less violent.
- All but one of the countries in the sample (Florence) engaged in hostilities at one time or another.
- The data provides variation in the onset of conflicts, the price of wheat and the pass-through of prices from the Americas, as well as independent variation in the cost of Atlantic shipping.

Figure 1: Number of Conflicts per Year.



# Estimation, I

- Estimating Pass through:

$$\Delta \ln P_{it} = \beta_{ij,t} \Delta \ln P_{jt} + \Delta e_{it}$$

- Idea: regress the price of wheat in  $i$  at  $t$  on price of wheat in  $j$  at  $t$  and regression coefficient measures pass-through.
- Note: pass-through is time varying.
- We saw that what happens to wages when trade opens up is ambiguous. But empirically, at least over much of the period it appears to have raised wages in countries with New World connections.
- Common weather conditions between countries could explain similar movements in price even if not integrated. Not a concern when one country is from the Americas.
- Integration could be due to other factors than trade. However, over a period where they have both trade volumes and pass-through the two are highly correlated.

## Estimation, II

- Estimating the relationship between trade integration with the Americas and the onset of conflict.

$$O_{ijt} = b_0 + b_1 C_{ij,t-2} + b_2 \beta_{ij,t-1} + b_3 \beta_{ij,t-1}^{Americas} + b_4 X_{ijt} + \text{country and date fixed effects}$$

where  $\beta_{ij,t-1}^{Americas} = .5(\beta_{i,t-1}^{Americas} + \beta_{j,t-1})$ .

- $O$  is an indicator variable for the onset of hostilities,  $C$  is an indicator for past conflict, and  $X$  is controls, including the logarithm of the distance between countries, language similarity measures, whether a border is shared, number of other wars the countries are involved in, and a five-year lag of population.
- To control for the potential endogeneity of  $\beta^{Americas}$ , we need an instrument correlated with New World trade and pass-through. Atlantic weather information: both Atlantic cyclones and wind patterns.
- It turns out that shipping costs and weather are positively correlated. And these may act somewhat like the tariffs we analyzed in reducing trade as they increase costs.

# Results

- The coefficient on bilateral trade is insignificant indicating that greater bilateral trade does not promote greater peace.
- The coefficient on Atlantic trade is negative and significant. The increase in Atlantic trade between 1655 and 1830 lowered the probability of conflict between 2 European countries by 0.30 ppt from a baseline probability of around 2 percent.
- Paper divides the sample into 50 year intervals and find that the results are stable across subperiods.
- Also, an extensive amount of robustness checks.
- War could increase trade costs with Americas and hence opportunity costs.

# Mechanisms

- Atlantic trade appears to have raised European wages and hence the cost of war:

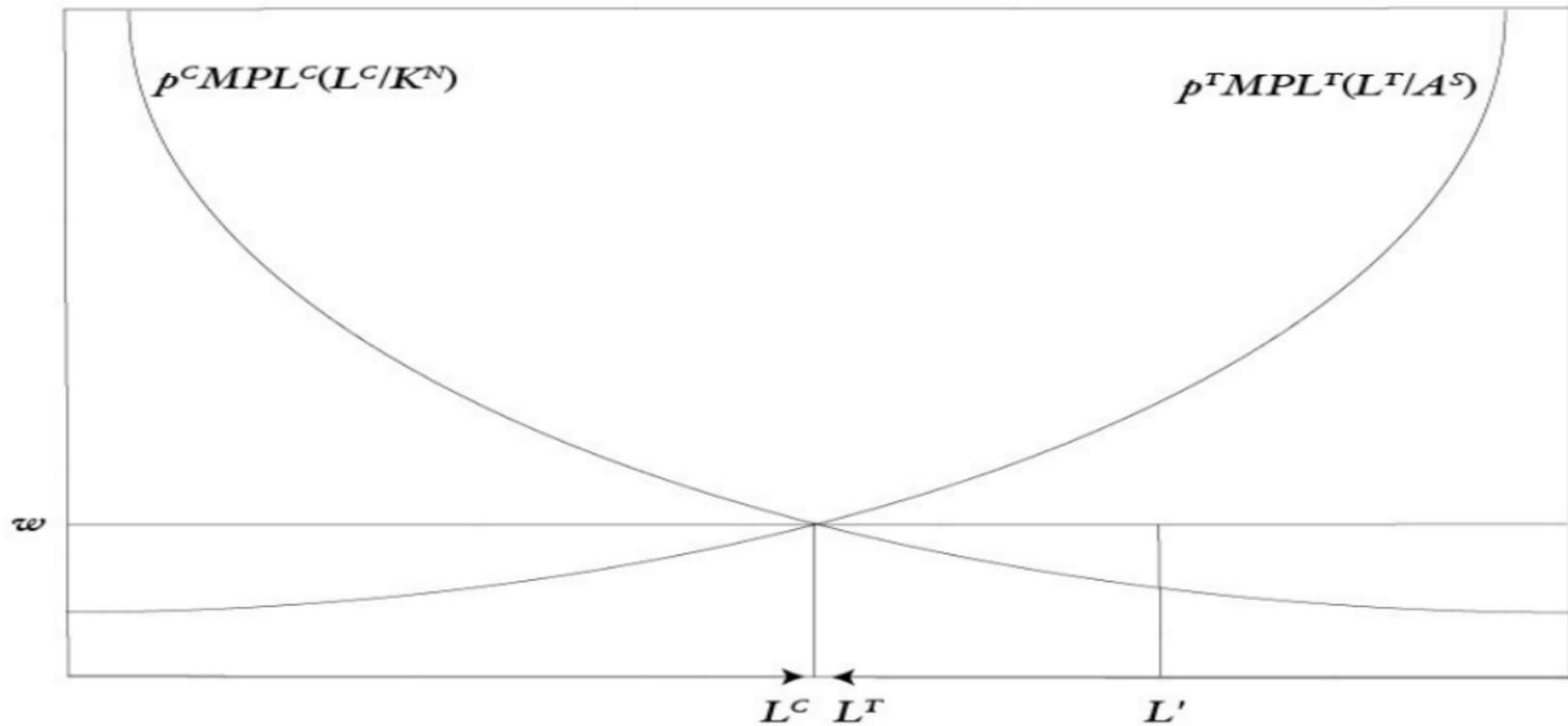
$$M_{it} = a_0 + a_1 \beta_{i,t-1}^{Americas} + \theta_i + t + v_{it}$$

where  $M$  is either the average real wage, number of soldiers per capita, or the log of naval ships.

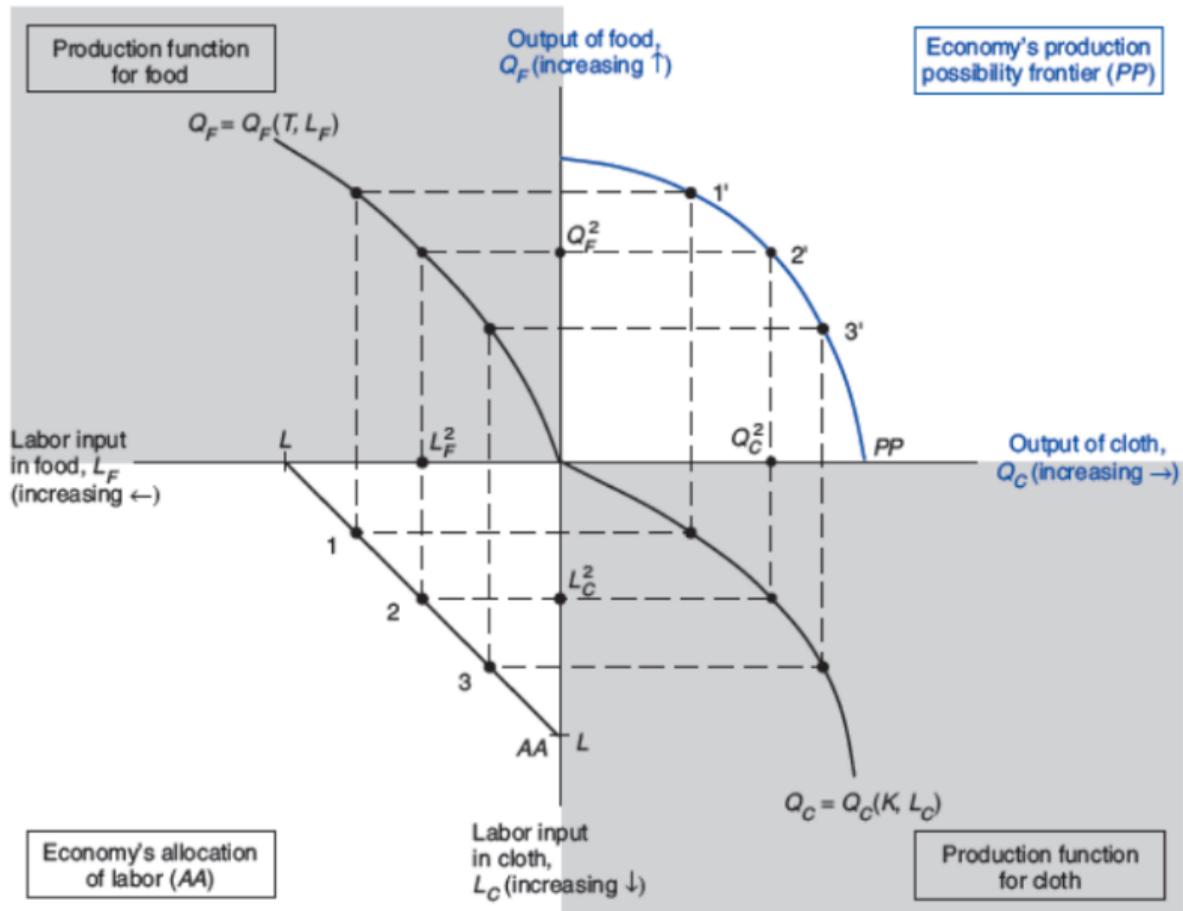
- Atlantic trade raises wages, and lowers both the size of the army and the navy:
  - Common weather conditions between countries could explain similar movements in price even if not integrated. Not a concern when one country is from the Americas.
  - Integration could be due to other factors than trade. However, over a period where they have trade volumes and pass-through the two are highly correlated.
  - The pacifying affects are strongest in those countries with most extensive trade (Britain, France, Netherlands, Portugal, and Spain).
  - Paper rules out the trade affects are spuriously coming from income shocks, institutional change, alliance formations via intermarriage.

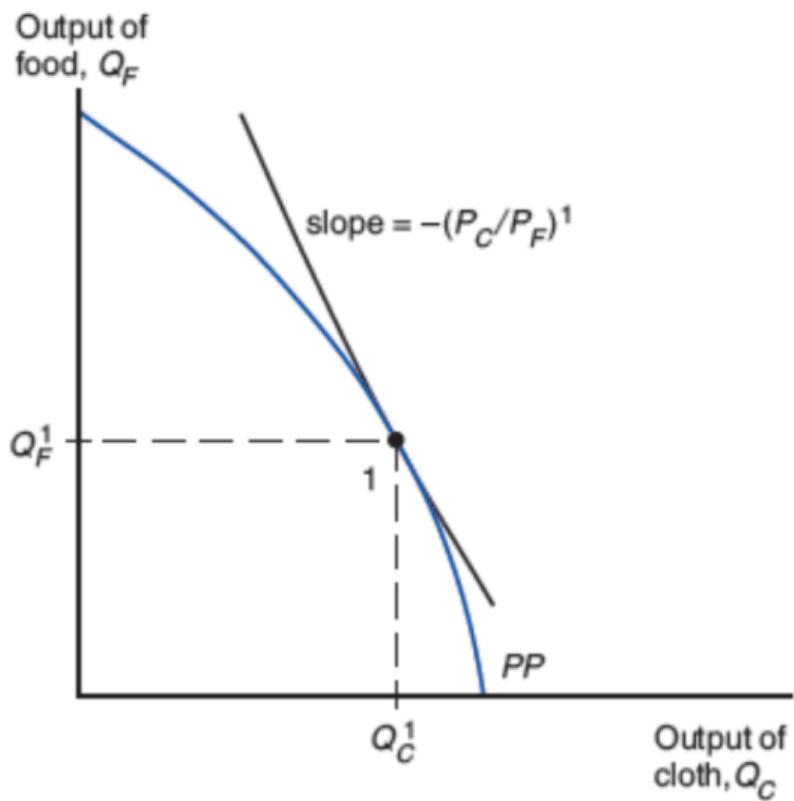
**Extra slides**

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Equilibrium with Specific Factors





$$\begin{aligned}pD_F + D_C &\leq w(L_F + L_C) + r_T T + r_K K + t_F p(Q_F^* - D_F^*) + t_C(D_C^* - Q_C^*) \\pD_F^* + D_C^* &\leq w^*(L_F^* + L_C^*) + r_T^* T + r_K^* K + t_F p(Q_F^* - D_F^*) + t_C(D_C^* - Q_C^*) \\pQ_F + Q_C + pt_F(Q_F^* - D_F^*) &= pD_F + D_C \\pQ_F^* + Q_C^* + pt_F(Q_F^* - D_F^*) &= pD_F^* + D_C^* \\p(1 + t_F)Q_F + Q_C + pt_F(Q_F^* - D_F^*) &= p(1 + t_F)D_F + D_C \\p(1 - t_F)Q_F^* + Q_C^* + pt_F(Q_F^* - D_F^*) &= p(1 - t_F)D_F^* + D_C^*\end{aligned}$$