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International Economics

III. Trade Theory: Smith and Ricardo

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III. Trade Theory: Smith and Ricardo

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Pugel, *International Economics*, pp. 32-66



1. Adam Smith and Absolute Advantage

Adam Smith (1723 – 1790)

- *Wealth of Nations* 1776
- Attacked mercantilism

Free Trade

- Free trade to Smith meant free trade both internally and externally – economic freedom
- Part of general advocacy for free markets: the “system of natural liberty”
- Peace, easy taxes, and a tolerable administration of justice



Adam Smith's Attack

- The *Wealth of Nations* was a sustained attack on mercantilism
- *Absolute advantage* was the basis of the superiority of trade over autarky:

It is the maxim of every prudent master of a family, never to attempt to make at home what it will cost... more to make than to buy. The tailor does not attempt to make his own shoes, but buys them from the shoemaker... What is prudence in the conduct of every private family, can scarce be folly in that of a great kingdom. If a foreign country can supply us with a commodity cheaper than we ourselves can make it, better buy it of them with some part of the product of our own industry, employed in a way in which we have some advantage.



The determinant of International Trade

- Individualism: Smith compared nations to households
- Trade is beneficial to individuals, the same is true of nations

A few abstractions to simplify

- Only two countries
- Only two goods
- Only labour input considered; labour hours constitute the price
- Simplifications, but more goods would not change the outcome

Remember: relative prices the key



Absolute Advantage: Numerical Example

Absolute advantages: The foreign country (home country) has an absolute advantage in producing food (clothing)

	Foreign Country		Home Country
1 unit of food	2 hours	<	2.5 hours
1 unit of clothing	4 hours	>	1 hour

Relative commodity prices in autarky

- Individuals trade equal labour values of food for clothing
- For example the price of 1 unit of clothing in the home country is 0.4 units of food, that is 1 hour/2.5 hours

	Foreign Country	Home Country
price of 1 unit of food	0.5 units of clothing	2.5 units of clothing
price of 1 unit of clothing	2 units of food	0.4 units of food



Absolute Advantage: Numerical Example

Opening to Trade

- both countries **completely focus on their absolute advantages**
- The foreign country's labour shifts towards producing food, which has a higher value when exported abroad
- The foreign country imports clothing, which is cheaper abroad

Specialization and Prices

- Both countries specialize in their absolute advantage
- The international prices must be somewhere in the range
 - $0.5 \leq \text{clothing price of 1 unit of food} \leq 2.5$ and
 - $2 \geq \text{food price of 1 unit of clothing} \geq 0.4$

Both countries gain by trade and specialization

- The other commodity can be imported at a lower price than before trade
- Both countries gain as both have more goods available



Absolute Advantage: Summary

- A country will produce and export those goods in which it has an *absolute advantage*
- It will import those goods in which it has an *absolute disadvantage*
- There is a clear gain from trade, as productivity increases and prices fall
- This is in reality a special case of the principle of comparative advantage!



2. The Principle of Comparative Advantage

Absolute versus comparative advantage

- The theory of absolute advantage showed that countries gain by free trade if each country has an absolute advantage
- David Ricardo demonstrated in the early 19th century that trade is beneficial whether or not countries have any absolute advantage



Comparative Advantage and Gains from Trade

Ricardo's Argument

- The same assumptions as the theory of absolute advantage
- But this only a simplification
- Labour the only input

Gains From Trade

- By exporting goods in which it has **its greatest comparative (relative) advantage in productivity**
- And importing those in which it has a comparative disadvantage
- Even if one nation has an absolute advantage at producing everything, both countries gain by trading with each other



Ricardo's Example

Formulated the theory 1817, *Principles of Political Economy*

- Two countries: Portugal and England
- Two goods: cloth and wine
- Portugal has an absolute advantage in both

Hours of labour necessary to produce one unit		
	Cloth	Wine
England	100	120
Portugal	90	80



Before Trade

- England needs 220 hours of work to produce 1 unit of each good
- Portugal only needs 170 hours of work for the same result

Comparative Advantage

- England has an advantage in cloth
 - The wine price of cloth is $5/6$ versus $9/8$ for Portugal
- Portugal has an advantage in wine
 - The cloth price of wine is $8/9$ versus 1.2 for England
- Thus, trade is clearly beneficial



Opening Trade

- Portugal will specialize in wine, import cloth
- England will specialize in cloth, import wine

Greater Productivity

- Portugal will spend 170 hours of work to produce 2.125 units of wine
- England will spend 220 hours of work to produce 2.2 units of cloths

Prices

- Wine price of cloth: between $\frac{5}{6}$ and $\frac{9}{8}$
- Cloth price of wine: between $\frac{8}{9}$ and $\frac{6}{5}$



Recall: the higher productivity under division of labour

Recall the example of two persons from the introductory lecture

- Person A is more productive than B in the production of both p and q . For the production of one unit of p A needs 3 hours compared to B 's 5 and for q 2 hours compared to B 's 4
- If each produce p for 60 hours and q for 60 hours, the total output is $32 p + 45 q$
- If A concentrates on production of q and B on production of p , the total result is $24 p + 60 q$
- Can we say that this is a preferable outcome?



Recall: the higher productivity under division of labour

- Yes we can! For A , p has a substitution ratio of $3/2 q$ and for B a substitution ratio of $5/4 q$, which means that $24 p + 60 q$ signifies a higher output than $32 p + 45 q$
- For A , the total product under autarky is therefore equal to $93 q$, and for B it is equal to $85 q$
- Under division of labour, for A the total product is equal to $96 q$, and for B it is equal to $90 q$
- Another way of seeing it: A can devote just enough of his time to produce $8 p$, so the total product is $32 p$, and spend the rest of his time producing q , which will yield $48 q$
- How much time will be spent by A in production of p depends on the value to him of that good



The Benefits of Cooperation

It is simply that, when one man says to another, ‘you do only this and I will do only that, and we’ll share,’ there is better employment of labor, talents, natural resources, capital, and, consequently, there is more to share. So much the better if three, ten, a hundred, a thousand, a million men join the association.

- Frédéric Bastiat



Comparative Advantage: Numerical Example

Example: The U.S and the RotW

- The RotW has an absolute advantage in both food and clothing

	United States		Rest of the world
1 unit of food	2 hours	>	1.5 hours
1 unit of clothing	4 hours	>	1 hour

Commodity prices in autarky

- The price of 1 unit of clothing in the RotW equals 0.67 units of food, that is 1 hour / 1.5 hours

	United States		Rest of the world
price of 1 unit of food	0.5 units of clothing		1.5 units of clothing
price of 1 unit of clothing	2 units of food		0.67 units of food



Comparative Advantage: Numerical Example

Price adjustment

- Opening up to trade will cause a fall in price and a rise in production
- The equilibrium international price ratio will settle between these ratios:
 - $0.5 \leq \text{international price of food} \leq 1.5$ units of cloth
 - $2 \geq \text{international price of clothing} \geq 0.67$ units of food

Specialization

- The RotW (U.S.) specializes in the production of its comparative advantage on clothing (food) and imports the other commodity at a lower price than in autarky
- Both countries gain by trading with each other and specializing even in the absence of an absolute advantage in the foreign country



The *production possibility curve*

- The ppc shows all combinations of amounts of the two goods each country can produce
- With no trade, each nation's choice for consumption of food or clothing is limited to a point along its ppc

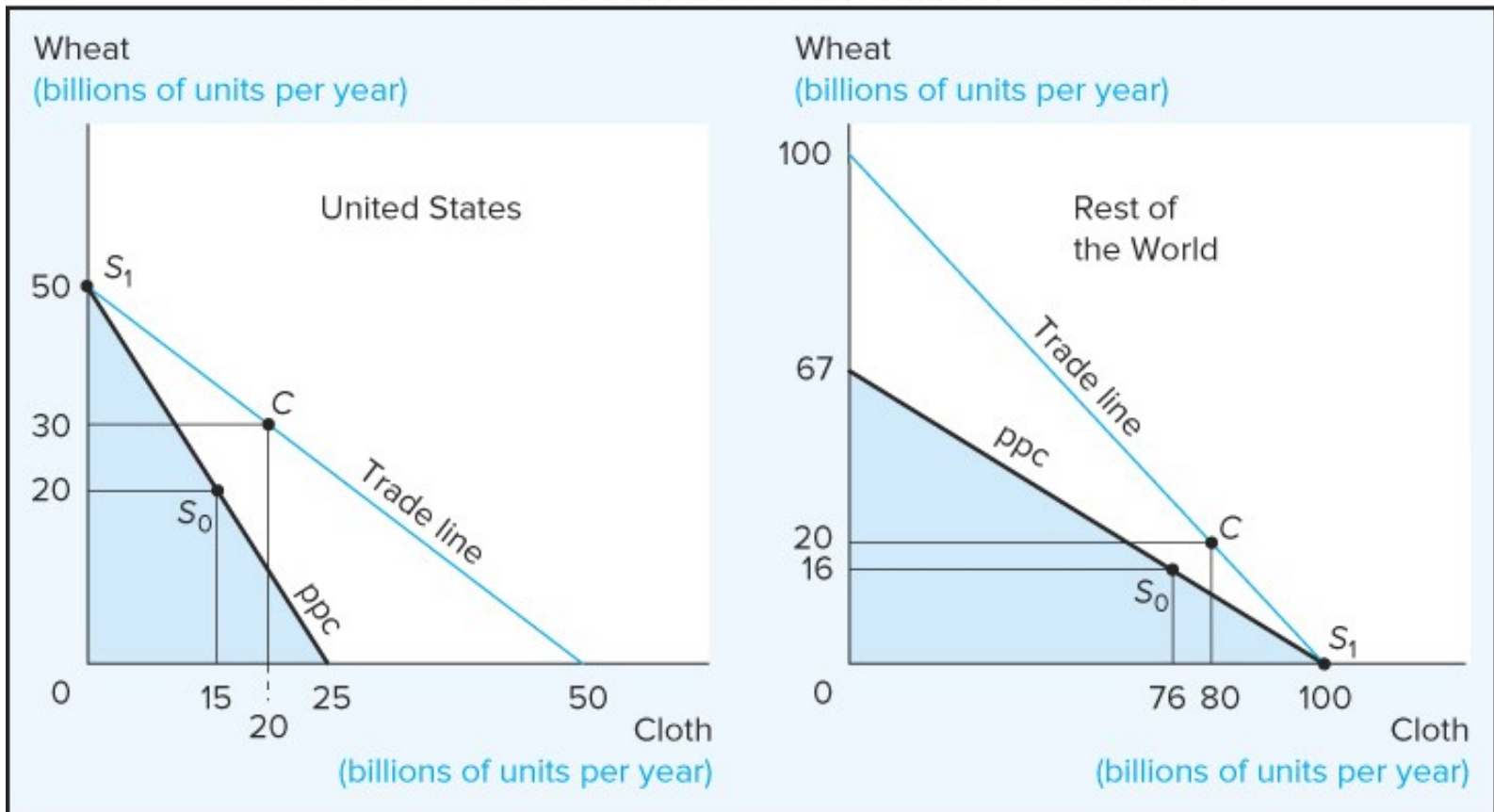
Beyond the ppc

- When trade opens up, each country specializes in producing its comparative-advantage product (point S_1 on the ppc)
- Under free trade, consumers in each country can consume at any point along the new trade line (point C, for example)



Graphical Solution

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The Trade Line

- The line reflects the price of goods
- Here the price of cloth is conveniently assumed to be 1 W/C
- However, it is a bit of a simplification: the price will naturally change depending on supply and demand
 - The more cloth is supplied, the lower the price
 - The less cloth is supplied, the higher the price
- Similarly, the more cloth is demanded (in exchange for wheat), the higher the price, and the less is demanded, the lower the price

Determinate Price Range

- The price of cloth will settle somewhere between 0.67 and 2 units of food (wheat)
- Always between the “autistic” prices



Empirical Tests of the Ricardian Setting

Are developing countries gaining from trade?

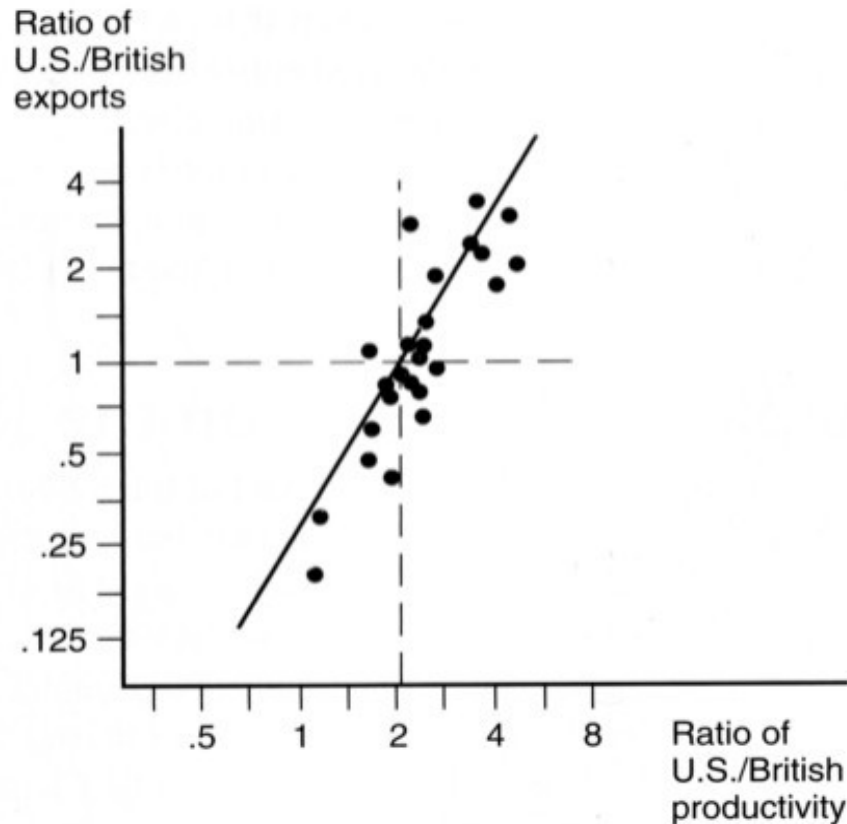
- The Ricardian trade model suggests that developing countries with generally low productivity also gain from trade

Empirical tests

- Tests from post-WWII compared UK with US productivity
- US industries had much higher labour productivity than British ones
- Balassa (1963) showed that the US exceeded the British in all 26 sectors he examined
- In 12 sectors Britain nevertheless had larger exports than the US
- US exports were larger than UK exports only in industries where the US productivity advantage was more than double



Empirical Tests of the Ricardian Setting



- Every dot represents a different industry
- All points have a value higher than 1 on the horizontal axis. This indicates that labour productivity is higher in the US than in the UK in all industries
- Twelve dots have a value lower than 1 on the vertical axis. In these industries the UK nevertheless has larger exports



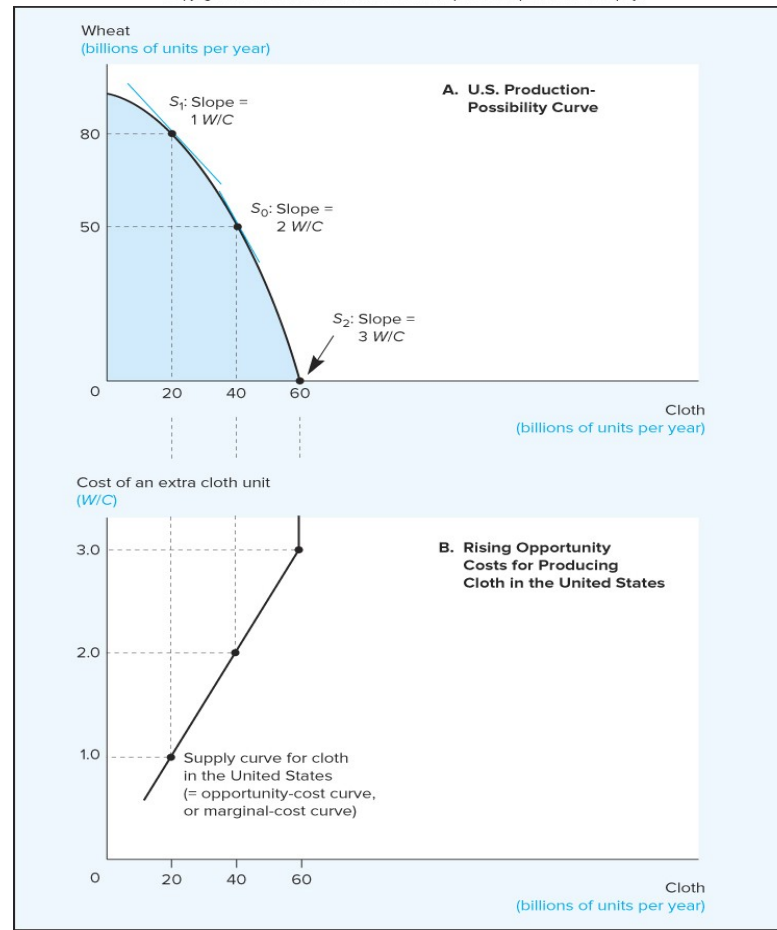
3. Comparative Advantage under Increasing Costs

- The Ricardian theory was elaborated under an assumption of constant costs. Does it change if we introduce a more realistic assumption of *increasing marginal costs*?
- Increasing marginal costs: as one industry expands at the expense of others, increasing amounts of other products must be given up for each additional unit of product
- As a result, the ppc will not be a straight line but declining



PPC under Increasing Costs

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The ppc

- In the absence of trade, each country will choose somewhere along the ppc
- This choice between production possibilities is determined by what leads to highest consumer satisfaction
- The slope of the ppc = the autarkic price

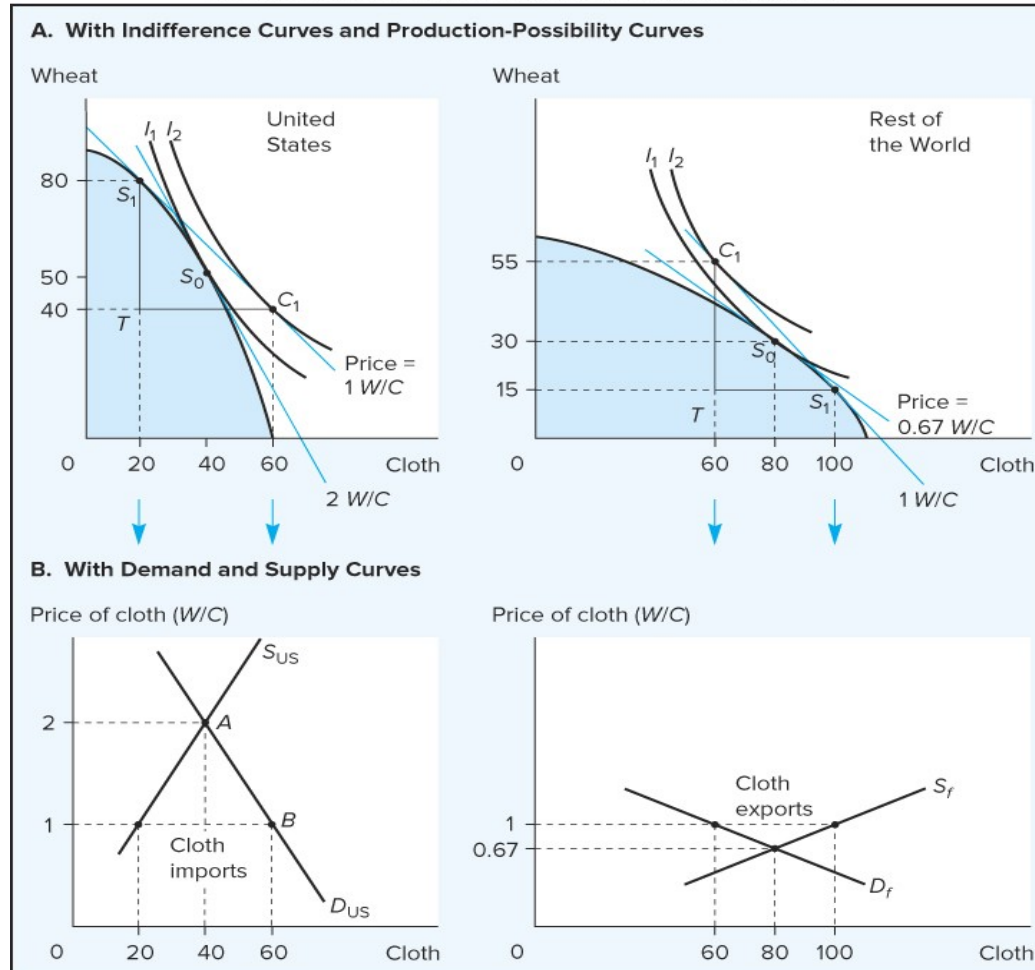
Increasing Costs

- Increasing costs: price rises as production of one good increases
- Under free trade, each country moves along the ppc to increase production of the good in which they have a comparative advantage
- Ppc and demand and supply curves show the gains from trade



International Trade

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The Gains from Trade

- Each country is able to consume at a point that lies beyond its ppc, reflecting the greater productivity under international division of labour
- The gains from trade for each country depends on its terms of trade: the relative price of its exports in terms of its imports
- International trade affects production, as each country specializes
- And it affects consumption, as the price of imported goods decline, resulting in higher consumption of these (substitution effect)
- It also increases real incomes, so consumers tend to buy more of each product (income effect)



4. The Heckscher-Ohlin Theory

- This is a modern development of the Ricardian theory
- Introduced by two Swedish economists: Eli Heckscher and Bertil Ohlin, in the first part of the 20th century
- Heckscher was a famous economic historian, Ohlin economist and politician and later Nobel laureate



Factor Abundance and Trade

- A country exports the product that uses its relative abundant factor(s) intensively
- It imports the product that uses its relatively scarce factor(s) intensively

Abundance and Intensity

- A country is relatively labour-abundant if it has a higher ratio of labour to other factors than does the rest of the world
- A product is relatively labour-intensive if labour costs are a greater share of its value than they are of the value of other products



Ohlin's Formulation of the Theory

Commodities requiring for their production much of [abundant factors of production] and little of [scarce factors] are exported in exchange for goods that call for factors in the opposite proportions. Thus indirectly, factors in abundant supply are exported and factors in scanty supply are imported.



Relative factor availability is key

- If wheat is land-intensive and the U.S. has a relatively greater supply of land than the rest of the world, then it will tend to export wheat
- $\text{U.S. land supply} / \text{U.S. labour supply} > \text{rest of the world's land supply} / \text{rest of the world's labour supply}$
- That is, there are more hectares of usable land per worker in the U.S. than elsewhere. This gives U.S. wheat production a comparative advantage
- Again, relative prices: land prices in the U.S. are lower



Special Case of the General Theory

- The Heckscher-Ohlin theory is a case of comparative advantage
- Land and natural resources are natural sources of comparative advantage
- Prices are higher or lower depending on factor availability

Examples

- Immigration restrictions reduce labour supply in the U.S., increasing wages and reducing land rents
- Densely populated Asian countries have large labour supplies
- Capital restrictions can also lead to advantages for some: countries with capital-intensive production



Factor Immobility and Comparative Advantage

- When labour and land cannot move, this is a source of comparative advantage to a country
- The optimal specialization is in areas of factor abundance

International Trade and Factor Income

- Through international trade, demand moves to immobile factors
- Factor incomes increase as they would have if factors were mobile
- In the case of labour, wages rise – but capital formation is key to reach the same level world-wide



5. The Alchian-Allen Effect

- We have so far neglected transport costs and other costs of international trade
- Such costs are important for the flow of international trade
- Specifically, such costs affect the price of goods and what kinds of goods are traded
- If the same factors of production can produce two different goods, which of the two will be traded, if any?



The Alchian-Allen Effect

- The price of two close substitutes rises by a fixed per unit amount
- Then more of the more expensive, higher quality good will be exported
- The reason: relative prices change

Example

- Suppose there are two grades of bacon produced in Denmark
- High quality bacon is sold for €20/kg and low quality bacon for €10/kg
- High quality is therefore twice as expensive
- If Danish farmers wish to export bacon, they have to take account of transport costs. Suppose these to be €5/kg
- Therefore the price German importers have to pay will be at least €25/kg and €15/kg for high and low quality, respectively



The Alchian-Allen Effect

- Which grade of bacon will they choose to export?
- The higher grade! Relatively more high-quality bacon will be exported and more low-quality sold to domestic consumers

The Reason

- The export price of high-quality bacon in export markets is lower
- only 5/3 (€25/€15) instead of 2/1 in the domestic market
- ... And so it is for all goods: relatively more of the higher quality output is exported than consumed domestically
- In the presence of trade costs, countries will naturally focus on trading those goods where trade costs are a lower proportion of revenue



6. Summary

1. Absolute advantage proves that international trade is beneficial
2. And comparative advantage proves that this is always the case
3. Even under conditions of increasing marginal costs
4. The Heckscher-Ohlin theory emphasizes the importance of relative factor availability in each country for determining comparative advantage
5. The Alchian-Allen effect helps us understand what kind of goods are traded when more than one kind of good is produced with the same factors of production



7. References

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