

# Lecture 4a RELOCE

## Interregional trade:



### **Aim:**

- To discover why regions specialise in certain commodities

### **Outcomes:**

- Awareness of Ricardian and Heckscher-Ohlin theories of regional trade
- Awareness of more radical explanations of regional trade and specialisation

### **Introduction**

Understanding why regions, and localities, specialise in making and exporting certain commodities is important to regional economists. Regional economies need to actively trade and develop the commodities in which they have a competitive advantage and are successful at making if they are to run a balance of payments surplus. Unfortunately, there is little hard data about regional trade, what there is suggests that in the UK the Southern and East Midlands regions run balance of payment surpluses and the northern regions deficits.

#### **Estimated UK regional balance of payments (£m at 1985 prices)**

Region	1980	1987
North	-840	-1,000
Yorkshire & Humberside	-300	-400
E Midlands	<b>+800</b>	<b>+800</b>
E Anglia	-80	-300
SE	<b>+1,600</b>	<b>+1,000</b>
SW	-400	-1,600
W Midlands	-600	+350
NW	-750	-1,300
Wales	-1,700	-1,600
Scotland	-2,400	-1,200
N Ireland	-1,700	-1,500

*Source: Armstrong & Taylor (1993) Original source: PA Cambridge Economic Consultants.*

*Note: Excludes North Sea oil export revenue. In these two years the UK ran an overall BoP deficit (excluding oil).*

Regions trade internationally, as well as between each other, and it is a fact that interregional trade is much freer than international trade. For regions (in the same nation) distances between markets tend to be smaller (not necessarily so in the US when contrasting it with Europe) and the institutional and monetary frameworks are usually the same. Thus they have the same currency, an integrated capital market and common banking system all of which facilitate trade. Few of the international barriers that inhibit free trade are present in interregional trade although distortions do exist, such as regional policy (labour and/or capital subsidies). However trade is much more “open” at the interregional level. In 1995 Scotland’s exports accounted for almost 80% of its GDP (69% in 1979), approximately half of which went to the rest of the UK with the other half to the rest of the world.

This openness can be illustrated using UK and European data. As world trade becomes even more open (through GATT and the European single market) so the UK’s regions become increasingly exposed to the fluctuations in world trade. Figures suggest that many countries in Europe are now almost as open as regions within a single country once were (see table). They are likely to have become even more “open” since the advent of the single currency.

Whilst the figures below show that trade between EU countries is particularly open, more recent work suggests that local as well as regional economies are increasingly trading where barriers are lowest. A recent survey of Basingstoke businesses, {CLREA University of Portsmouth 1999}, suggested that over 75% of local firms traded with other firms within the district, almost 60% traded elsewhere in the UK (outside the Thames Valley and Hampshire areas) and 27% exported overseas. Of the exporters almost all traded with the EU.

EU Country	Export of goods & services % GDP		Import of goods & services % GDP	
	1960	1996	1960	1996
Belgium	38	75	39	69
Germany	9	28	17	28
Greece	7	16	14	24
Spain	9	30	7	28
France	15	24	12	23
Ireland	30	82	36	65
Italy	13	28	14	23
Luxembourg	86	93	72	80
Netherlands	46	57	44	50
UK	21	32	22	29
USA	5	12	5	14
Japan	11	12	10	10

Source: Armstrong & Taylor (2000) taken from the European Commission 1998

Clearly regions depend on trade for their economic wellbeing, and the level (all things being equal) is likely to increase rather than decrease. Thus, understanding why some regions/localities are more successful exporters than others is important to regional economists, planners and policy makers. International trade theories are important in a regional context, particularly as regional economies (in Europe) are so open. However there is no single explanation to regional trade specialisation and there are many theories and ideas as to why this is so.

## **Regional trade specialisation:**

### **Ricardian trade theory**

Briefly, Ricardian Trade Theory stresses the gains from trade to be obtained through two countries or regions specialising in the production and export of commodities in which they have a comparative advantage. Armstrong and Taylor use the example of two regions each producing two commodities for their own consumers, without trade both regions produce these commodities only for their own populations.

A model can be constructed using Armstrong and Taylor's example. There are two regions producing two commodities, the south is more efficient at producing both commodities than the north. It takes only 2 worker-days to produce a tonne of wheat in the south but 3 in the north. Similarly it takes 10 worker-days to make a car in the south and 21 in the north. The south has an absolute advantage in producing both products, but it is the comparative (or relative) advantage that is more important because if this exists then there is the potential for economic advantage to be gained through trade.

The example finds that the south is relatively more efficient at producing cars and the north at producing wheat. To find out why we must examine the opportunity costs (*it is assumed that all labour and capital is fully employed either producing wheat or cars*). If the south wishes to produce one more car it must transfer 10 worker-days from wheat to cars losing production of 5 tonnes of wheat. Thus the opportunity cost of a car in the south is 5 tonnes of wheat. In the north it must transfer 21 worker days to produce an extra car losing production of 7 tonnes of wheat. Making the south more efficient (in opportunity cost terms) at producing cars. Looking at how much car production has to be foregone to produce an extra tonne of wheat we find that the south has to give up 0.2 of a car and the north 0.142. The north is therefore more efficient at producing wheat.

Commodity	Number of worker days to produce 1 tonne of wheat or 1 car.	
	South	North
Wheat	2	3
Cars	10	21

The existence of comparative advantage(s) means that there exists the possibility of mutually advantageous gains from trade between the two regions (*provided there are little or no barriers to trade and that transport costs are minimal*). The respective **"internal"** exchange rates for south and north are 1:5 and 1:7 (cars to wheat). Therefore it is beneficial for the south to import wheat in exchange for cars rather than switching production at home from cars to wheat (*it gets 7 tonnes by importing and 5 by switching to home production*).

If the new **"world"** exchange rate settles 1: 6 (cars to wheat) the gains from trade can be demonstrated by comparing the **internal** and **world** exchange rate ratios. The South can exchange one car for six tonnes of wheat but can only produce five tonnes of wheat by giving up production of one car. In the North the cost of importing one car is six tonnes of wheat the cost of producing it at home is seven tonnes of wheat. Thus cars will flow from south to north and wheat from north to south.

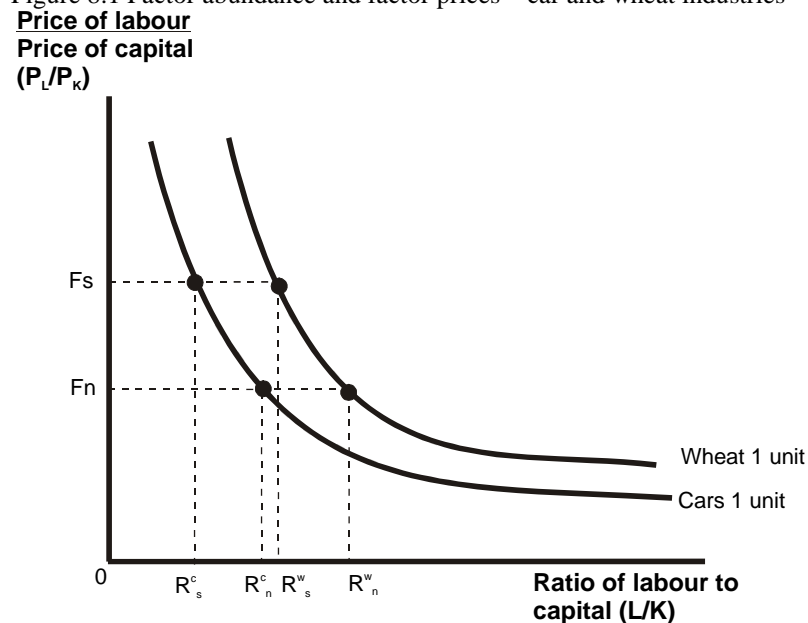
The key question is why a region has a comparative advantage. In our example the cause of comparative advantage is the differences in regional labour productivity but, does this vary considerably between regions? Could differences in technology or capital stock be the reason? Armstrong and Taylor suggest that the Ricardian model would be more realistic with the inclusion of wage differentials alongside productivity. In which case lower wages would help to offset the disadvantage of lower productivity. However they concede that the "efficient wages" version of the model has little explanatory power when applied to UK regions.

### Heckscher-Ohlin trade theorem

Following on from the simple Ricardian model Armstrong and Taylor look at the Heckscher-Ohlin theorem. This explicitly incorporates both labour and capital. In the simple version there are only two factors of production, labour and capital. The cause of comparative advantage is initial factor endowment. Each region will specialise in the commodities that use its advantageous endowment. If car production is seen as capital intensive and wheat labour intensive then using the previous hypothetical economies, the north is labour abundant and the south capital abundant thus the south will specialise in cars and the north in wheat.

This can be demonstrated with the aid of a diagramme (Figure 8.1). In the South the price of labour is high compared with the price of capital because labour is the relatively scarce factor. The south will therefore use less labour to produce a car than the north. Therefore, the south region uses a production mix that results in a low L/K ratio to produce cars point  $R_s^c$ . The North uses a higher L/K ratio  $R_n^c$ . In the case of wheat the north again uses a higher L/K factor ratio but labour is the more abundant and thus cheaper factor in the North. Note that cars require a lower L/K ratio at all possible prices than wheat.

Figure 8.1 Factor abundance and factor prices – car and wheat industries



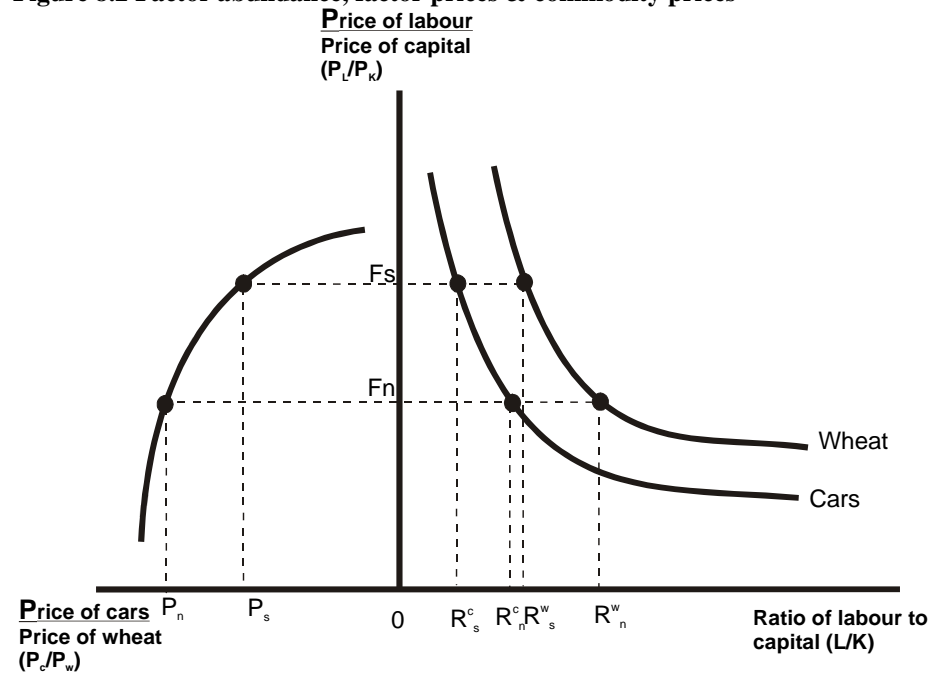
Source: Adapted from Armstrong and Taylor (2000) Fig 5.3

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Armstrong and Taylor then link commodity prices with factor abundance and factor prices (Figure 8.2). The figure shows that because capital is relatively cheaper in the south than the north and that as production of cars is capital intensive then price of cars (relative to wheat) will be lower in the south  $P_s$  than the north  $P_n$ .

**Figure 8.2 Factor abundance, factor prices & commodity prices**



Source: Adapted from Armstrong and Taylor (2000) Fig 5.4

The analysis suggests that the capital abundant region has a comparative advantage in producing the capital intensive product, (and the labour abundant region in producing the labour intensive product). Therefore, the south has a low price for cars relative to wheat and the north has a high price for cars relative to wheat. It is this difference in pre-trade price ratios that creates the climate for gains from trade.

The theory, although intuitively logical, has a number of restrictive assumptions:

1. There are only two factors of production – labour and capital
2. Factors of production are of the same quality in both regions
3. Each region's endowments of capital and labour are fixed
4. Production functions are the same in each region (no regional advantage from superior technology)
5. Production functions have constant returns to scale
6. There is perfect competition in each region's factor and commodity markets
7. Trade is free of all obstructions (tariffs etc.)
8. There is strong factor intensity at all sets of factor prices
9. Tastes are identical in all regions and do not vary with regional income levels

The weakness of the model is the unreality of many of the assumptions.

Tests have been carried out to examine the validity of the Heckscher-Ohlin theorem, the "factor content approach" and the "commodity version". The former pioneered by Leontief measures the amount of labour and capital required to produce a region's exports. These are compared with the amount of labour and capital that the importing region would need to use if it were to substitute for imports by local production. If the theorem is correct then a labour abundant region's exports will have more labour and less capital than the import substituting region, would require.

The second test involves a direct check on whether a region does specialise in production and export of commodities, which intensively use the factor that is locally abundant. There are four steps to the test:

- Identify the abundant factor
- Measure the capital intensity of production in each local industry
- Measure the extent to which a region specialises in the products of each of its industries
- Test the predictions of the theory – do labour abundant regions specialise in labour intensive industries

In reality there have been severe difficulties for researchers attempting to test the theory and the conclusion is that the Ricardian and Heckscher-Ohlin theorems of regional trade specialisation only explain part of the pattern of regional specialisation..

### **Neo-factor proportions explanations.**

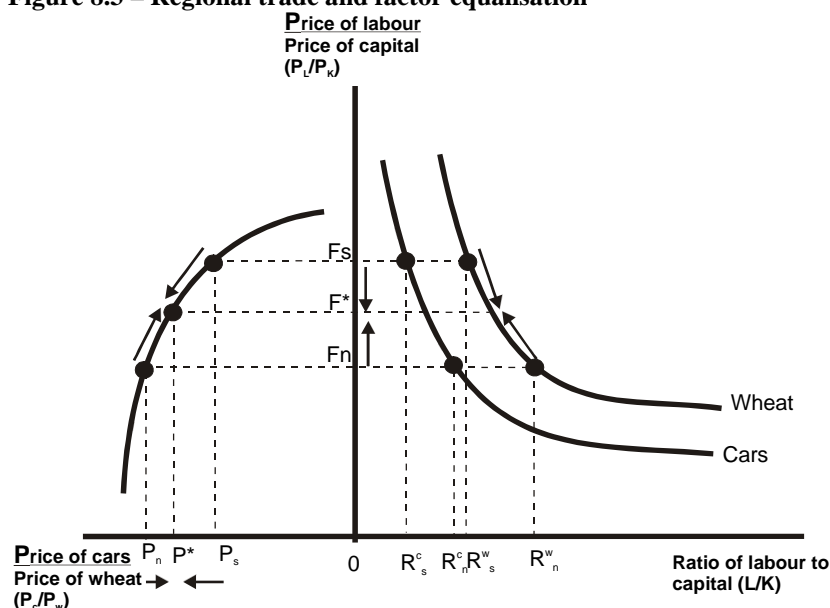
These are the generic name given to explanations, which relax some of the restrictive assumptions in the Heckscher-Ohlin theorem. The first relaxation is the assumption of only two factors of production and natural resources are introduced as a factor in their own right, this is said to generally improve the predictions of the model. Secondly, by relaxing the factor quality assumption and including human capital (skills), Armstrong and Taylor suggest that regions well endowed in skilled labour tend to specialise in skill-intensive industries. The third is the relaxation of the strong factor intensities assumption (factor reversal), if a commodity switches from labour to capital intensity above a certain relative price (see Armstrong and Taylor (1993) Figure 5.5) then regional comparative advantage changes if there are significant regional variations in factor prices. Fourth, the assumption of constant returns to scale is relaxed, this allows for the possibility of external and agglomeration economies, and although it is difficult to measure these, it is accepted that they do have a significant impact on regional trade specialisation. Last, the assumption that there is no interregional factor migration is clearly unrealistic.

### **Factor migration:**

With full factor mobility the Heckscher-Ohlin theorem breaks down because it is unable to predict the commodities in which a region will have trade specialisation, or if out-migration will erode factor abundance. Once two regions start to trade it is predicted that they will concentrate of producing the commodities in which they have a comparative advantage. Using the earlier example the north will run-down its car production and step up wheat production (releasing more capital than labour because of factor intensity), in the south the reverse will be true. As factors of production are in fixed supply, the north will be forced to substitute capital for labour leading to a fall in the labour/capital ratio. The switch to wheat in the north increases the price of labour (relative to capital) in the south the price of labour relative to capital falls. The factor price ratios in each region equate as does the commodity price ratio ( $F^*$  and  $P^*$  in Figure 8.3). Even in the absence of factor migration, factor price differences narrow and commodity trade acts as a perfect substitute for factor mobility. The region with abundant labour and low wages (north) exports the labour in two ways, out-migration and in the form of labour services embodied in the export goods. Thus trade acts as a substitute for migration by allowing a region to use its abundant factor intensively. This has two benefits:

1. Factor prices are equalised (between regions)
2. Trade specialisation is more efficient than autarky (all regions gain from trade)

**Figure 8.3 – Regional trade and factor equalisation**



Source: Adapted from Armstrong and Taylor (2000) Fig 5.5

### Radical theories:

Armstrong and Taylor examine three alternative theories in an attempt to understand regional trade specialisation.

**Intra-industry trade theory:**- suggests that there is a substantial amount of intra-industry trade between regions (exchange of virtually identical products). This happens because of imperfect competition and is brought about for two reasons, a desire (by consumers) *for a wide range of choice in products* and *economies of scale at the firm level*. Whilst firms may lose share in domestic markets from competition from imports which flood into the region to meet consumers demand for "choice", they are often opening export markets with their products against local competition, to exploit the desire for "choice" by the other regions' consumers. If they can maintain high levels of output they are also able to exploit economies of scale at the same time. Armstrong and Taylor suggest that the level of intra-industry trade is highest in closely integrated economies, particularly in the EU. Although regional data is scarce, analysis at the national level (in the EU) suggests that intra-industry trade is higher in the more developed (industrialised) northern countries of the EU (UK, Germany, France, etc.) than in those of the south (Greece and Portugal), which rely more on inter-industry trade (different commodities). More recent work in the same field, Greenaway (1995), suggests that intra-industry trade is of two types:

**Horizontal** where goods of roughly the same quality are traded (as above) and

**Vertical** where goods are exchanged within the same industry but at different levels of quality and at different stages in the production chain. This it is suggested is strongly influenced by factor endowments. It is estimated that between 25% and 40% of trade between the EU and Eastern Europe is intra industry trade but only 10 to 20% is horizontal the rest is vertical. As Eastern Europe is increasingly providing cheaper intermediate goods for Western European industries, a similar situation exists between Mexico and the USA (last week).

## Competitive advantage

This stresses the importance of mutually reinforcing competitive advantage. To some extent this is similar to the arguments about agglomeration economies and industrial clusters. This is in complete contrast to the assumption of constant returns to scale as used in the Heckscher-Ohlin model.

Armstrong and Taylor draw on the work by Porter, which stresses the importance to four sets of competitiveness-enhancing factors. They reinforce one another and generate a situation of cumulative causation. The most widely cited example in the literature is of Northern Italy and in particular the food, clothing, household goods and drink manufacturing industries.

The factors that must be in place are:

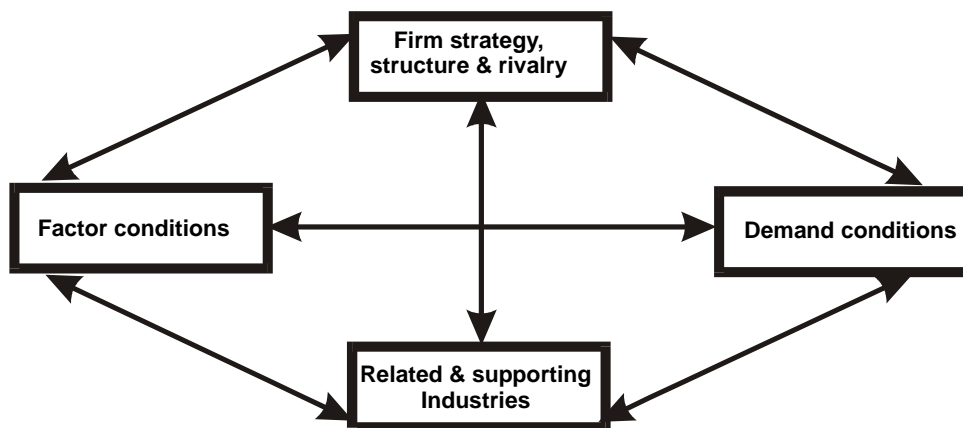
**Favourable Demand conditions** - strong, sophisticated home demand, which ensures that local firms are innovative and respond rapidly to changes in tastes.

**Factor conditions** - factors are not just inherited but refined and developed over time, (e.g. specialised labour with specific rather than general skills).

**Firm strategy, structure and rivalry** - competition between local firms, creation of the best possible business environment in which firms can be created, survive and thrive, probably relying on co-operation as much as competition.

**Related and supporting industries** - ready access to supply chain industries and closeness of related industries.

Figure 8.3 - The determinant of competitive advantage



Source Armstrong and Taylor (2000) Figure 5.6; original Porter (1990)

The importance for the region is the interactions between the various factors. For instance, a strong home demand for commodities is likely to stimulate firms, or government, to set in place training schemes to ensure a supply of the unique skills required by the workforce.

Porter's model is not formalised but draws on a number of case studies - not all regions are likely to have all the elements in place thus there are likely to be regionally different outcomes. Other researchers have come up with other factors that lead to competitive advantage e.g. control of resources, innovativeness, reputation, and industry arrangements (sub-contacting and franchising).

## New economic Geography models of trade

These are a group of theories based on new trade theories, they try to explain intra-industry trade and the phenomenon of trade between the larger developed countries of the world. As such they focus in on industries characterised by economies of scale and imperfect competition, which lead to competitive advantage by countries with the biggest markets or access to wider markets. This is known as the **home market effect**, locations best suited to serving the "home" market have competitive advantage (economies of scale) Good access = higher wages and a net export of manufactured goods.



New Economic Geography theory, suggest that market access alone is not a sufficient explanation. Regions with a head start find that their market advantage is enhanced by other factors which lead to a process of cumulative causation. In *footloose labour* models once a region gets a head start and manufacturing firms begin to congregate in the region mobile labour is also drawn into work at the firms. This further stimulates the home market (expenditure shifting effect) encouraging yet more firms to come in. On the growing region's labour market supply-side upward pressure of wages is held in check by the influx of new labour. On the product-market side it is suggested that commodity prices may also be lower because they are free of transport costs. Combined this is referred to as the **cost-shifting effect**. Thus the two effects are reinforcing each other and the home market effect.

A further variation in the New Economic Geography theory is the *vertically linked industries model*. In this model cumulative causation is driven by intermediate goods producers moving to the growing region the clustering of input-output industries cut assembly and distribution cost to reinforce the competitive advantage of the region with a head start.

Most New Economic Geography approaches focus in on only two of the many centripetal and centrifugal forces which effect industrial agglomeration. Krugman (1998), *What's new about the new economic geography*, Oxford Review of Economic Policy suggests that there are a number of factors at work.

Forces affecting Geographical Concentration	
Centripetal forces	Centrifugal forces
Market-size effects (linkages)	Immobile factors
Thick labour markets	Land rents
Pure external economies	Pure external diseconomies

Source: Krugman (1998)

The growing body of empirical evidence suggests that "geography still matters" when it comes to trade despite the decline of costs (transport) and other barriers. The evidence from the USA is that industry does in fact concentrate whilst there is less evidence in Europe this is thought to be because the USA has a longer record of integration (by states) and that this will in fact be the future pattern for the EU.

## Conclusions

The Heckscher-Ohlin theorem predicts that local factor abundance is a reason for regional specialisation, although empirical testing suggests that it is only part of the answer. It is clear that a range of factors effect a region's specialisation including those that originate outside the region itself and these have been developed and incorporated into the new more radical theories of intra-industry trade, competitive advantage and new trade theories.

## Next Week Interregional Migration