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Useful websites

For a non-institutional view of the CAP, and a series of readable and informative essays, see http://members.tripod.com/~WynGrant/WynGrantCAPpage.html.

The Commission's website http://europa.eu.int/comm/agriculture/ provides a wealth of data and analysis, although much of it is politically constrained to be fairly pro-CAP. The US government's Agricultural Department provides even more analysis and tends to be more openly critical of the CAP; the pages of the Economic Research Service are especially informative. See http://www.ers.usda.gov/publications/wrs-international-agriculture-and-trade-outlook/wrs992.aspx#.VDvgvPmSy40.

Every year, the OECD publishes an excellent report on the agricultural policy of all OECD members (this includes the CAP). For the latest figures and exhaustive analysis, see www.oecd.org.

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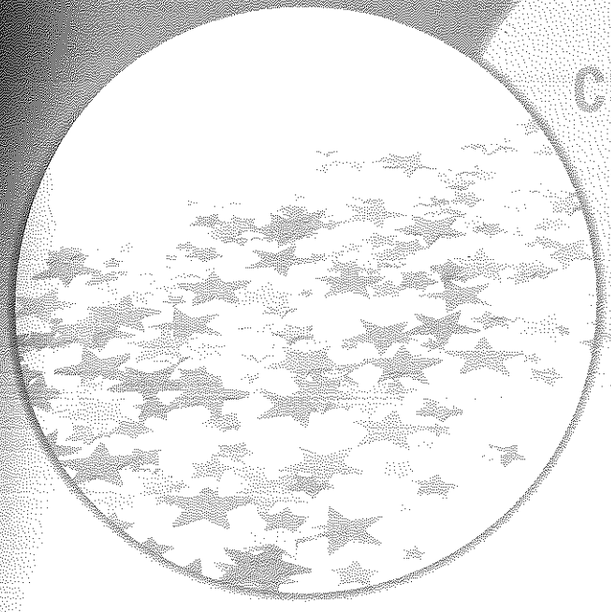


Chapter

[T]he Community shall aim at reducing disparities between the levels of development of the various regions and the backwardness of the least favoured regions or islands, including rural areas.

Treaty on the European Union, Maastricht, 1992

Location effects, economic geography and regional policy

Chapter Contents

Introduction

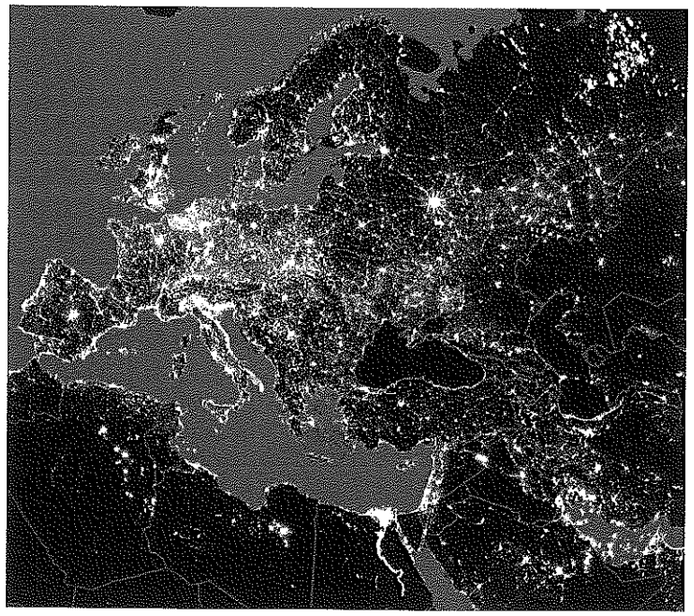
When deeper European economic integration took off in the 1950s, rural Europe was really poor. Electricity and telephones were far from standard in rural households and many were without indoor plumbing. Europe as a whole was booming, but cities and a few industrial regions were leaving rural Europe behind. The EU's founders made a concern for rural Europe one of the key goals of European integration. As the 2004 and 2007 enlargements added large swathes of poor rural areas to the EU, helping Europe's rural communities remains a touchstone of today's EU.

This chapter looks at the facts, theory and policy connecting European integration to the location of economic activity in Europe.

10.1 Europe's economic geography: the facts

Regional incomes in the EU follow a clear pattern. Rich regions are located close to one another and form the 'core' of the EU economy. Poor regions tend to be geographically peripheral (see Combes and Overman, 2004, for more details). These points are made clear in Figure 10.1, which shows a map of Europe's night-time light pollution. Since light pollution lines up very closely with economic activity at this scale, we can think of such pollution as revealing the spatial distribution of economic activity. The 'heart of Europe' is clearly made up of western Germany, the Benelux nations, north-eastern France and south-eastern England. This region contains only one-seventh of the EU's land but a third of its population and half of its economic activity. It is the economic centre of Europe. Roughly speaking, the concentration of economic activity drops as one moves away from the core, although the map shows that there is also a massive concentration of economic activity in northern Italy and various hot spots in Iberian and Nordic regions.

Figure 10.1 Europe at night – light 'pollution'



© National Oceanic and Atmospheric Administration (NOAA)

The map also serves to make an important point about nations and regions. The focus of our analysis in the earlier chapters has been on nations' economies and the integration of nations. Looking at Figure 10.1, it is not hard to see that national borders are not really the best way to think about economic activity in Europe. In short, regions matter.

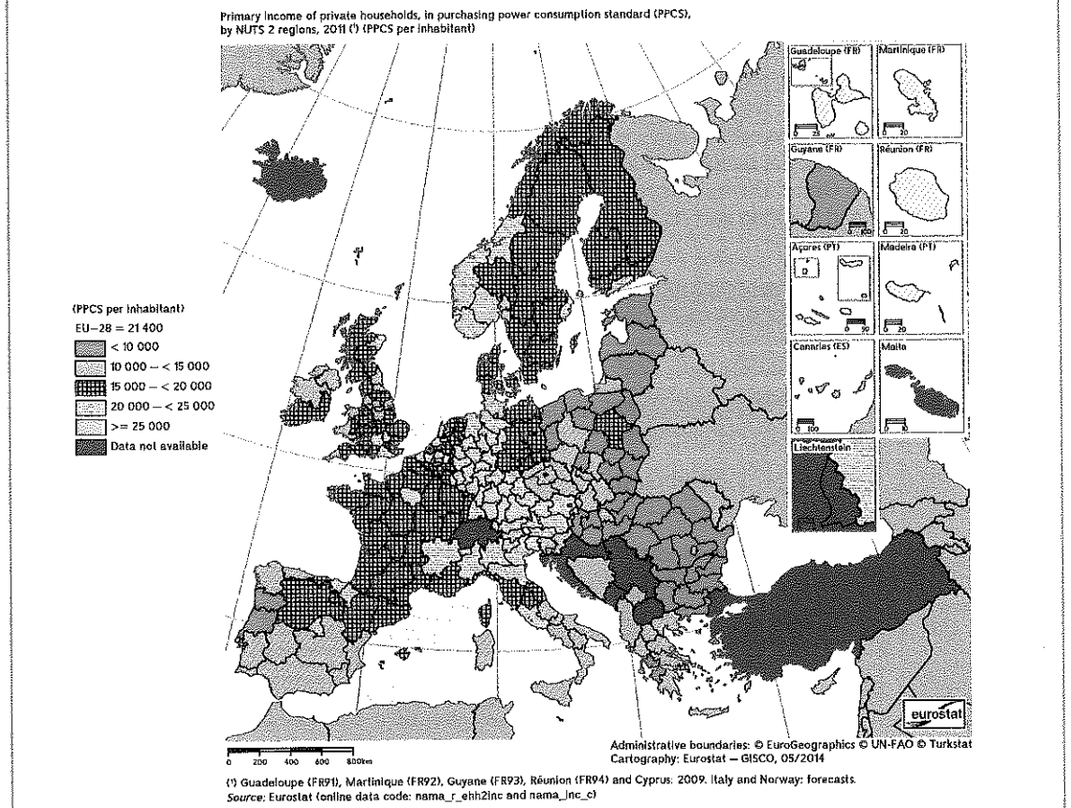
Although distance is continuous, when we discuss the economics below we frequently refer to the 'core' and the 'periphery'. The core is the regions with the brightest lights in Figure 10.1, the rest is the periphery. Plainly, it is very blunt to put regions into just two categories, but it proves analytically convenient.

10.1.1 Why does peripherality matter?

Why should anyone care about the location of economic activity? There are, after all, very few people in northern Finland. Why is it a problem that there is also very little economic activity there? For reasons we discuss below, incomes tend to be lower for people living in the periphery regions – although, as always, there are exceptions, especially around key but remote cities such as Rome, Madrid, Dublin, Edinburgh, Stockholm and Helsinki (see Figure 10.2). Note that:

- Most regions in the 12 new members have incomes that are below those of the EU15 nations. The differences are stark. The poorest region in the EU27 is Severozapaden in Romania, which has a per-capita income that is 28 per cent of the EU27 average. The richest region, Inner London, had an average income that is 343 per cent higher than the EU27 average.

Figure 10.2 Income disparity in the EU, 2010 (regional GDP per capita adjusted for purchasing power)



(1) Guadeloupe (FR91), Martinique (FR92), Guyane (FR93), Réunion (FR94) and Cyprus: 2009. Italy and Norway: forecasts.
Source: Eurostat (online data code: nama_r_ehh2inc and nama_inc_c)

Source: © European Commission, http://ec.europa.eu/regional_policy/what/future/publication/index_en.cfm

- Apart from the western-most and southern-most parts of the Continent, none of the EU15 regions have incomes below 75 per cent of the EU27 average. Although it is not shown on the map, the northern extremes of the Continent would also have very low incomes if it were not for the colossal income transfers and special programmes undertaken by Sweden and Finland. One of the most striking things about the map is how regional incomes seem to fall in relation to the region's distance from the 'heart of Europe' (again apart from the Nordic cases).

The wide disparity in income levels is a problem from a social point of view, but it is also a problem from the political perspective. Large income gaps between regions foster bitter political disputes that can hinder cooperation on things such as European integration. Giving the poorer regions hope that they will catch up is an important role for the EU's regional policies.

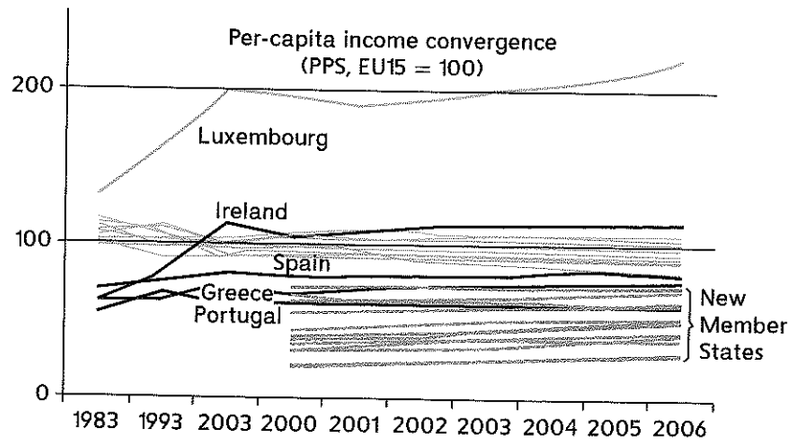
The disadvantages of the poor regions range much further than low incomes. A range of standard indicators of social misfortune suggest that many of Europe's poor regions have a variety of problems. For instance, the poor regions also often have higher levels of youth unemployment and long-term unemployment and lower levels of investment and education.

Much more detail on the state of the regions is available in the 'Eurostat regional yearbook', for example Eurostat (2013). Eurostat's online database also allows you to generate your own custom-made maps based on unemployment, income, tertiary education and so on.

10.1.2 Evolution over time: narrower national differences, wider regional differences

While the dispersion of income levels across nations is still very high, the gaps among EU members have been steadily narrowing, as Figure 10.3 shows. The EU15 members have on average seen a significant convergence of their incomes with the EU15 average (shown in each year as EU15 = 100). Note that Sweden, Finland and Austria only joined in 1995, but had participated in much of the economic integration with the EU even before they joined (see Chapter 1). The real success stories are Spain, Portugal, Greece and, above all, Ireland, which went from being one of the poorest to the second-richest Member State. The obvious exception to the convergence story is Luxembourg, which started above average and continued to diverge. The fact that it is a net recipient of EU funds (see Chapter 3) has little to do with this performance; most of it is due to the Grand Duchy's development of a highly lucrative financial service sector based in part on its low taxes and banking secrecy.

Figure 10.3 Income convergence among old EU members, 1983–2005



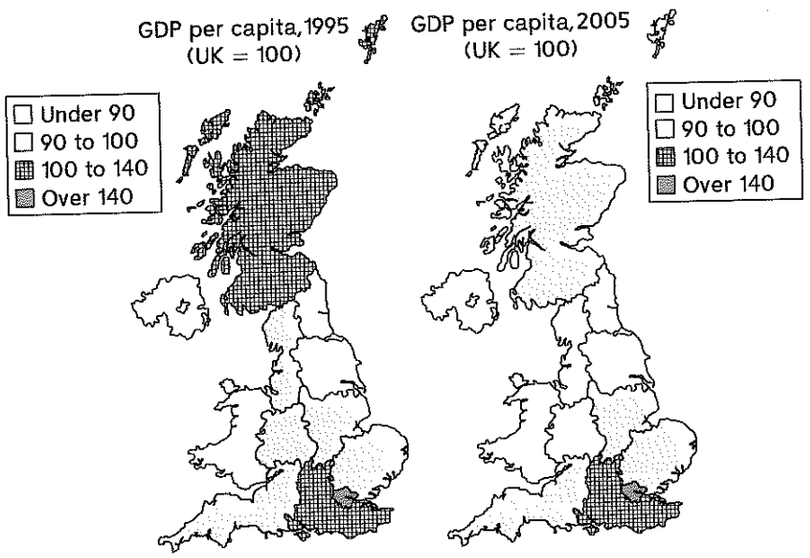
Sources: Eurostat Regional Yearbook (various years), and First Convergence Report (http://europa.eu.int/comm/regional_policy/sources/docoffic/official/repor_en.htm)

The convergence of the new Member States is also clear in the chart, although the process has been gradual and their membership in 2004 did not lead to any visible jump.

Divergence within nations

The convergence across nations, however, hides an important trend. Income inequality across regions within each EU nation has been rising steadily. We can see this clearly by taking the example of the UK. The left-hand map in Figure 10.4 shows the distribution of per-capita income in 1995, region by region. The right-hand map shows the same for 2005. To ease comparison between 1995 and 2005, we look at each region's per-capita income compared to the UK average. Thus a region with a per-capita income equal to 100 is just at the UK average, while those with figures below 100 have below-average incomes. In 1995, Greater London was the only region with more than 140 (i.e. more than 40 per cent above the UK average). Two other regions – Scotland and the region below London – had above-average incomes. All the rest had below-average incomes. In 2005, London retained its first place but Scotland was no longer above average. Additionally, two of the regions in the west saw their incomes drop below 90 per cent of the average. Overall, there is a clear increase in regional inequality between 1995 and 2005.

Figure 10.4 GDP per capita in British regions, 1995 vs. 2005



Source: Authors' calculations based on Eurostat data

A similar pattern holds generally across the EU. For example, Poland has been growing rapidly during this time and in fact all regions saw their incomes rise. However, some regions – such as Warsaw – grew much faster than others, so their share of Polish GDP rose. Roughly speaking, regions with low per-capita incomes have lost out in the race for national GDP shares. In short, inequality among regions within EU nations has risen. There are many exceptions, as always. For instance, western French regions have seen their GDP shares rise, as have some of the poorer parts of southern Italy, but even in equalitarian Sweden, the northern regions have shrunk relative to the rest of the nation.

10.1.3 Integration and production specialization

The evidence presented up to this point suggests that European economic integration has had only a modest impact on the location of economic activity as a whole, with the many changes occurring within

nations rather than across nations. Lumping together all economic activity (i.e. measuring activity by total GDP), however, may hide changes in the composition of economic activity within each nation or region. European integration may have encouraged a clustering of manufacturing by sector rather than by region. To explore this possibility, we look at regions' and nations' industrial structures and their evolution. We focus on industry since it is difficult to get comparable data on services.

Figures for European nations

Using a particular measure of specialization – called the Krugman specialization index – we look at how different the industrial structures are in various European nations and how they have evolved. The Krugman index tells us what fraction of manufacturing activity would have to change sector in order to make the particular nation's sector-shares line up with the sector-shares of the average of all other EU15 nations.

The indices for the EU27 are shown in Table 10.1. Since almost all the changes are positive, we conclude that the industrial structures of most nations are diverging from the average EU industrial structure. In other words, taking the EU average as our standard, most European nations experienced an increase in the extent to which they specialized in the various manufacturing sectors. The only major exception is that of Spain, whose industrial structure became substantially more similar to the EU average over this period.

Table 10.1 Specialization by nations, 1980–1997

	1980–83 (%)	1988–91 (%)	1994–97 (%)
Ireland	62	66	78
Greece	58	66	70
Finland	51	53	59
Denmark	55	59	59
Portugal	48	59	57
Netherlands	57	55	52
Sweden	39	40	50
Belgium	35	38	45
Italy	35	36	44
Germany	31	35	37
Austria	28	28	35
Spain	29	33	34
UK	19	22	21
France	19	21	20
EU15 average (weighted)	30	33	35

Source: Midelfart-Knarvik et al. (2002)

How important is this increase in specialization? To take one example, Ireland's index in 1970–73 was 70 per cent, which means that 35 per cent of total production would have to change sector to bring it into line with the rest of the EU. Ireland's index had increased by 8 per cent by 1997, so by that year 38 per cent of Ireland's manufacturing would have to change sector to get in line with the EU average. For most EU nations, the change has been fairly mild, to the order of 5 or 10 per cent.

10.1.4 Summary of facts

To summarize, the facts are:

- Europe's economic activity is highly concentrated geographically at the national level as well as within nations.
- People located in the core enjoy higher incomes and lower unemployment rates.
- While the income equality across nations has narrowed steadily with European integration, the geographical distribution of economic activity within Member States has become more concentrated (taking income per capita as a measure of economic activity per capita).
- As far as specialization is concerned, European integration has been accompanied by only modest relocation of industry among nations, at least when one lumps all forms of manufacturing together.
- The little movement that there has been tends to lean in the direction of manufacturing activities having become more geographically dispersed across nations, not less.
- Most European nations have become more specialized on a sector-by-sector basis.
- At the sub-national level, we see that industry has become more concentrated spatially.

10.2 Theory part I: comparative advantage

We now turn to the economic logic that connects European integration and the location of economic activity, focusing on two aspects in particular: specialization at the international level and agglomeration at the international level.

To keep things simple, we consider each effect in isolation, using a separate framework for each. The first framework focuses on natural differences among European nations – what economists call comparative advantage. The second framework – which is presented in the following section – focuses on the tendency of closer integration to encourage the geographic clustering of economic activity.

10.2.1 Comparative advantage and specialization

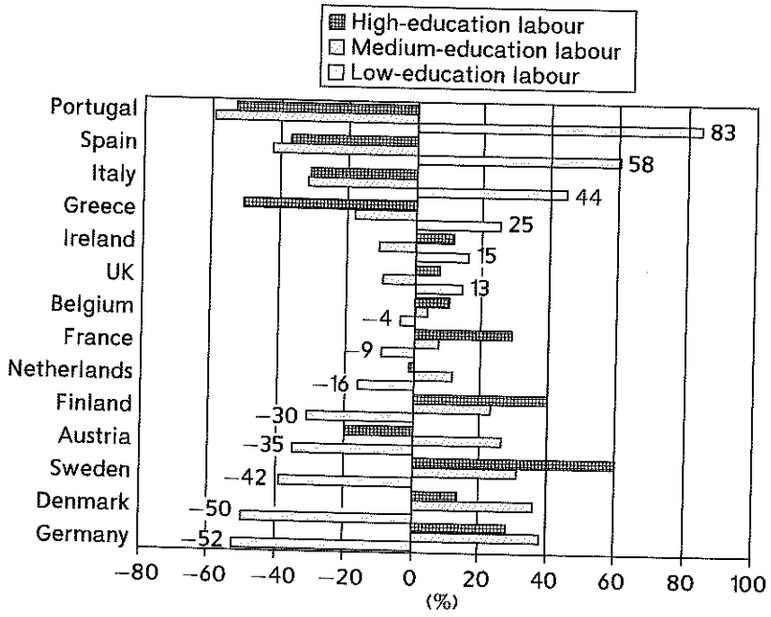
Opening up trade between nations raises economic efficiency. This is just the 'magic of the market'. When trade is very difficult, each nation has to make the most of what it consumes. Trade allows nations to 'do what they do best and import the rest'. Trade allows a nation to concentrate its productive resources in sectors where it has an edge over other nations. The jargon word for the edge is 'comparative advantage'. This consequence of liberalization can have important effects on the location of industry because it encourages a nation-by-nation specialization. The main purpose of this section is to explain how comparative advantage and European economic integration help explain the type of industrial specialization that happened in Europe in the 1980–97 period and is likely to continue into the future.

An example

To see the basic idea more clearly, think about what Europe would look like without any trade. European nations have different supplies of productive factors – and different types of goods use factors in different proportions – so without trade the output of a nation would be largely determined by its supplies of factors. Focusing on labour supplies, consider the current distribution of labour among EU members, dividing labour into three types: those with little education (less than secondary), those with at least secondary education, and highly educated workers (researchers). To make the numbers comparable, we compute each nation's supply of low-education workers relative to its total supply of workers and compare this to the same ratio calculated for the EU as a whole (EU's supply of low-educated labour to overall labour) – and we do the same for the other two labour types.

The numbers are shown in Figure 10.5. For example, we see that Portugal's supply of low-education workers (divided by Portugal's total supply of workers) is 83 per cent above the EU average. Germany's is 52 per cent below the EU average. Now consider what this means for the price of a good that uses low-education labour intensively, such as clothing. Without any trade, Germany and Portugal would have to

Figure 10.5 Relative labour endowments in Europe



Source: Data from Midelfart-Knarvik et al. (2002)

ake all their own clothes. Since the factor that is used intensively in clothes production is relatively undant in Portugal and relatively scarce in Germany, we should expect clothing to be more expensive in ermany than in Portugal, if there were no trade.

Now think about what would happen if trade between Germany and Portugal opened up. Since clothes e relatively cheap in Portugal, we would see Portugal exporting clothing to Germany. But what would ermany export to Portugal in exchange? As Figure 10.5 shows, Germany is relatively abundant in gh-education labour. Using the same logic that told us clothing would be relatively cheap in Portugal ithout trade, we know that goods that are intensive in their use of high-education labour – for example, harmaceuticals – would be relatively cheap in Germany. In this highly simplified world with trade only etween Portugal and Germany, we would see Portugal exporting clothing (and other goods that are tensive in the use of low-education labour) in exchange for pharmaceuticals (and other goods that are tensive in the use of high-education labour) from Germany.

Germans would get their clothes for less and Portuguese would get the pharmaceuticals for less, so s exchange would be good for both nations (although individual workers might be hurt by the implied ructural adjustment). The key to this 'gain from trade' is the way in which trade allows for a more efficient ocation of production across countries. Instead of each nation having to make everything it consumes, de allows production to locate in its 'natural' place. In this case, some production of low-education-ensive goods shifts to the nation that is relatively abundant in this type of labour.

Before turning to the main point – the implication of this trade liberalization for the spatial allocation of nufacturing – it is worth stressing the logical necessity of each nation having a comparative advantage something. The way we defined our measure of relative factor abundance, each nation's labour supplies st either be exactly in line with the EU average (Belgium's is very close to this), or it must be abundant some types of labour and scarce in others. Thus, without trade, each nation would have some goods that re relatively expensive and some goods that were relatively cheap. This type of comparative advantage,

based on relative factor endowments, is known to economists as 'Heckscher–Ohlin' comparative advantage (it is named after the two Swedish economists who worked out its logic in the 1920s and 1930s).

The spatial implications of Heckscher–Ohlin comparative advantage

How does trade change the geographical pattern of production in this framework? In the example, trade induces an expansion in Portuguese sectors that are intensive in the use of low-education labour. Since the resources needed to expand output in these sectors must come from somewhere, trade also induces a contraction of other Portuguese sectors, in particular the sectors that had relatively high prices without trade, e.g. pharmaceuticals and other goods that are intensive in the use of high-education labour. In the simple example, the mirror-image shift would occur in Germany's industrial structure. If we view this from the international level, the resulting structural changes would look like a shift of clothing production from Germany to Portugal and a shift of the production of pharmaceuticals in the opposite direction. As a result, the industrial structures of both Portugal and Germany would become more specialized.

Of course, European integration is not limited to two nations. Allowing for many nations makes the analysis much more difficult, but it does not change the basic results that freer trade induces nations to specialize in producing products that they are relatively good at and importing products that they are relatively bad at producing. Consequently, trade liberalization of any type – including European economic integration – tends to lead nations to specialize on a nation-by-nation basis. Economic resources get shifted between sectors within each nation and, as a result, it seems as if production is being reallocated sector by sector across nations.

From the point of view of economic geography, this shows up as an increase in national specialization sector by sector. While this is not the only possible explanation for the increased specialization we saw in Table 10.1 (more on this below), it provides a very natural way of understanding why European integration was so systematically associated with an increase in specialization by nation.

We turn now to the logic behind the increased concentration of economic activity within European nations.

10.3 Theory part II: agglomeration and the new economic geography

The deep economic logic of the comparative advantage mechanism just discussed concerns how a nation's productive factors – i.e. its capital, skilled and unskilled labour, etc. – are employed *across sectors within the same nation*. To keep things simple, we implicitly assumed that there was only one region per nation so the issue of the geographic location of economic activity within a nation never arose.

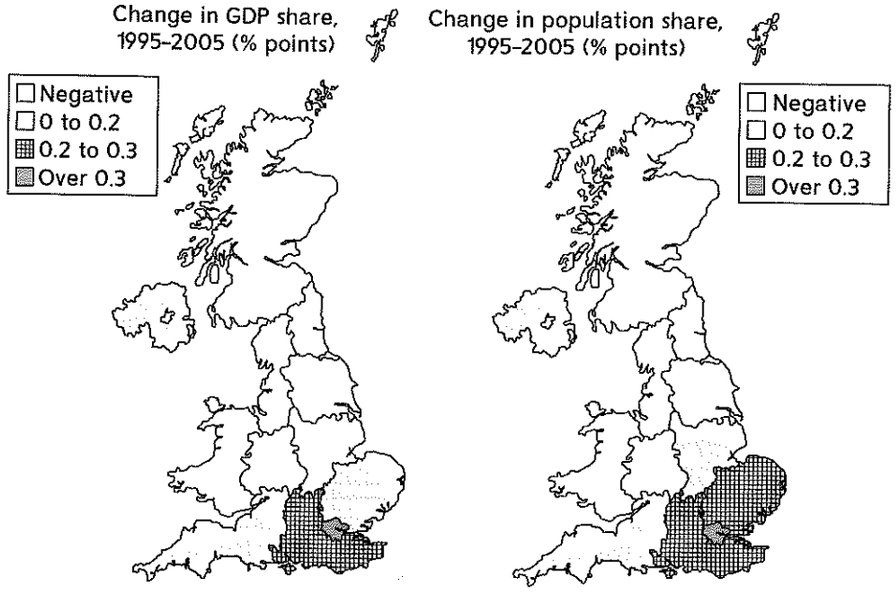
In this section, we switch to the opposite extreme, where the key question is: 'How does European integration affect the location of economic activity *across regions within the same nation*?' To keep things simple, we assume that there is only a single industry in a nation but several regions within the nation.

The basic issues we are trying to understand in this section can be illustrated with a pair of maps – one showing the geographic distribution of economic activity (i.e. GDP) and one showing the population. Economic integration within the UK has, for decades, encouraged the shift of economic activity within Britain towards southern England. The facts for the 1995–2005 period are shown in Figure 10.6. The left-hand map shows how each region's share of the UK's total economic activity has changed; darker colours indicate bigger increases. The right-hand map shows the same figures for regional population shares.

The dominant fact that emerges clearly from the maps is that the rise in GDP shares is closely matched by the rise in population shares. In other words, what we see here is a movement of productive factors across regions within a nation. Economic activity and population are agglomerating in southern England. Population figures are easy to obtain, but if we could find regional statistics on capital stocks and other types of productive factor, we would see the same pattern of spatial agglomeration accompanied by a spatial agglomeration of productive factors.

But what causes what? Is economic activity clustering in southern England because this is where the workers are clustering, or is it the other way around? To organize our thinking on this question and related questions, we need to study the basic elements of economic geography. In what follows, the concepts are introduced with verbal logic alone.

Figure 10.6 Shifts of economic activity across regions: UK



Note: All UK NUTS1 regions grew in nominal terms in this period, but since some grew faster than others the share of total UK GDP rose in the fastest-growing regions and fell in others.

Source: Authors' calculations on Eurostat data downloaded September 2008

10.3.1 Agglomeration and dispersion forces in general

The logic of economic geography rests on two pillars – dispersion forces and agglomeration forces. Agglomeration forces promote the spatial concentration of economic activity while dispersion forces discourage such concentration. The spatial distribution of economic activity at a moment in time depends upon the balance of the pro-concentration (agglomeration) forces and anti-concentration (dispersion) forces. The main question we want to answer is: 'How does European integration affect the equilibrium location of an industry?' To set the stage for the equilibrium analysis, we first consider dispersion and agglomeration forces in isolation.

Dispersion forces

Dispersion forces favour the geographic dispersion of economic activity. Land prices are the classic example. The price of land – and therefore the price of housing, office space, etc. – is usually higher in built-up areas, such as Central London, than it is in rural areas, such as North Wales. What this means is that if everything else were equal, firms and workers would prefer to locate in less built-up areas. Of course, we know other things are not equal, but the forces that make built-up areas more attractive are called agglomeration forces and we put them aside for the moment to focus on dispersion forces. Dispersion forces counteract agglomeration forces by increasing the attractiveness of less-developed regions. In addition to land prices, there are several other forms of congestion-based dispersion forces; these get their name from the fact that living in a congested area has many downsides (light, noise and air pollution, etc.).

While congestion-based dispersion forces are important in the real world, we shall ignore them in our theory. There are two very good reasons for this. First, such dispersion forces are not changed by European economic integration. Thus, when we go to see how European integration affects the geographic dispersion of economic activity, consideration of such forces will not add anything important. Second, including such forces in our theory complicates matters, so for simplicity's sake we put them aside. (See Box 10.2 for what happens when they are put back into the framework.)

The only dispersion force we consider is the so-called local competition force. That is, given trade costs and imperfect competition, firms are naturally attracted to markets where they would face few locally based competitors. For example, an entrepreneur thinking about setting up a new convenience store is likely to choose a location that is far from other competitors. In seeking to avoid local competition, firms spread themselves evenly across markets. In this way, local competition tends to disperse economic activity.

Agglomeration forces

An agglomeration force exists when the spatial concentration of economic activity creates forces that encourage further spatial concentration. This definition is more circular than the straight-line chain of causes and effects usually presented in economics. This circularity, however, is the heart of the subject. To return to the question of causality raised by the comparison of maps in Figure 10.6, the answer is that workers move because the jobs concentrate *and*, at the same time, the jobs concentrate since workers concentrate.

There are many agglomeration forces, but some of them operate only on a very local scale. These explain, for instance, why banks tend to group together in one part of London while dance clubs cluster in another part of the city. The study of agglomerations at this level – it is called urban economics – is fascinating, but it is not the level of agglomeration that interests us. European policy is concerned with the impact of European integration on agglomeration at the level of regions and nations. At this geographic level, many of the city-level agglomeration forces are unimportant. The two most important agglomeration forces that operate across great geographical spaces are called demand linkages and cost linkages (also known as backward and forward linkages, respectively).

Demand-linked and cost-linked agglomeration forces

To illustrate the circular-causality logic of demand-linked and cost-linked agglomeration forces as simply as possible, we make a couple of bold assumptions. First, we assume that firms will choose one location (see Box 10.1 for the economics behind this assumption). Second, we assume that there are only two possible locations, a region called 'north' and a region called 'south'. The demand-linked circular causality rests on market-size issues (hence its name). Firms want to locate where they have good access to a large market. Consider the UK example again. In 2005, much but not all UK demand was in southern England. If a firm locates in the north, it incurs high shipping costs when selling to southern customers, although it has low costs when selling to customers in the north. (It is cheaper to sell to nearby customers.) Since there are more customers in the south, northern firms can reduce their shipping by moving to the south. This is where the circular causality of demand linkages starts. Other things equal, firms want to be in the big market.

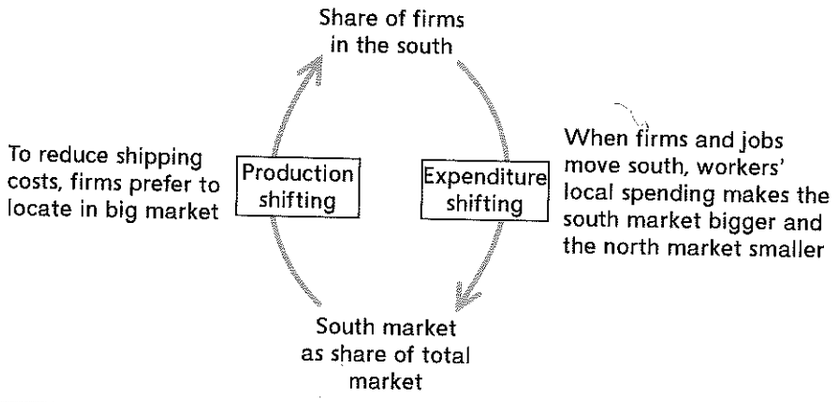
Box 10.1 How scale economies force manufacturing firms to choose a location

By definition, a firm that is subject to scale economies is one whose average cost – i.e. the per-unit cost – of producing a good falls as the scale of production rises. This means that firms whose production is subject to scale economies will benefit from concentrating production in a single location – think of it as a single factory, rather than setting up a factory near every market. For example, contrast the production of car engines, which is marked by huge scale economies, with the production of cheese, which is economical even at fairly low levels of output (there are thousands of these around Europe). Owing to scale economies, most European car companies make all engines of a particular type in a single factory located somewhere in Europe. The reason is that the per-engine cost of production is much lower in big factories. When it comes to cheese, however, the cost reduction from having a single massive cheese factory would not lower per-kilo production costs by much. For this reason, companies tend to put cheese factories near the milk production rather than ship massive quantities of milk to a massive cheese factory.

The causality becomes circular because the movement of firms from the small market in the north to the big market in the south makes the big market bigger and the small market smaller. The reason is that, by moving to the south, the firms create jobs in the south and this induces workers to move to the south. This affects market size since workers tend to spend their incomes locally. For example, when a firm leaves Dijon to set up in Paris, it moves jobs to Paris. This makes it somewhat harder to get a job in Dijon and somewhat easier to get a job in Paris, so this move encourages workers to move to Paris. We call this an 'agglomeration force' since spatial concentration (the Dijon-to-Paris move) of economic activity creates forces (the change in market sizes) that encourage further spatial concentration.

The basic idea is illustrated in Figure 10.7. It is useful to separate two things that are closely related: market size (i.e. 'south market as a share of total market', or the spatial distribution of firms), and firm location (i.e. 'share of firms in the south', or the spatial distribution of firms).

Figure 10.7 Demand-linked circular causality



Starting from the left arrow, we see that the market size affects the location of firms. The logic rests on firms' desire to minimize shipping costs. The right arrow shows that the location of firms affects relative market size. The logic is simply that firms employ workers and workers tend to spend their incomes locally. If no dispersion forces were in operation, this circular causality would continue until the north was entirely empty of jobs and firms.

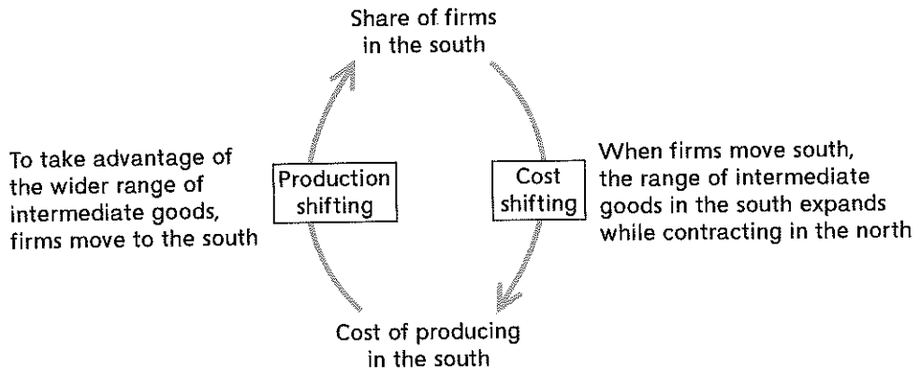
This brings us to the second major type of agglomeration force: cost-linked circular causality. This agglomeration force works in a fashion that is similar to demand-linked circular causality, but it involves production costs rather than market size.

It is a fact that, in the modern economy, firms buy plenty of things from other firms. These range from raw materials and machinery to specialized services such as marketing, accounting and IT services. Since it is cheaper to find and buy such input from firms that are nearby, the presence of many firms in a location tends to reduce the cost of doing business in that location. Thinking this through, we can see that a similar circular causality will encourage agglomeration. Figure 10.8 helps explain this.

The figure separates two things that are closely related but worth keeping distinct: firm location (i.e. 'share of firms in the south', or the spatial distribution of firms), and the cost-advantage of producing in the big market (i.e. 'cost of producing in the south', or the spatial distribution of production costs).

Starting from the left arrow, we note that, if many firms are already in the south, then doing business in the south will – all else equal – be cheaper than doing business in the north. This production-cost differential influences the location of firms. The right arrow shows how the relocation of firms from the north to the south tends to improve the business climate in the south and worsen it in the north, at least in terms of the range of available inputs. Again, if there were no dispersion forces (e.g. wages in the north being lower than those in the south), this circular causality would empty out the north entirely.

Figure 10.8 Cost-linked circular causality



In other words, cost-linked circular causality describes the way in which firms are attracted by the presence of many suppliers in the big market and how firms moving to the big market widens the range of suppliers and thus makes the big market even more attractive from a cost-of-production point of view.

10.3.2 The locational effects of European integration

European integration affects the balance of agglomeration and dispersion forces in complex ways. Such complexity is important for understanding the real world since – as the facts presented above show – the locational effects of European integration are far from simple. The best way to understand this complex logic, however, is to follow the principle of progressive complexity. We start with a set of simplifying assumptions that allow us to focus on the critical logical relationships. Once we have understood this logic in a simplified setting, we add back in complicating factors.

A very simple analytic framework

To simplify, we start by assuming away all dispersion forces except 'local competition'. We also assume away cost-linked circular causality (by assuming firms buy no intermediate inputs). This leaves us with only one pro-agglomeration consideration and one pro-dispersion consideration:

- The pro-agglomeration force is that firms would, all else equal, prefer to locate in the big market in order to save on trade costs, i.e. to be close to more of their customers than they would be if they were located in the small market.
- The pro-dispersion force is that firms would, all else equal, prefer to be in the market where there are few local competitors and that means locating in the small market.

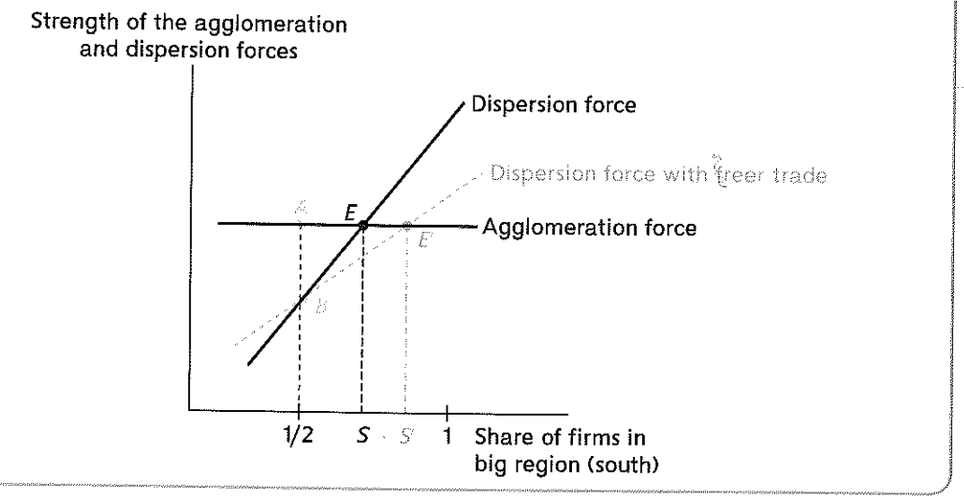
The final simplifying assumption is that we ignore the circular causality in the demand-linked agglomeration force. One way to think of this is by supposing that workers spend all their income in their native region regardless of where they work. Thus the south market starts out bigger, but firms moving to the south does not make the market bigger.

To study the balance of the agglomeration and dispersion forces, it helps to have a simple diagram. Figure 10.9 serves this purpose. The diagram plots the strength of agglomeration and dispersion forces on the vertical axis. The horizontal axis plots the share of all firms that are located in the big region, i.e. the south. Thus:

- The 'agglomeration force' line is flat since we assume away circular causality for simplicity's sake. The market-size difference does not vary with the share of firms in the south, so the strength of the agglomeration force as we move out along the agglomeration force line does not change.

- The 'dispersion force' line is rising since the benefit of staying in the small region rises as more firms move to the southern market. To understand the positive slope, note that the difference between the degree of local competition in the north and in the south increases as a higher share of firms move to the south. For example, suppose there were only four firms. When they are split 2–2 between the regions, the local competition is even. When they are split 3–1, the local competition is more intense in the region with three firms (the south). Finally, if the split is 4–0, then the difference in local competition is even greater. Connecting these observations, we see that the dispersion force (i.e. the attractiveness of the small market) rises as the share of firms in the south rises. Graphically, this means that the 'dispersion force' curve is upward-sloping.

Figure 10.9 Agglomeration and dispersion forces in a simple diagram



The locational equilibrium is shown by point *E*; this is where the share of firms in the south rises to ne point where incentives to agglomerate are just balanced by incentives to disperse. It is instructive to onsider why other points are not the equilibrium. For example, consider the point where half the firms re in the north. For this equal distribution of firms, the strength of the agglomeration force is shown by oint *A*; the strength of the dispersion force is shown by point *B*. Because *A* is greater than *B*, we know that ne agglomeration force – i.e. the force leading more firms to move to the south – is stronger than the spersion force – i.e. the force leading firms to move to the north. As a consequence, having only half ne firms in the south cannot be an equilibrium. Moreover, since the agglomeration force is stronger than ne dispersion force, some firms will move from the small north to the big south.

As firms move southward, the gap between the agglomeration force and the dispersion force narrows. ne location equilibrium is where the two forces just offset each other, namely, point *E*, where the share f firms in the south is *S*. Although it is not shown in the diagram, readers can easily convince themselves at points to the right of point *E* involve a situation where the dispersion forces are larger than the gglomeration forces so the share of firms in the big region would tend to fall back to point *E*.

ne location effects of tighter European integration

nally, we come to the main subject of this section: How does tighter economic integration affect the cation of industry inside a nation? We think of greater economic integration as lowering shipping osts. Note that here we are speaking of the trade costs among regions within a nation. Such cost ductions come with improvements in technology and improvements in transportation infrastructure nd competition. All of these are fostered directly and indirectly by various elements of European

integration. This is especially true for EU regional spending on roads, airports, seaports – the sort of thing we discuss below. It is worth noting, however, that such within-nation integration would proceed even without European integration. For the purposes of the diagram, we do not care about the exact reason trade costs are falling; we simply assume they do fall and trace out the impact on the spatial dispersion of firms.

How do we show the trade cost reduction in the diagram? The first point is that the agglomeration force line does not move. The agglomeration force is based on the fact that the northern market is bigger and this fact does not change when trade becomes freer. Nothing happens to the 'agglomeration force' line.

Freer trade, however, has a very direct effect on the 'dispersion force' curve. The source of the dispersion force is that trade costs protect firms located in the small market from competition from firms located in the big market. It is clear, then, that something will happen to the dispersion force line. To get a handle on this, consider a very particular point on the line, the point where the share of firms in the big region is ½. At this point, the level of trade costs has no influence on the relative attractiveness of the two regions. Whether trade costs are high or low, the degree of local competition in the two markets will be identical. The thrust of this is that the dispersion force line must always pass through point *B* in the diagram. Any change will be a rotation of the line around point *B*.

For points to the right, the dispersion force line must come down. The reason is that, with more firms in the south than the north, the advantage of being in the low-competition north (low competition since there are fewer firms there) is reduced by lower trade costs. In other words, the lower trade costs provide less protection against competition from south-based firms. For this reason, the local competition advantages of being in the north are reduced. Since this is true for all points to the right of ½, this shows up graphically as a clockwise rotation of the 'dispersion force' line around the ½ point.

Given that the dispersion-force curve rotates clockwise and the agglomeration-force curve stays put, the new locational equilibrium is at point *E'*. Note that this involves a higher share of firms in the big region. In other words, free trade promotes the agglomeration of economic activity in the initially big region. As we saw in Figure 10.2, this within-nation concentration of economic activity is a widespread phenomenon in Europe.

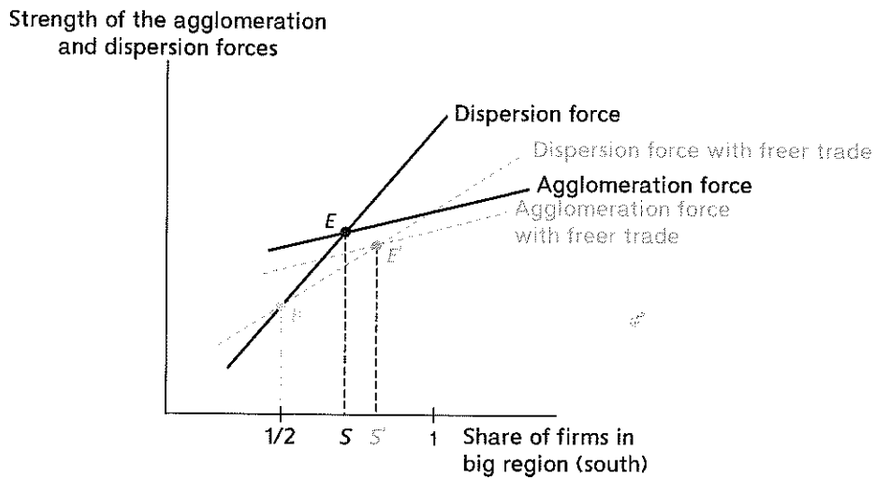
The simplifying assumptions above made it very easy to study integration's impact on the location of economic activity in Figure 10.9. While it assumed away many important factors affecting the location of economic activity, it is sufficient for understanding the basic economic logic of how tighter European integration can be expected to favour the location of industry in Europe's core regions. Some readers, however, will want to explore the economics of this in greater depth. Box 10.2 shows how some factors can be included in a modified version of Figure 10.9.

Box 10.2 Considering additional complicating factors

As it turns out, it is not very difficult to add back in a number of complicating factors that we assumed away to start with.

For example, we can easily allow for circular causality in the agglomeration force. We do this by drawing the agglomeration-force line as upward-sloping (Figure 10.10). If the line slopes upward, it says that the strength of the agglomeration force rises as a larger share of firms move to the big southern region. This addition raises an extra complication concerning the impact of freer trade. Freer trade rotates the dispersion-force line as in the text; however, now it also reduces the agglomeration force for any level of firms in the north. The reason is clear; the agglomeration force stemmed from the fact that locating in the big market helps a firm reduce its shipping costs. Since lower overall shipping costs narrow this difference between the markets, the agglomeration-force line shifts down. The complication is that there is now a graphical possibility that the new *E'* will be to the left of the old *E*. A careful study of the logic shows that this cannot occur. Roughly speaking, the free trade reduces the agglomeration forces by less than the dispersion forces so the new location equilibrium involves more spatial concentration.

Figure 10.10 Allowing for circular causality



We can consider other dispersion forces by shifting the dispersion-force curve up or twisting it at the ends. For dispersion forces that are not related to the share of firms in the north, the dispersion-force curve is shifted up vertically. For example, it could be that one region is intrinsically more pleasant to live in. Since the impact of this on location does not depend upon the share of firms in the south, we allow for such forces by shifting the curve either up or down. Interested readers can easily check that a downward shift will increase the equilibrium share of firms in the south. Other dispersion forces, however, are related to the share of firms. For example, the concentration of firms in southern England drives up the wages of workers in this region. Other things equal, this acts as a dispersion force in that it discourages some firms from moving to the south. We can reflect this in the diagram by rotating the dispersion-force line counter-clockwise around the ½ point.

10.4 Theory part III: putting it all together

The facts presented above showed that European integration was accompanied by location effects within nations that are quite different from those between nations. European integration seems to be associated with a more even dispersion of economic activity in the sense that per-capita GDP figures tended to converge nation by nation. Within nations, however, the opposite has happened. In most Member States, regional disparities have grown as European integration has deepened. The theory presented above helps us to understand the difference. The key factor is the mobility of capital and labour.

While there are few remaining restrictions on intra-EU labour flows, workers seldom move across national borders in the EU. Labour mobility between regions within a nation is higher, but still not enormous – as we can see with the huge variation in regional unemployment rates. However, labour mobility has not always been low within nations. The post-war period, for example, saw a massive shift of the population from rural to urban regions and this often involved a move across regional boundaries. Moreover, other productive factors are more mobile; for example, capital and skilled workers are quite mobile between regions within the same nation.

Oversimplifying to make the point, think of all factors as perfectly mobile within nations, but perfectly immobile across nations. In this case, removing barriers to trade allows nations to specialize in the sectors in which they have a comparative advantage. The resulting efficiency gain allows all nations to increase their output. Moreover, deeper aspects of integration, such as foreign direct investment and mobility of students, suggest that European integration would also be accompanied by a convergence of national technology frontiers to the best practice in Europe, with the technological laggards catching up with the technological leaders. Both of these factors would promote a convergence of per-capita incomes across European nations. Importantly, the lack of factor mobility across nations means that agglomeration forces are not dominant at the national level. That is to say, the cycles of circular causality that might lead all economic activity to leave a region have no chance of starting. This conclusion must be modified to allow for sector-specific clusters. Even if productive factors do not move across national boundaries, agglomeration forces operating at the sectoral level could result in nations specializing in particular industries. For example, deeper integration could foster greater geographic clustering of, say, the chemicals industry and the car industry, but in the end each nation ends up with some industry.

By contrast, the much greater mobility of factors within nations permits backward and forward linkages to operate. As one region grows, it becomes attractive to firms for both demand and cost reasons, so more firms and more factors move to the region, thereby fuelling further growth.

10.4.1 Regional unemployment

The analysis so far has assumed that wages are flexible enough to ensure full employment of all labour. Since regional unemployment is a serious problem in Europe, we turn to the economic logic connecting delocation and unemployment. As usual, we follow the principle of progressive complexity by starting simple.

If wages were adjusted instantaneously across time and space, we would have no unemployment. The wage rate paid for each hour of work would adjust so that the amount of labour that workers would like to supply at that price just matched the amount that firms would like to 'buy' (hire). In this hypothetical world, the wages would instantaneously jump to the market-clearing level, i.e. the level where labour supply matches labour demand. Things are not that simple, however.

For many reasons, most European nations have decided to prevent the wage – the 'price' of labour – from jumping around like the price of crude oil or government bonds. (See Chapter 8 for a more formal treatment of unemployment.) All sorts of labour market institutions, ranging from trade unions and unemployment benefits to minimum wages and employment protection legislation, mean that the price of labour is systematically stabilized at a level that exceeds the market-clearing wage level. The direct logical consequence is that workers systematically want to offer more labour at the going wage than firms are willing to hire; this is the definition of unemployment. As in any market, if the price is fixed too high, the amount offered for sale will exceed the amount that is bought.

In most European nations, there is a strong spatial element to this price-fixing of labour. Take Germany, for example. For many reasons, labour productivity in the eastern Länder is lower than it is in the western Länder. Thus, firms would only be willing to employ all the eastern labour offered if wages were lower in the east. However, German labour unions have methodically prevented eastern wages from falling to their market-clearing level, either in an attempt to avoid downward pressure on their own wages or, more charitably, in the spirit of solidarity with the eastern workers who actually do get employed. Whatever the source of regional wage inflexibility, its logical consequence is regional unemployment. Moreover, since firms can leave a region much more easily than workers, a continual within-nation clustering of economic activity will tend to be associated with high levels of unemployment in the contracting regions and low levels in the expanding regions.

Finally, it should be clear that this sort of mismatch of migration speeds (firms move faster than workers) – teamed with a lack of regional wage flexibility – has the effect of creating an agglomeration force. A little shift of industry raises unemployment in the contracting region and lowers it in the expanding region. Since unemployment is an important factor in workers' migration decisions, the initial shift makes workers more likely to migrate to the expanding region. Such migration, however, changes the relative market sizes in a way that tends to encourage more firms to leave the contracting region. (For a detailed account of geographical clustering of unemployment in Europe, see Overman and Puga, 2001).

10.4.2 Peripherality and real geography

Our theoretical discussion has intentionally simplified physical geography considerations by working with only two nations, both of which are thought of as points in space. Real-world geography, of course, is

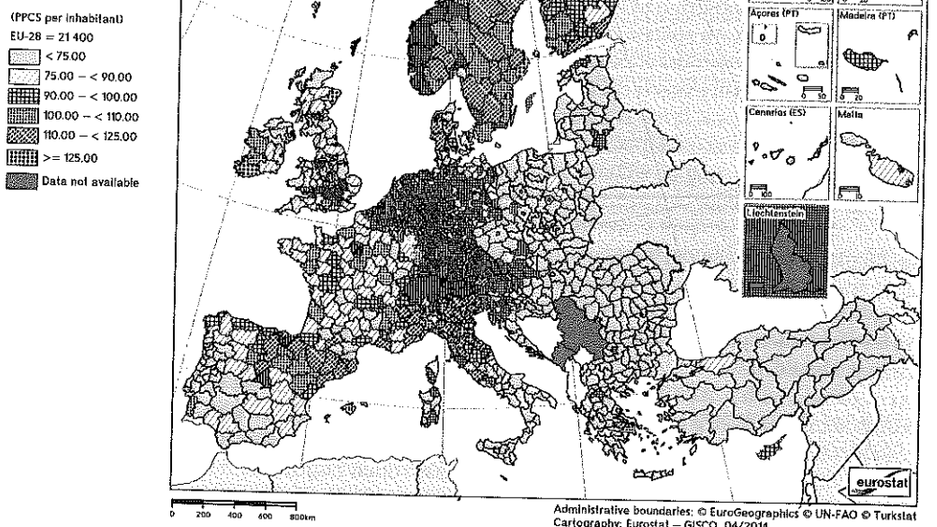
much more interesting and this matters for the location of economic activity. We can use the basic logic of demand-linked agglomeration forces to consider how one can put real geography back into the picture.

As discussed above, firms that want to concentrate production in a single location tend, other things being equal, to locate in a place that minimizes transportation costs. With only two markets, this means locating in the bigger market, but when the economic activity is spread out over real geography, the answer can be less obvious. However, the fact that economic activity is highly concentrated in Europe makes the problem easier. As the map in Figure 10.2 showed, the core of Europe is fairly compact from a geographical point of view, i.e. it is concentrated in the northeast corner of the continent. This is why it is useful to abstract Europe's geography as consisting of two regions, the core and the periphery, what we called the north and the south in the previous section.

There are many complicating factors, however. For example, despite the Alps forming a wall between northern Italy and the big French, German and UK markets, northern Italy has quite good road access thanks to several tunnels and passes through the mountains.

Economists have a way of taking account of the various real-geography features, known as the accessibility index (also called the market potential index); see Figure 10.11 for a recent example. The

Figure 10.11 Real geography and market accessibility



(1) Turkey: by NUTS 2 regions. Iceland and Switzerland: national level. Guadeloupe (FR91), Martinique (FR92), Guyane (FR93), and Réunion (FR94): estimates.
Source: Eurostat (online data code: nama_r_e3gdp and nama_r_e3popgdp)

Note: The map is scaled such that 100 equals the average accessibility in the EU27.

Source: © European Union, 1995–2012

accessibility index for each region measures the region's closeness to other regions that have a lot of economic activity. For example, to calculate the accessibility of the region that contains Paris, the Ile de France, one calculates how long it would take to get from the centre of Paris to the main urban centre of every other region in the EU (the calculation varies somewhat according to the form of transport used; the map here works with road transportation). Finally, one weights each of these transport times by the destination region's share of the EU's total economic activity. Adding up these weighted times gives us an idea of how close Paris is to the bulk of EU economic activity. Doing the same for every other region gives us an index of accessibility by region.

10.5 EU regional policy

Most Europeans care about disadvantaged regions as part of their general preference for social cohesion. Indeed, reducing regional inequality has been a headline goal of the European Union since its inception in the later 1950s and this was reaffirmed in the Lisbon Treaty. Article 174 of the Treaty of Lisbon states:

> *In order to promote its overall harmonious development, the Union shall develop and pursue its actions leading to the strengthening of its economic, social and territorial cohesion. In particular, the Union shall aim at reducing disparities between the levels of development of the various regions and the backwardness of the least favoured regions.*

This section reviews the main aspects of EU regional policy, which has developed gradually over the last six decades. See Her Majesty's Government (2014) for a succinct history of EU cohesion policy, which is here taken as a synonym for regional policy.

10.5.1 Instruments, objectives and guiding principles

In its latest long-term budget plan, the so-called Multiannual Financial Framework for 2014–2020, the EU is committed to spending a third of its budget on cohesion policy. How is this money allocated? Here, we just touch upon the main points. Interested readers can find well-written documentation of the full details at http://ec.europa.eu/regional_policy/index_en.htm.

The guiding light for cohesion spending in the period 2014–20 will be the 'Europe 2020 Strategy' for 'smart, sustainable and inclusive growth'. This 10-year strategy was introduced by the European Commission in 2010 with the explicit goal of overcoming the global and Eurozone crises. It has 11 thematic objectives – 3 under smart growth, 4 under sustainable growth and 4 under inclusive growth (see Table 10.2). EU nations negotiate partnership agreements ('Operational Programmes') with the European Commission on how they will use EU funds to help deliver the Europe 2020 strategy.

The new cohesion policy for 2014–20 will involve thousands of projects. These will range from improving transport and telecommunication links with remote regions, helping small and medium-sized enterprises in disadvantaged regions, cleaning up the environment, and improving education attainment and skill levels.

Every region in the EU is eligible for cohesion spending of one type or another, but the bulk of the money, about 80 per cent, goes to poor regions. Specifically, about two-thirds goes to regions whose incomes are less than 75 per cent of the EU27 average – the so-called less developed regions. Another 13 per cent goes to 'transition' regions whose incomes are between 75 and 90 per cent of the EU27 average. The remaining 20 per cent can be spent in all other regions, i.e. those with incomes above 90 per cent. Something like 3 per cent of the money is earmarked for cross-region projects that reduce the negative effects of borders. This 'European Territorial Cooperation' helps regions work together to address common problems such as pollution in the Baltic Sea and cross-border use of hospitals.

10.5.2 Allocation by Member State

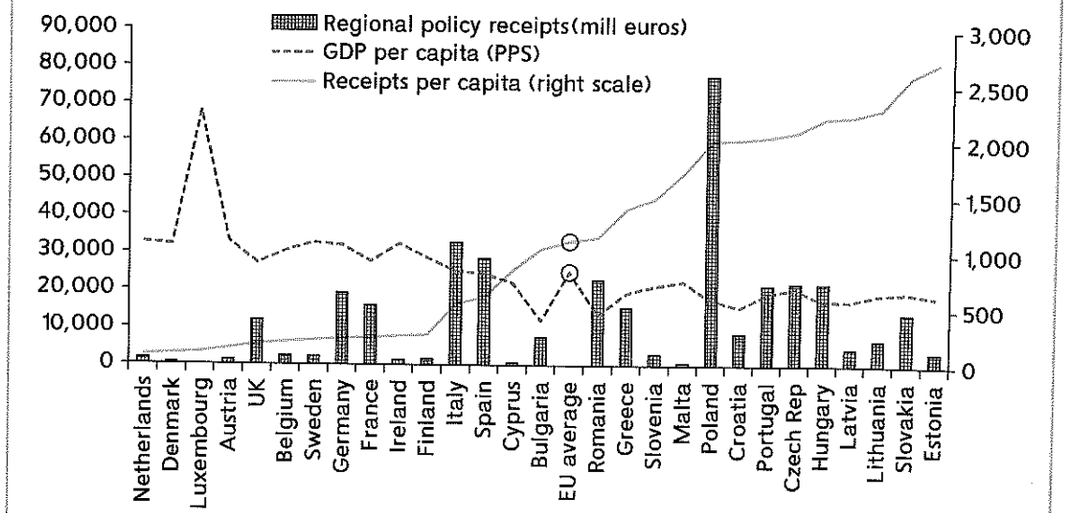
Spending per nation is set down in the Multiannual Financial Framework for 2014–2020. As Figure 10.12 shows, a rough negative correlation exists between high receipts per capita and high incomes. Estonians get the highest receipts, at €2,700, while the Dutch get the least, at just €84 per capita spread over the seven years.

Table 10.2 Thematic objectives in the Europe 2020 strategy

	Smart growth
1	Strengthening research, technological development and innovation
2	Enhancing access to, and use and quality of, information and communication technologies
3	Enhancing the competitiveness of small and medium-sized enterprises (SMEs)
	Sustainable growth
4	Supporting the shift towards a low-carbon economy in all sectors
5	Promoting climate change adaptation, risk prevention and management
6	Preserving and protecting the environment, and promoting resource efficiency
7	Promoting sustainable transport and removing bottlenecks in key network infrastructures
	Inclusive growth
8	Promoting employment and supporting labour mobility
9	Promoting social inclusion, combating poverty and countering discrimination
10	Investing in education, skills and lifelong learning
11	Enhancing institutional capacity of public authorities and stakeholders, and promoting efficient public administration

As far as total national receipts are concerned, Poland is the standout. Poland will get an astounding 22 per cent of the total spending, which is more than the combined receipts of the next two higher recipients (Spain and Italy).

Figure 10.12 Allocation of cohesion spending by nation, 2014–2020



Source: Multiannual Financial Framework and Eurostat for population and income data

The many structural funds

For historical reasons, most EU cohesion spending is channelled through three 'funds': two 'structural funds' and the 'cohesion fund'. The CAP's second pillar (rural development; see Chapter 9 for details) is run separately but is supposed to be in synch with the Europe 2020 growth strategy. Although there are three funds, they are subsumed in an overall strategy, so the details of the funds are only important for experts.

10.6 Empirical evidence

The chapter has stressed three main determinants of the location of economic activity: regional policy and two purely economic determinants (comparative advantage and agglomeration). We now consider the importance of these three forces.

To evaluate the determinants of industrial location in the EU, researchers try to explain how regional and national shares of various types of manufacturing vary with regional and national characteristics, where it is useful to divide the national characteristics into three broad groups: relative labour supplies, economic geography features, and policies affecting industrial location.

For instance, the theory section explained why we should expect nations that have a relatively high share of the EU's skilled labour also to have a relatively high share of the EU's manufacturing sectors that are relatively intensive in their use of skilled labour. The same link should be expected for relative endowments of other types of labour – low-skilled and medium-skilled workers – and sectors that use these types of labour intensively as well as regional endowments of agricultural land and industries that use agricultural inputs intensively.

The theory section also explained that the spatial allocation of demand affects the location of industry since sectors where firms tend to concentrate production in a single location (i.e. those marked by important economies of scale) will tend to favour locations that are near large markets. This so-called demand linkage (firms want to be near the demand for their goods) is complemented by so-called supply linkage – that is, firms in sectors that use lots of intermediate inputs will tend to favour locations with concentrations of their suppliers.

Finally, policy can directly encourage the location of particular types of sector in particular locations and this effect can either amplify or dampen the impact of factor endowments and economic geography factors on the location of industry. Although the research in this area is limited – mainly owing to a lack of data on the location of manufacturing and regional labour endowments – the results so far suggest that all three factors matter. Interestingly, it seems that labour endowments have become more important in determining location as European economic integration has become tighter. One of the two agglomeration forces – namely, supply linkages – seems to be getting stronger, while the demand linkage is getting weaker (see Redding, 2010).

Given that EU regional policy has been operating at a significant level only since the mid-1980s, results on the impact of policy are even more tenuous. The best study in this area, Midelfart-Knarvik et al. (2002), finds that EU policy has significantly affected the geographical location of industries. In particular, these authors find that EU structural spending did affect the location of high-skilled intensive industries. For an integrated survey of the empirical evidence, see Combes and Overman (2004).

10.7 Summary

Europe's economic activity is highly concentrated geographically at the national level as well as within nations. This is a problem for social cohesion since people located in the 'core' enjoy higher incomes and lower unemployment rates. European integration seems to have led to a narrowing of income equality across nations, but an increase in inequality within nations. Nevertheless, European integration has been accompanied by only modest relocation of industry among nations, but the little movement we have seen has been in the direction of manufacturing activities having become more geographically dispersed, not less, while most European nations have become more specialized on a sector-by-sector basis.

The chapter presented two main theories that could account for these facts. The first – the comparative advantage framework – explains why nations have become more specialized while at the same time income

differences have narrowed. The second – based on the so-called new economic geography – focuses on agglomeration forces that account for the way in which tighter economic integration can foster the clustering of economic activities within nations.

The chapter also presented the main outlines of the EU's regional policy. The goal of this policy is to help to disperse economic activity to less-favoured regions. Most of the money is spent on so-called convergence regions that typically have per-capita incomes that are less than 75 per cent of the EU average. The EU spends about a third of its budget on these policies.

Self-assessment questions

1 Draw a diagram with the extensions to the agglomeration diagram suggested in Box 10.2.
2 Download the European Commission's proposal for reforming structural spending and compare it to the principles of the system in place up to the end of 2006.
3 The educational level in all EU nations is rising. How would this affect the spatial allocation of production in the Heckscher–Ohlin framework?

Further reading: the aficionado's corner

For a more extensive discussion of the facts concerning changes in the location of economic activity in the EU, see:

Brülhart, M. and R. Traeger (2003) *An Account of Geographic Concentration Patterns in Europe*, Cahiers de Recherches Economiques du Département d'Econométrie et d'Economie Politique (DEEP), Université de Lausanne. Download from www.hec.unil.ch/deep/publications-english/e-cahiers.htm.

Each year, the Commission produces a report on 'cohesion' in the EU. This contains a large number of maps showing things such as unemployment, declining population, and share of the economy in agriculture, industry and services. It also presents a large number of indicators of social cohesion, such as youth unemployment and income distribution. See:

European Commission (2001) Second Report on Economic and Social Cohesion. http://ec.europa.eu/regional_policy/sources/docoffic/official/reports/contentpdf_en.htm.

For an advanced treatment of the new economic geography, see Part I of:

Baldwin, R., R. Forslid, P. Martin, G. Ottaviano and F. Robert-Nicoud (2003) *Economic Geography and Public Policy*, Princeton University Press, Princeton, NJ.

Useful websites

The European Parliament's factsheets provide a wealth of information on EU regional policy. See: http://www.europarl.europa.eu/aboutparliament/en/displayFtu.html?ftuId=theme5.html.

The Commission department devoted to regional policy (DG Regio) has an extensive website that provides masses of data and several highly readable explanations of EU policy in the area. There is also a very handy facility to display regional data on maps. See http://ec.europa.eu/regional_policy/index_en.cfm.

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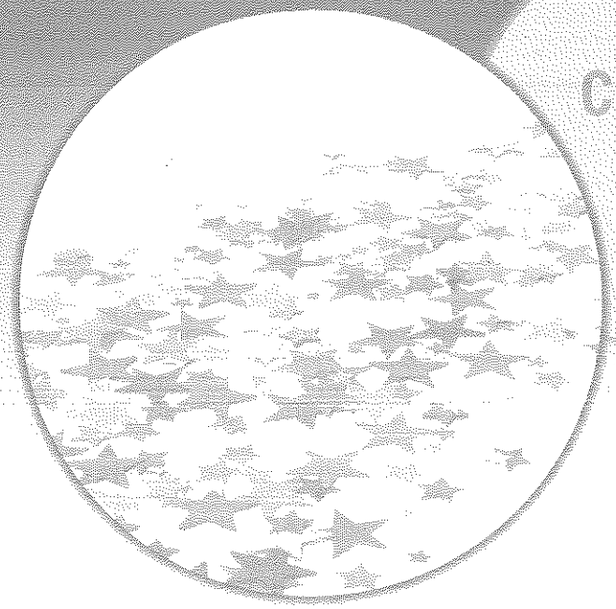

Chapter

Keeping markets open to new entrants is a key factor for the promotion of innovation. When monopolies and tight oligopolies are allowed to occupy a market, they tend to resist change and often end up caring only about the preservation of their business models. Contestable markets, instead, allow new players to experiment, and new ideas to succeed. It is a major task of competition control to ensure that new generations of businesses are given a fair chance.

Joaquín Almunia, Vice President of the European Commission responsible for Competition Policy, 10 February 2012

EU competition and state aid policy

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