COMBINED AND UNEVEN DEVELOPMENT:
REFLECTIONS ON THE NORTH-SOUTH DIVIDE

by

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Abstract

This paper is concerned with the geography of structural change in Great Britain since 1971. It divides the country into two broad areas – the 'North' comprising Northern England, the West Midlands, Wales and Scotland, and the 'South' comprising the rest of mainland Britain. The paper documents the uneven regional impact of industrial decline and the rise of the new service economy. The North has experienced the greatest industrial decline and has gained least from the growth of new service industries. With certain local exceptions, the apparent revival of the Northern economy in recent years is not based on self-sustaining growth but on public sector and related employment financed by fiscal transfers from the more dynamic South. Such transfers have disguised but have not eliminated the old North-South divide.

Combined and Uneven Development:
Reflections on the North-South Divide[1]

Introduction

This paper is concerned with the geography of structural change in the United Kingdom. It is primarily concerned with Great Britain, although some information is also provided about Northern Ireland. The analysis is at a highly aggregated level. The geographical units considered consist of standard regions which have an average population of five million and are grouped into two broad areas, North and South, with populations of 25-30 million. This is by no means the only possible, or even the best, approach to the issue of geography and structural change. It would have been equally valuable to focus on cities and their economic evolution, or on differences within the standard regions[2]. I have chosen to focus on standard regions and the North-South divide for two reasons. Firstly, data on the standard regions are readily available and it is a simple matter to aggregate them into the broad categories of North and South. Secondly, aggregation into these broad categories is useful because it allows us to focus on an important development in recent decades, namely the gradual shift in population and economic activity towards the southern part of the country

Employment and Demography

Great Britain is conventionally divided into two geographical areas - the North and the South. The dividing line between the two areas runs roughly from the River Severn to the Wash. In terms of standard regions, the South comprises Greater London, the South East, the South West, the East Midlands and the East. The North comprises the rest of mainland Britain including Scotland and Wales. The economic structure of the two areas is different and their economic performance has been different. Although both areas have failing and successful parts, the South as a whole has been more dynamic than the North in recent decades. It has suffered less from the decline of manufacturing and mining employment, and it has gained a disproportionate share of the new jobs in such dynamic areas as financial and business services. The two areas cannot be considered in isolation from each other because they are linked through numerous different channels, such as trade, investment, government transfers and migration. Taken together, the North and the South form a system which exemplifies what the Russian author Leon Trotsky called "combined and uneven development".

Total employment in the North reached an all-time peak of 12.8 million in 1979. It then fell sharply in the industrial slump of the early Thatcher years. This was followed by a slow and irregular recovery, and by the turn of the century the number of people employed in the North was still slightly below the level achieved in 1979 (Chart 1). Over the same period, almost two and a half million extra jobs were created in the South, where the industrial slump was less severe and the subsequent recovery was much stronger. The contrasting employment experience in the two areas is mirrored in the behaviour of migration and population. For almost three decades net migration into the South has been positive and on a strongly upward trend. At first, the incomers came mainly from elsewhere in Britain, but in recent years this type of has become less important. Net emigration from the North has tailed off and it is foreign countries that now provide the source of net immigration into the South (Chart 2).

These migration flows are reflected in the figures for population, which has been stationary in the North, but increasing strongly in the South under the impact of migration. Most of the international migrants have gone to London, but many locals have responded to this inflow by leaving the capital and moving to surrounding areas (Charts 3 and 4). As a result, inward migration from abroad has had a ripple effect which has spread outside London to other parts of the South. Indeed, the ripple effects of immigration have spread further still, since the rising pressure of population on housing and other costs in the South, together with competition from international migrants, is now deterring Northerners from moving south[3].

Amongst its many effects, migration tends to equalize economic opportunities across regions. In a closed economy, there is typically a net flow of migrants from areas with a shortage of work to regions where jobs are more plentiful. This will tend to equalize employment rates. In an open economy, the situation is more complex because of international migration. If foreign immigration is on a large enough scale, then even the most depressed regions may experience a net inflow of migrants. However, the same principle applies. Regions with high rates of employment will typically have more inward migration than those with low rates of employment. This will tend to reduce differences between regions just as it does in a closed economy. The operation of this mechanism is clearly visible in Britain. Despite a persistently much faster pace of job creation in the South, the overall employment rate is only about 3 percentage points higher than in the North (Chart 5). Most of this gap is accounted for by unqualified workers. Amongst qualified workers, employment rates in the North and the South are mostly quite similar (Chart 6). This is not really surprising since qualified workers are a comparatively mobile group and distribute themselves

fairly evenly across the country in line with available employment opportunities. One interesting exception amongst qualified workers is the existence the low employment rates amongst qualified workers in London. This could be due to the fact that London contains a large number of qualified students, wealthy rentiers, asylum seekers, and members of ethnic minorities who do not desire to work or are disadvantaged in the labour market. For a variety of reasons such people may not wish to leave the capital and their failure to migrate inhibits the equalization of employment rates.

Obstacles to migration explain the persistence of large inter-regional differences in employment rates amongst unqualified workers. These differences are not confined merely to older workers who were the casualties of de-industrialisation, but they are also visible amongst younger workers in the age group 25-49[4]. The costs of movement for such people are often very high in comparison to potential benefits. Housing and other living costs are on average higher in the South than the North, and even in the most prosperous regions of the South there is a large surplus of unqualified workers. For an unqualified worker with a job in the North there is no incentive to migrate since real wages for such worker are no higher in the South. And for an unqualified worker without a job, the prospects of getting a secure job in the South are not very good so it is often better to sit tight and hope for the best. Such factors help to explain why younger unqualified workers are reluctant to move within the country and why migration flows do not equalize employment rates amongst such workers.

Structural Change – North and South Compared
Like other advanced economies, Britain has undergone huge structural changes over the past thirty years. Agriculture has continued to decline as a source of employment, mining has almost disappeared, and the number of people working in manufacturing has fallen by more than 50 percent. At the same time, there has been a rapid growth of employment in a wide range of service activities, ranging from financial and business services to health and education. These developments have occurred in all advanced economies, although in few of them has the transformation been so extreme. In no advanced economy has the manufacturing sector performed so badly in terms of output or employment as in this country, and in no advanced economy has there been such a spectacular growth of internationally traded financial and business services.

Tables 1-3 show how employment in the various regions of the UK has been affected by structural change since 1971. These tables divide economic activity into a number of broad categories. There is the market sector which consists of transportable goods (agriculture, extraction and manufacturing), financial and

business services, and other market activities. There are also government services, such health and social services, education, public administration and defence. Because of data limitations, the figures for government services include private sector employment in the relevant activities.

The most striking feature of the tables is perhaps the universal character of structural change. Every region has experienced a massive fall in the number of people producing transportable goods, and all of them have experienced a substantial rise in the number of people employed in financial and business services. With one exception they have also enjoyed a big rise in government employment. However, there are also some important differences. The decline of employment in transportable goods has been on average greater in the North than the South, in both absolute and percentage terms. This reflects the initially greater dependence of the North on mining and heavy industry. Conversely, financial and business services have grown much faster in the South, as indeed have other market activities. The combined effect of these changes is remarkable. Every northern region has experienced a reduction of employment in the market sector as a whole since 1971. With the exception of London, every southern region has experienced growth in this sector. In the South as a whole market sector employment has risen by 18.6 percent (1.9 million) since 1971, whereas in the North it has fallen by 7.8 percent (800 thousand).

The only area where the North has done better than the South is in government services. Taking the North as a whole, employment in these services grew by 68.0 percent (1288 thousand) which more than offset the decline in market sector jobs, with the result that total employment was a little higher in 2003 than it had been in 1971. The above average growth of government services in the North during this period was mainly a catching up process. In 1971, employment per head of population in all of the major government services was lower in the North than in the South, and it was only after a prolonged period of rapid growth that the gap was finally eliminated (Chart 7).

London – A Special Case
Any sweeping claims about the economic differences between North and South face a problem in the form of London, which combines features of both areas. In the 1960s, the capital was a great industrial city, with over a million people employed in manufacturing and a large number employed on the docks. Since then three-quarters of manufacturing jobs have disappeared and with the exception of Tilbury the main docks have all closed[5]. In terms of the speed and the extent of industrial decline, London is similar to the North (Chart 8). In other respects, however, London is very different. Unlike the northern regions, London has experienced a prolonged and substantial loss of jobs in public

administration. It has also developed a vast array of financial, business and creative services the over the past twenty years, and it is now the flagship of Britain's economic revival. In this respect, London belongs firmly in the South.

In aggregate terms, the employment boom in market services has just offset the long decline in industrial jobs and the loss of government employment, with the result that total employment in London is now similar to what it was thirty years ago. However, such an aggregate comparison is misleading since it ignores the differential impact of structural change on various social groups in the capital.

London has a large surplus of unqualified workers, partly as a hangover from its industrial past and partly as a result of international migration. Many of the new service industries generate little demand for this kind of labour and it is predicted that the total number of jobs for unqualified workers will decline in the future[6]. This helps to explain why there is so much unemployment and poverty in London despite its apparently glittering economic performance. The real beneficiaries of the modern service boom in London are the highly skilled workers for whom demand has mushroomed. Many of these skilled workers do not even live in the capital but commute from beyond its boundaries. What has happened in London is common when there is a great structural change. Those who gain from the growth of new industries are rarely the same people that lose from the decline of the old.

The Export Base
What do the above developments imply for the future of the so-called North-South divide? Before seeking to answer this question let first consider what geographers call the "export base" of a region. The export base consists of all those activities which bring income into the region by providing a good or service to the outside world, or provide locals with a good or service which they would otherwise have to import. The alternative term "tradables" is also used to denote such activities. Agriculture, mining and manufacturing mostly belong under this heading, as do the local producer services which these activities rely on. The export base includes services such as tourism, national or international call centres, large company headquarters and the like. All of these represent an independent source of income for the region. It also includes certain public services, such as national defence, central government services, and an increasing part of the university sector. Such public services provide something useful to outsiders in return for the money the region receives, so this income is not merely a welfare transfer from the central government. The export base

does not in general include local consumer services, such as retail distribution, nor does it include public services that are primarily aimed at the local population. Most of health, education, public administration and social services do not belong to the export base[7].

The boundary between tradable and non-tradable products is constantly shifting under the impact of economic and technological change. For example, modern communications permit the rapid exchange of information over long distances and are being used to develop new forms of inter-regional and inter-national trade in services. As a result, many services that were previously regarded as purely local in character are now traded over long distances and should be included in the export base. Likewise, innovations in transportation or in production increase the geographical range over which finished goods or components can be traded. There is also the issue of interdependence to consider. Any tradable good or service makes use of inputs that are not themselves directly tradable outside of the region and their contribution should be included in the export base. In principle, this can be done by means of an input-output table that quantifies the extent of interdependence between various activities. However, this is often impractical and cruder methods must be used to trace the boundaries of the export base.

The long-run prosperity of a region is determined primarily by the strength of its export base[8]. Consider what happens if the export base contracts through the closure of a steelworks, naval base or a bank, for example. This will cause an immediate rise in employment and total income in the region. There will be a short-run multiplier effect on employment as local suppliers lay off workers, and consumer expenditure on housing, shopping, leisure activities and the like is reduced. The scale of this short-run multiplier will be limited by the operation of the welfare state, whose expenditures in the region will help to maintain local demand following a blow to the local economy. Central government transfer payments to the newly unemployed will allow them to continue spending, albeit at a reduced rate, on local goods and services. Hospitals and schools will continue to operate as normal, providing jobs for those who work in them and supply them. In addition, redundant workers may receive compensation which allows them to continue spending in the local economy.

Thus, in the short run, there is a variety of mechanisms which limit the extent of decline following a major shrinkage in the export base. What happens in the long run depends on migration. If emigration is easy, then following the initial decline, some younger people will start to leave the region in search of better opportunities elsewhere. As they do so, the number of children living in the region will begin to fall and schools will close or lay-off staff. The demand for

medical services for younger adults and their children will also fall as people leave. And as the present generation of pensioners dies off and are not replaced because of emigration, the demand for medical and social services for the elderly will eventually shrink. All of these mean further reductions in employment. Thus, the initial decline will set in train a long-run multiplier as emigration leads to a downward spiral of shrinking population and falling employment.

In the absence of permanent obstacles to migration, the surplus population of a depressed region will tend to redistribute itself over the country until equilibrium is eventually restored, and the existing export base is sufficient to support a reduced population at the normal level of prosperity. As it stands, this argument ignores international migration. If there is large scale immigration, then even depressed areas may experience net inward migration. However, the same principle still applies. If there is a negative shock to the export base of a region, then it will attract fewer migrants than before, so its share in the national population will decline.

A North-South Comparison

To get an idea of long-run trends, I have tried to estimate what has happened to the export base of the North. Given the ambiguities involved in the concept and the limited statistics available there is no really good way of measuring the export base, but as a proxy I use the total number of people employed in agriculture, mining, manufacturing plus what I call "excess" employment in financial & business services, hotels & restaurants, public administration & defence[9]. Other ways of measuring the export base were also considered but they all lead to a broadly similar result[10].

Having estimated the export base for the North, this figure is divided by the corresponding figure for the South of the country. The resulting ratio is then expressed as the index which is shown in Chart 9. This series indicates clearly how the export base of the North has shrunk in relation to that of the South. The decline was steepest the early 1980s slump, but the index has continued falling since then and is now approximately 30 percent below its value thirty years ago. There is a brief blip in the last couple of years but this may reflect the influence of a temporary downturn in the South rather ran a true reversal of trend (Chart 10).

Chart 9 also provides information on other types of employment. The relatively fast growth of public services in the North in recent years is clear from the series labelled "government non-tradables". As mentioned above, this is primarily a catch-up effect and is likely to abate in the future. It is interesting to

note that the share of the North in private non-tradables employment is falling roughly in line with population. This is to be expected since expenditure on non-tradables is strongly influenced by the amount of disposable income in a region, which in turn is strongly influenced by the size of the population. Even people who are workless and live on government transfers or private pensions that generate a demand for non-tradable goods and services.

The share of the North in population has also fallen, but at a much slower pace than the relative export base. This lag is explained by a number of factors. The loss of jobs due to the shrinkage of the export base has been partly offset by the massive expansion of government services in the North. Much of this is a catching-up effect which will not be repeated in the future. In addition, government transfers have helped to cushion the impact of decline and to maintain demand for local goods and services. These factors help to explain why the share of the North in total employment has fallen rather slowly despite the dramatic decline of its relative export base. Finally, the normal inertial forces which deter migration have caused the population share to lag someway behind the falling employment share, although both are now on the same downward trend.

The Role of Government Expenditure
Anyone who visits the old industrial towns and cities of the North cannot fail to be struck by their recent transformation. Their centres have been cleaned up and partially rebuilt, old industrial buildings have been converted into homes and leisure facilities, and restaurants, wine bars and clubs abound. This is frequently cited as evidence of a great Northern revival. This claim should be treated with caution. There are some obvious success stories, such as Leeds, which have developed a whole range of new tradable services to replace the industrial jobs they lost some decades ago. However, the evidence presented above suggests that the North as a whole is not doing so well in terms of tradable activities.

If we look more widely at the market sector as a whole, including non-tradable goods and services, there has been some growth of employment in the North in recent years, especially in Scotland and the North West. However, the total number of jobs involved is quite small, and many of them are probably a spin-off from the massive expansion of centrally-funded government employment in the North. The scale of this expansion can be gauged from Table 4. Between 1997 and 2003, total employment in the North and the South rose by almost the same amount. However, the composition of this growth was very different. In the South, government employment accounted for only one third of all net job creation as compared to two thirds in the North. Within just six years the

8

number of people employed in the North in health, education and other public services rose 16.5 percent (450 thousand). Since most this expansion is centrally financed, it represents a massive injection of money into the area, mostly in the form of salaries. Such an injection is bound to stimulate a demand for local goods and services, and hence has a multiplier effect on local employment.

At one time, the above-average growth of public services in the North was a catch-up effect and could be justified on the grounds that per capita employment in these services was lower than in the South. However, this period is coming to an end. In the major public services, per capita employment in the North is now higher than in the South and the scope for catching up has been largely exhausted. In future, per capita employment in the northern public services will have to grow broadly in line with the national trend. Given the present state of government finances, this suggests that there will be little growth of government employment in the North in the foreseeable future. There will certainly be nothing resembling the recent explosion.

The Scale of the Problem
Given that the North will no longer benefit from above-average growth in government employment, the behaviour of total employment in that area will depend primarily on the performance of its market sector which in turn will depend on the performance of its export base. Estimates of the type which underlie Chart 9 suggest that tradables employment per head of population is currently about 20 percent greater in the South than in the North. Because of productivity differences, the gap in tradables production between the two areas is even larger.[11] Per capita output of tradable goods and services is now approximately 30 percent greater in the South than the North.

There are various ways in which the gap between North and South could be eliminated. For example, the North could strengthen its export base by increasing the number of people employed in tradable activities. Tradables employment per capita is now about 20 percent greater in the South than in the North. To eliminate this gap simply by job creation, without any change in population in the two areas, would require an increase of 20 percent in tradables employment in the North over and above any increase achieved in the South. It would involve the creation of around 600,000 jobs in the northern tradables sector in addition to any extra jobs needed to keep up with tradables growth in the South. This would be an ambitious target, although it is not beyond the bounds of possibility. Congestion and rising costs in the South might eventually start to outweigh the agglomeration advantages of locating in that area and cause the locus of business expansion to shift northwards. The

strength and timing of such a shift would depend on the extent to which future growth in the South is facilitated by government policy towards industrial location, transport and housing, and the extent to which active measures are used to promote business expansion in the North. Present policies favour southern growth and so long as they continue it is will be difficult for the North to catch up. With a more restrictive policy towards southern growth and active policies to promote northern growth, it is conceivable that the above jobs target could be achieved within a reasonable time span.

Alternatively, the gap could be eliminated by reducing the share of the North in national population through differential birth and death rates or through migration. Let us consider migration. Tradeables employment is around 20 percent greater per head of population in the South than the North. Suppose the objective is to eliminate this gap entirely by means of internal migration, without any change in the relative size of the tradables employment in in the two areas. This would require the net transfer of approximately 2.5 million people from North to South. To eliminate the gap by foreign immigration alone would require a net inflow into the South of 6 million from other countries.

These estimates are very crude but it is doubtful if they could be significantly improved using the regional data that are currently available. Despite their defects, they give a good idea of the imbalance which has been concealed by the rapid expansion of government expenditure in the North[12]. Large changes in relative population would be required merely to catch up with the shrinkage of the northern export base which has already occurred. Since the northern export base is still shrinking in relative terms, the ultimate scale of migration required to restore balance could be much greater than the above estimates imply.

One indication that the gap between North and South may continue to widen is provided by the example of contact centres (call centres, help desks etc). Some years ago the government made a big and successful effort to attract contact centres to the North to fill some of the gap left by the collapse of industrial employment. As result, there are now 290,000 people directly employed as contact centre "agents" in the North, answering queries and approaching actual and potential customers. In addition there are 160,000 others working in these centres in ancilliary occupations. This amounts to almost 3.7 percent of total employment in the North, 22 percent of current employment in the area's financial and business services, and a remarkable 41 percent of the increase in employment in financial and business services that has occurred in the North since 1971. A majority of these jobs are in large call centres which handle routine enquiries and formal qualifications are not very important (Chart 11)[13].

According to a recent government report (DTI 2003), such call centres are vulnerable to offshoring and the expectation is that many of the jobs will move to cheaper locations abroad, such as India and the Phillippines where wages are 10-15% of what a call centre agent receives in Britain . So far the number of contact centre places offshored is small, but the potential is very large.

The DTI report projects that the number of people employed in contact centres in Britain will continue to increase, although at a slower rate than the past. However, given the potential for offshoring and also automation of the more basic tasks, this projection should be treated with caution. Even if total employment in contact centres does rise, the loss of the basic, large-scale centres would be a serious loss to the old industrial cities of the North where most of them are located.

Another factor to consider is the feedback from migration to the export base. An area with a dynamic export base will attract migrants from elsewhere. This will increase the size of the local labour force and may stimulate further expansion of the export base. If there are significant agglomeration economies, the result will be a cumulative process in which economic growth stimulates immigration which in turn stimulates further growth and so on indefinitely. Such expansion may continue indefinitely until it is ultimately checked by congestion or zoning restrictions. The relevance of this in the British context is obvious. Two of the most important obstacles to economic growth in the South are the transport infrastructure and zoning restrictions on housing and business development. If such obstacles were removed, there would be the potential for massive growth in employment and population in the South. Given the dynamism of the South and the apparent existence of agglomeration economies, the result could be a cumulative spiral of economic growth and inward migration, mostly from abroad, leading to an ever larger and more crowded southern population. Such an outcome would not be in the interest of most existing southerners but it is certainly conceivable.

Concluding Remarks
This paper has described the major structural shifts which have occurred in the British economy and how they have influenced the pattern of migration, both nationally and internationally. It has documented how the relative decline of the North has been masked by the massive expansion of government expenditure in this area. Such an expansion will not be repeated and future job creation in the North will depend primarily on what happens in the northern market sector, above all in the export base that produces tradable goods and services. The share of the North in tradables employment and production has been falling for some decades and this trend look set to continue. As the economic weight of

the North declines its share of the national population will also decline, probably by a considerable amount. What happens to the absolute level of the northern population will depend on the scale of international migration. If there is large-scale immigration into the UK, the share of the North in national population may decline simply because most of the immigrants go to the South. In this case, there may be no net internal migration from North to South. Alternatively, if there is a highly restrictive immigration policy, there may be a resumption of net migration from North to South. Either way, the result will be a large, migration-driven increase of population in the South. Such demographic changes are likely to prove unpopular and they may eventually provoke a political reaction and renewed efforts to rebalance economic development in favour of the North. Indeed, this is already starting to happen as regional policy moves up the government economic agenda.

Notes

[1] This is in updated and extended version of part of my Kalecki Memorial Lecture in Oxford (Rowthorn, 2000). I am grateful to Graham Gudgin of Regional Forecasting for the use of his firm's database and for his advice on some of the issues considered in this paper, to Anne Green of Warwick University for the data used for Chart 6, also to Andrew Dennis, Andrew Glyn and Stephen Fothergill for their help.

[2] The role of cities is considered briefly in Rowthorn (2000).

[3] See Hatton and Tani (2003) for an econometric analysis of the impact of immigration from abroad on internal migration within the UK. They find that, other things being equal, net migration from abroad into a region leads to net outward migration from the region by nationals.

[4] This point is brought out clearly in Figure 9 of Erdem and Glyn (2001). Their article contains a detailed discussion of inter-regional differences in employment rates.

[5] Note that employment on the docks is included under "other market activities" in tables 1-3.

[6] Prime Minister's Strategy Report (2003), Part 1, p27.

[7] For a discussion of what constitutes a tradable service see Begg (1993). This issue is examined at greater length in the appendix to this article.

[8] The appendix contains a simple mathematical model of how the export base influences regional development.

[9] "Excess" employment in industry w is defined as follows. Assume that *per capita* employment in the non-tradables segment of this industry is the same in all regions. For region i, denote population by P_i and let F_{wi} be the number of people employed in industry w. Let that k be that region of Great Britain for which F_w/P is lowest in the relevant year. Suppose that *per capita* employment in the non-tradables segment of industry w in region k is equal to $\lambda_{wk} F_{wk}/P_k$ where $\lambda_{wk} < 1$. Since *per capita* employment in this segment is the same in all regions, it follows that the absolute number of people producing non-tradables in industry w in region i is equal to $\lambda_{wk} F_{wk}/P_k \times P_i$. Hence tradables employment in industry w in this region equal $F_{wi} - \lambda_{wk} F_{wk}/P_k \times P_i$. Throughout this paper it is assumed that $\lambda_{wk} = 0.8$. Other values λ_{wk} were tried and other ways of estimating employment in tradable services were explored, but the final results were similar to those reported in the text.

[10] For example suppose that the export base is assumed to exclude restaurants, hotels, public administration and defence. Then relative employment in the Northern export base declines by 35.7 % between 1971and 2002 as compared to 29.7% using the wider measure described in the text.

[11] Depending on the sector concerned, gross value-added person employed was between 8 and 15 percent greater in the South than in the North in the year 2000. This is the latest year for which statistics are currently available

[12] These estimates are based on the assumption that only "excess" employment, as we define it, in financial and business services is part of the export base. If all financial and business services are included in the export base, then per capita employment in the tradables sector is 15 percent lower in the North than the South. To eliminate this gap through internal migration alone would require the transfer of almost 2.3 million people from North to South. If adjustment is through international migration alone, a net addition of around 5.2 million to the southern population is required.   Thus, the numbers are moderately sensitive to the exact definition of what constitutes a tradable activity, but the general picture is the same.

[13] The numbers for workers employed in each size category are derived from the statistics on agent positions as given in DTI (2003), table 10. In accordance with the procedure elsewhere in the DTI report it is assumed that the ratio of workers employed to agent positions is equal to 1.6.

Charts and Tables

Chart 1
Working Age Population and Total Employment: 1971 - 2003

Source: Regional Forecasts database
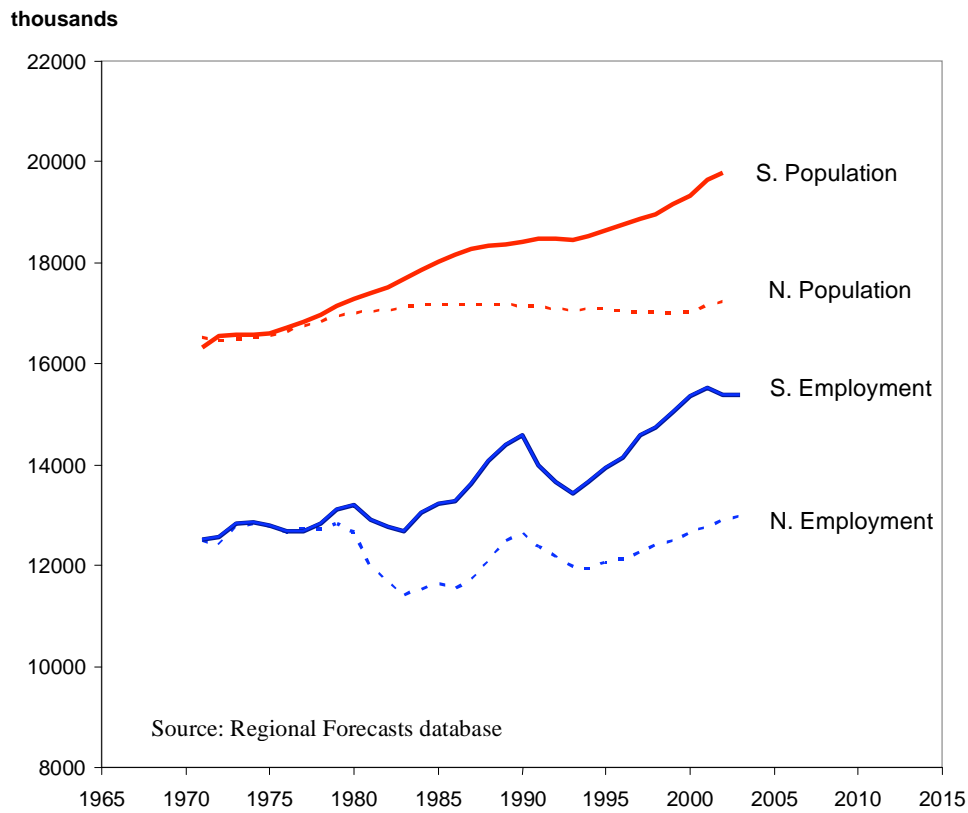
Chart 2.   Net Migration (Working Age): 1971 - 2002
3-year moving average

Source: Regional Forecasts database
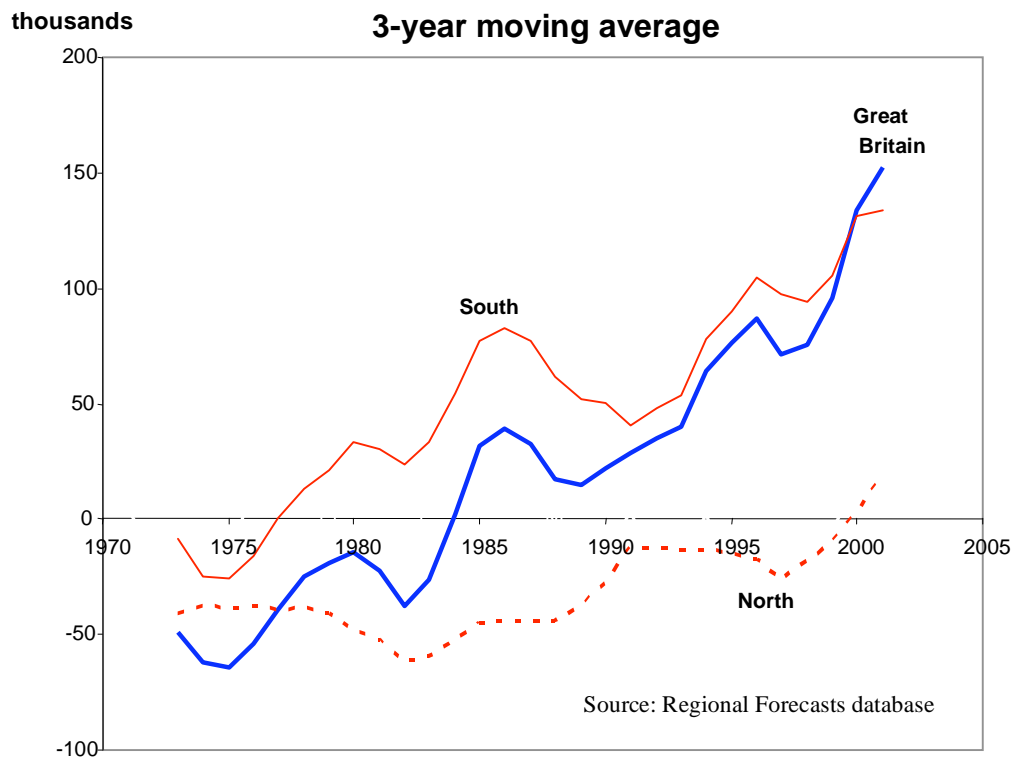
Chart 3. International migration to UK Regions 1993 - 2002

Northern Ireland
-26,000
(-2%)

Scotland
-34,000
(-3%)

Rest of England
252,000
(24%)

Wales
+21,00
(2%)

South-East
+103,000
(10%)
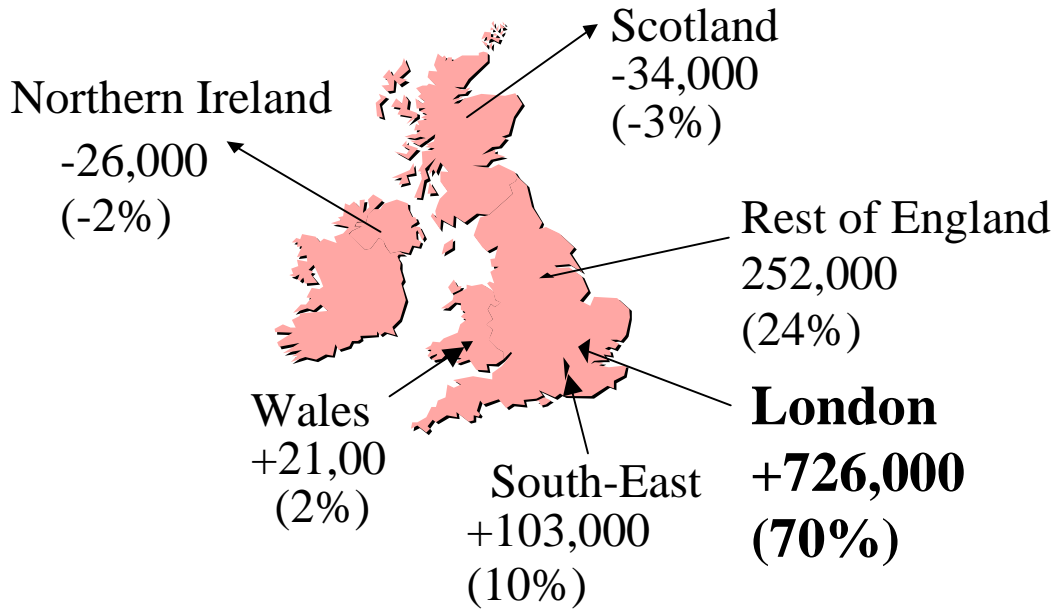
**London
+726,000
(70%)**

Source:ONS

Chart 4. Annual Net Migration to and from London 1993-2003

International

Rest
of UK

thousands

Source: ONS *Population Trends* and *International Migration Statistics*

16
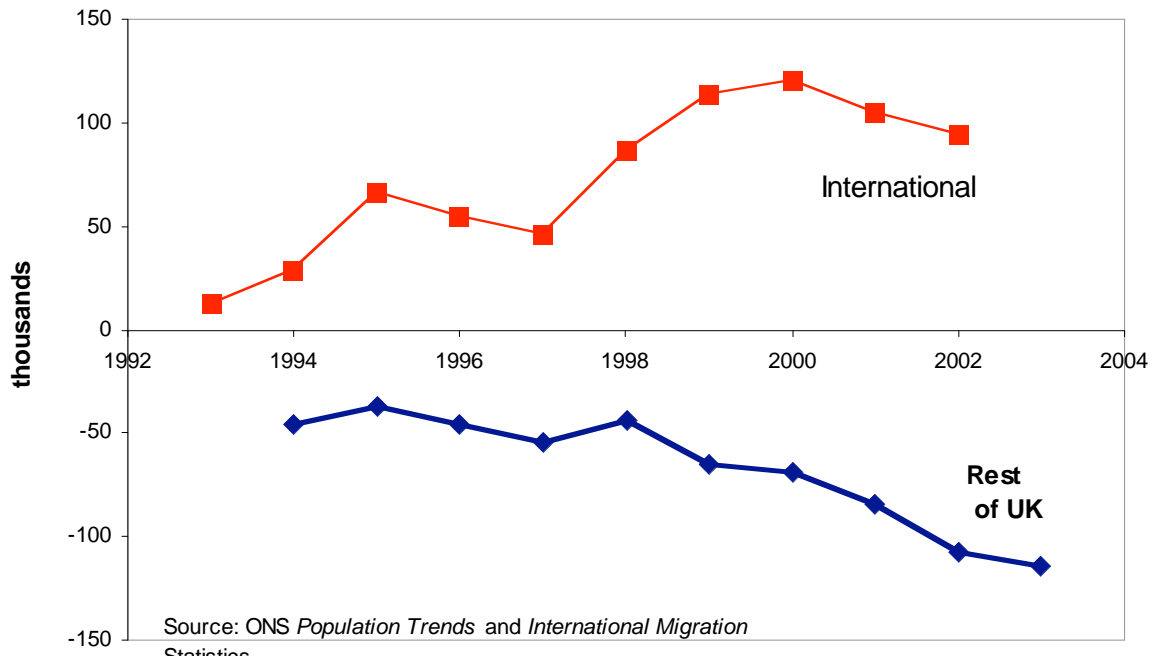
Chart 5
Employment/Working Age Population Ratios: 1971 - 2002

Source: Regional Forecasts database
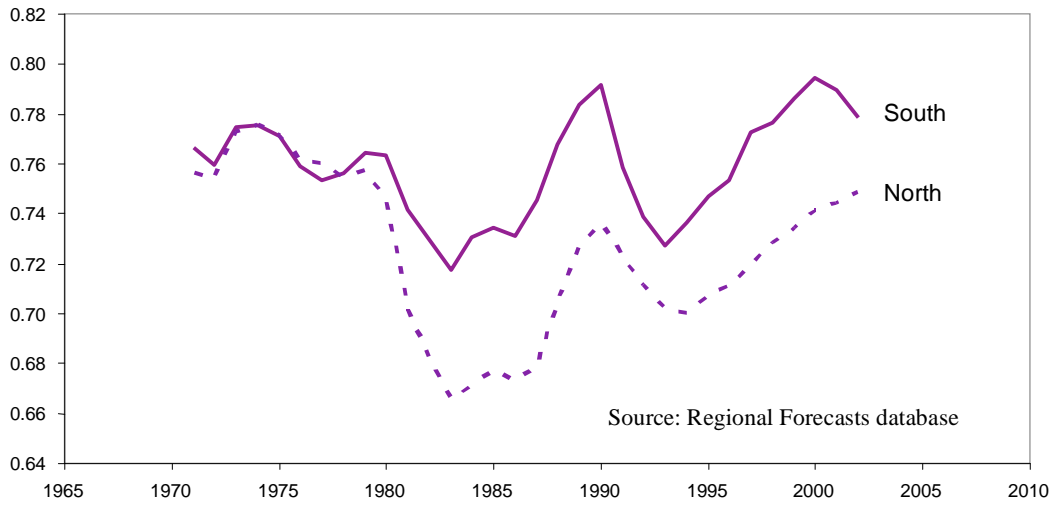
Chart 6: Employment Rates for Age 25-49 by Qualification in 2001

(a) males

(b) females
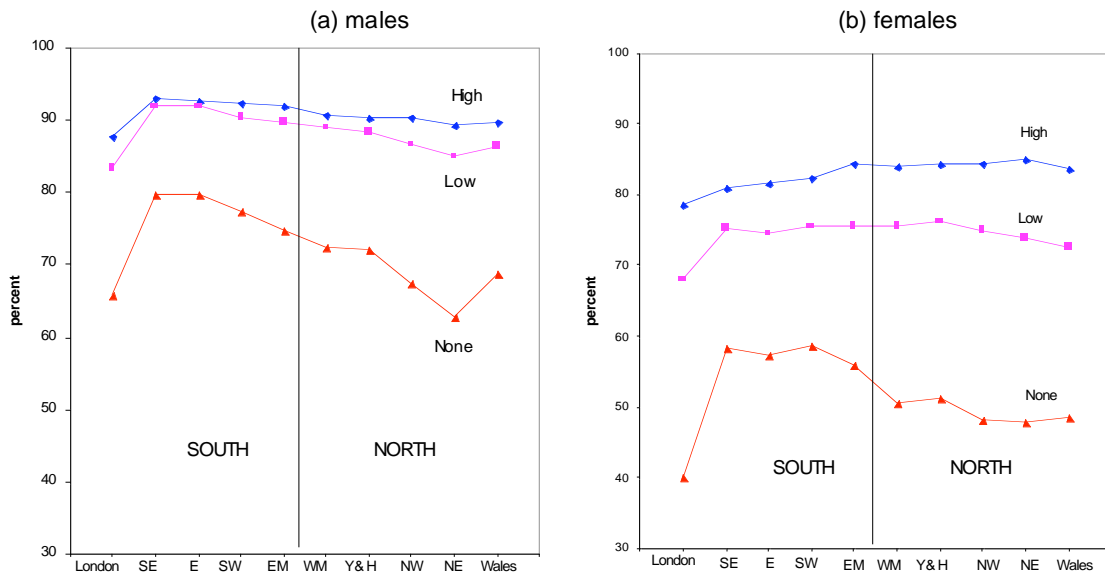
Source: Anne Green, University of Warwick

Chart 7
Per Capita Employment in Government Services
1971 - 2002

N. Health
S. Health
N. Education
S. Education
N. Pub. Admin.
S. Pub. Admin.

Source: Regional Forecasts database
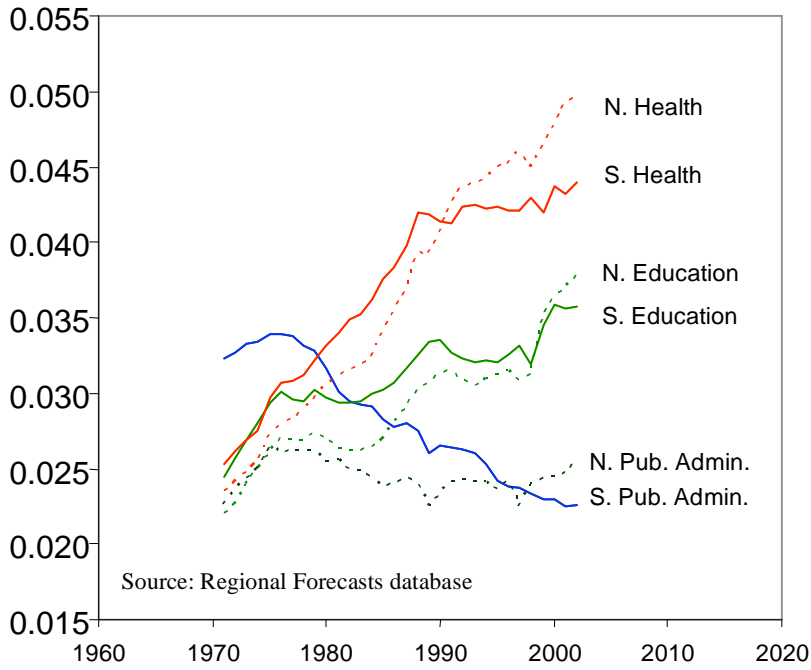
Chart 8: Employment In Greater London by Sector 1971-2003

Other

F & B Services

Government

Transportable
Goods *

thousands

Source: Regional Forecasts database

18
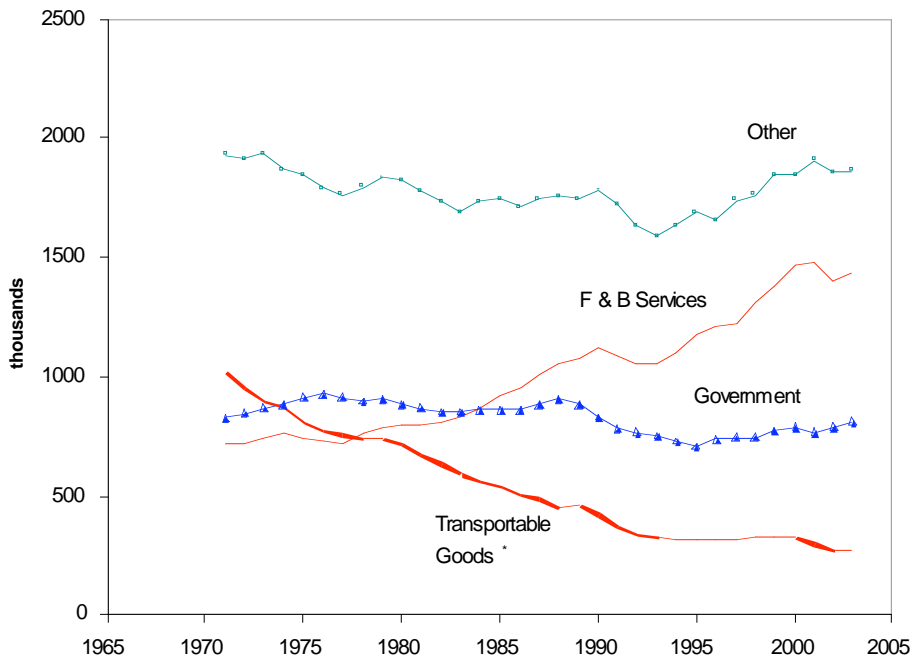
Chart 9
Ratio of North to South Employment: 1971 - 2003
indices

Government
non-tradables

population

Private
non-tradables

total
employment

tradables
(export base)

1971 = 100

Tradables = agriculture, extraction, manufacturing
+ "excess" financial & business services, "excess"
hotels & restaurants, "excess" public administration
& defence

Government non-tradables = health, education +
rest of public administration & defence

Private non-tradables = all other employment

Chart 10
Employment in the Tradables Sector: 1971 - 2002
indices

North includes the West Midlands, Wales and Scotland
Source: Regional Forecasts   database
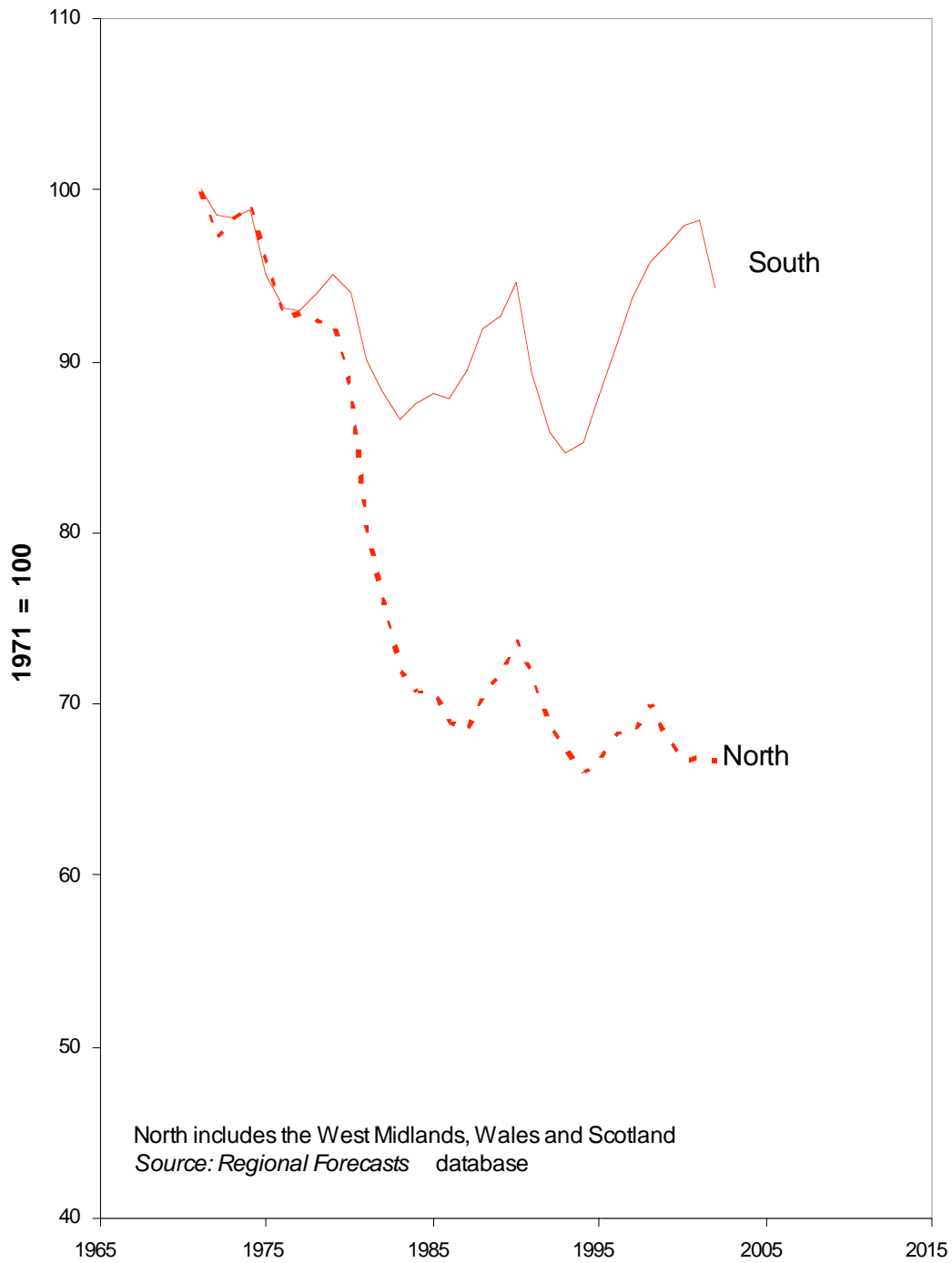
Chart 11
Regional Location of Contact Centre Agents in Mainland Britain

Source: DTI

Number of Agents (y-axis): 0 to 250,000

Size of Contact Centre (x-axis): 10-250 agents, 250+ agents

Legend: South, North

Table 1
Changes in Employment by Region and Sector: 1971-2003

Thousands

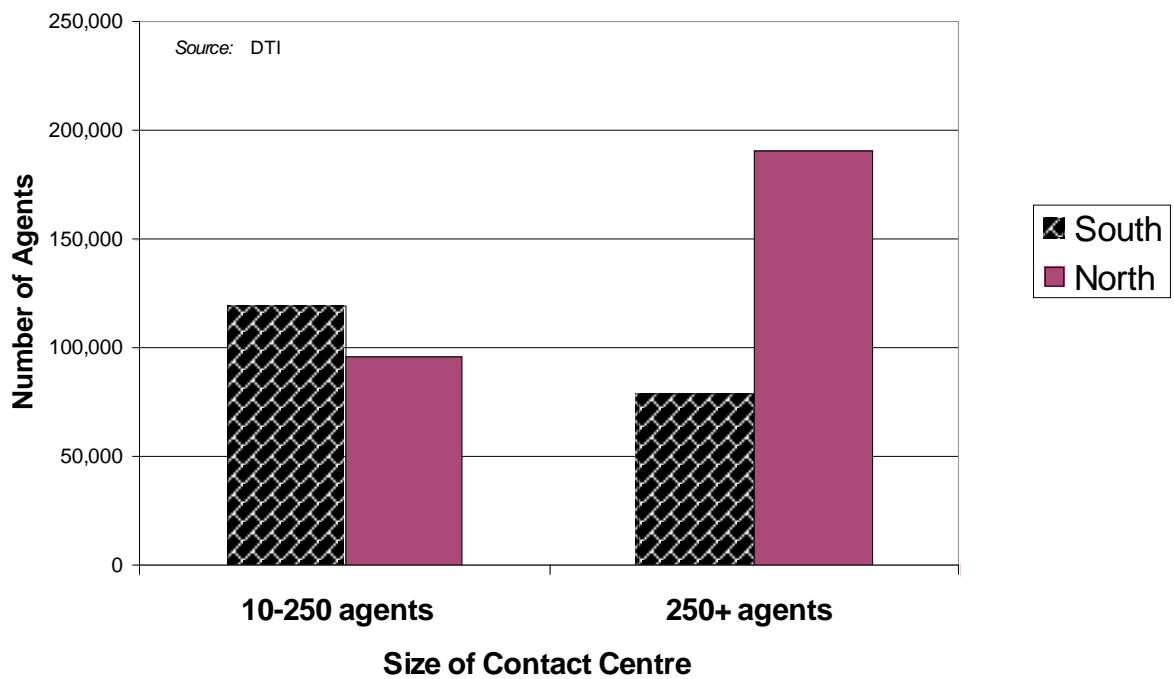|	Transport-able Goods	F & B Services	Other Market Activities	Total Market Sector	Govern-ment	Grand Total
	Col. (1)	*Col. (2)*	*Col. (3)*	*Col. (4)*	*Col. (5)*	*Col. (6)*
				= Col (1) + Col(2) +Col(3)		*= Col(4) + Col(5)*
South:						
Greater London	-748	708	-67	-107	-10	-117
South East	-310	697	748	1135	305	1439
East	-316	348	431	458	204	662
South West	-197	242	296	341	269	610
East Midlands	-364	164	289	89	206	295
Total South	**-1935**	**2154**	**1697**	**1916**	**974**	**2890**
North:						
West Midlands	-665	247	227	-192	222	30
Yorks. & Humb.	-505	209	226	-71	253	182
North West	-760	302	177	-281	270	-11
North East	-281	68	26	-187	128	-59
Wales	-205	68	81	-56	161	106
Scotland	-429	222	168	-40	255	215
Total North	**-2846**	**1116**	**904**	**-826**	**1288**	**462**
Northern Ireland	-107	53	109	56	125	180
Total UK	**-4885**	**3222**	**2709**	**1146**	**2387**	**3532**
Cf. Greater London & South East	*-1058*	*1405*	*680*	*1027*	*295*	*1323*

Notes:
Transportable Goods = agriculture, extraction (mining) and manufacturing;
Government = health and social security, education, public administration and defence (employees only).
F & B services = financial and business services

Table 2
Changes in Employment by Region and Sector: 1971-2003

percent

	Transpor-table Goods	F & B Services	Other Market Activities	Total Market Sector	Govern-ment	Grand Total
	Col.(1)	*Col.(2)*	*Col.(3)*	*Col. (4)*	*Col.(5)*	*Col.(6)*
South:						
Greater London	-73.6	98.0	-3.5	-2.9	-1.2	-2.6
South East	-39.2	284.4	66.5	52.5	56.6	53.3
East	-45.3	228.5	58.0	28.8	65.2	34.8
South West	-35.0	165.8	38.4	23.1	91.7	34.4
East Midlands	-48.0	149.8	52.1	6.3	96.9	18.0
Total South	**-50.5**	**156.9**	**33.1**	**18.6**	**44.7**	**23.1**
North:						
West Midlands	-57.4	133.6	27.7	-8.9	66.0	1.2
Yorks. & Humb.	-55.5	135.5	27.9	-3.8	79.4	8.3
North West	-60.2	111.6	14.2	-10.1	54.4	-0.3
North East	-61.8	85.0	6.1	-19.3	72.1	-5.2
Wales	-47.0	86.5	18.8	-5.9	86.8	9.3
Scotland	-54.6	116.2	18.7	-2.1	66.9	9.5
Total North	**-56.8**	**116.3**	**18.7**	**-7.8**	**68.0**	**3.7**
Northern Ireland	-44.4	187.8	54.8	11.9	113.2	31.2
Total UK	**-53.8**	**140.8**	**27.2**	**5.4**	**57.0**	**13.8**
Cf. Greater London & South East	*-58.5*	*145.2*	*22.3*	*17.6*	*21.7*	*18.4*

Notes: See Table 1

Table 3
Changes in Employment by Region and Sector: 1971-2003

Percent of total base year employment

	Trans-portable Goods	F & B Services	Other Market Activities	Total Market Sector	Govern-ment	Grand Total
	Col.(1)	*Col.(2)*	*Col.(3)*	*Col. (4)*	*Col.(5)*	*Col.(6)*
South:						
Greater London	-16.7	15.8	-1.5	-2.4	-0.2	-2.6
South East	-11.5	25.8	27.7	42.0	11.3	53.3
East	-16.6	18.0	22.6	24.1	10.7	34.8
South West	-11.1	13.6	16.7	19.3	15.1	34.4
East Midlands	-22.2	10.0	17.7	5.4	12.6	18.0
Total South	**-15.5**	**17.2**	**13.6**	**15.3**	**7.8**	**23.1**
North:						
West Midlands	-26.6	9.9	9.1	-7.7	8.9	1.2
Yorks. & Humb.	-23.1	9.5	10.3	-3.2	11.6	8.3
North West	-23.2	9.2	5.4	-8.6	8.2	-0.3
North East	-24.5	5.9	2.3	-16.3	11.1	-5.2
Wales	-18.1	6.0	7.2	-4.9	14.2	9.3
Scotland	-19.1	9.8	7.4	-1.8	11.3	9.5
Total North	**-22.8**	**8.9**	**7.2**	**-6.6**	**10.3**	**3.7**
Northern Ireland	-18.5	9.2	18.9	9.7	21.6	31.2
Total UK	**-19.1**	**13.0**	**10.6**	**4.5**	**9.3**	**13.8**
Cf. Greater London & South East	*-14.7*	*19.5*	*9.5*	*14.3*	*4.1*	*18.4*

Notes: See Table 1

Table 4

Regional Employment 1997-2003

		Market Sector		Government		Total
		North				
1997		9517		2733		12250
2003		9776		3183		12959
Change:						
Thousands		259		450		709
(percent)		(2.7)		(16.5)		(5.8)
		South				
1997		11705		2870		14575
2003		12238		3154		15392
Change:						
Thousands		533		284		817
(percent)		(4.6)		(9.9)		(5.6)

Source: Regional Forecasting database.

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Appendix: The role of the export base in a regional economy

This appendix uses a simple mathematical model to analyse the behaviour of regional employment and population. It highlights the central role played by the export base in the evolution of regional economies. In this model, the equilibrium share of a region in national employment and population depends on both the dynamism of its export base and the natural growth rate of population (balance of births over deaths). Each region has an equilibrium path along which employment and population grow at the same constant rate relative to the national average. Deviations from this path are spontaneously eliminated through migration and induced variations in the size of the export base.

Classification of activities
Economic activity in any given region can be divided roughly into three main sectors which are defined as follows.

> 1. *Extra-regional tradables.* These are goods and services which can be easily traded with economic agents located outside the region in question. In this category are most manufactures, minerals and agricultural products. Some services are also included, such as, inter-regional (or international) banking, insurance and tourism. So, too are many central government activities, such as military bases, national administrative headquarters and the like. For example, if there is a military base in a region, the services supplied by this base are classified as an "export" to the central government. The crucial feature of a tradable good or service is that its output in a particular region does not depend primarily on the scale of local demand. Every region produces more of some tradables than it consumes and exports the surplus, whilst the consumption of other tradables exceeds production and the deficit is covered by imports. The output of tradables is often called the "export base" of a region.

> 2. *Government non-tradables.* These are locally-produced public services for use within the region concerned. Under this heading are most of health, education, social services, the police, fire service and the like. The output of these services is closely linked to the size of population in a region, and government policy may ensure a roughly uniform standard of public service provision across the various regions.

3. *Private non-tradables*. These are items produced by the private sector for use by local purchasers. They are not directly traded in their own right across regional frontiers, although some of them may be used as intermediate products by the export base and hence may be regarded as indirectly tradable. The private non-tradables sector includes most consumer services - for example, the bulk of retail distribution, local transport, retail banking and insurance, hairdressing, catering and the like. It also includes most of the construction industry and certain manufacturing industries whose products are difficult to transport (e.g. bricks). Some private non-tradables are destined for use by local consumers and demand for them is determined mainly by the amount of disposable income available in the region. Others are destined for use by the government sector or tradables sector, and the demand for them depends, respectively, on the level of government services and the volume of tradables output.

The above classification is rough and the lines of demarcation between one sector and another are by no means clear in practice. However it is adequate for our purposes.

A Simple Model

Output and employment in each sector are denoted by the following symbols:

	Final Output	**Employment**
Tradables	Y^x	E^x
Government non-tradables	Y^g	E^g
Private non-tradables	Y^n	E^n
Total	Y	E

Output is measured at factor cost and hence does not include taxes on expenditure or subsidies. The final output of each sector is equal to the gross output of this sector less the output destined for intermediate use by other producers within the region. Magnitudes referring to region i are denoted by the subscript 'i'; those referring to the country as a whole have no a subscript.

Gross domestic product in region i satisfies the following equation

$$Y_i = Y_i^x + Y_i^g + Y_i^n \qquad (1)$$

For the time being we shall take regard Y_i^x as given. The other components of regional output are determined as follows.

Final demand for regional output is equal to Y_i. Of this total, an amount Y_i^g is accounted for by government services and a further amount T_i is the trade balance of the region with the outside world. We assume that final demand for private non-tradables accounts for a constant fraction c of the remaining demand. Thus

$$Y_i^n = c(Y_i - Y_i^g - T_i) \qquad (2)$$

We also assume that per capita expenditure on government services for local use is uniform throughout the country. Hence

$$Y_i^g = g P_i \qquad (3)$$

where P_i is the population of region i and $g > 0$ is the same for all regions. In the short-run we take population as given, although we later consider its long-term adjustment in response to economic forces.

From the above equations, it follows that

$$T_i = \frac{1}{c}\left(Y_i^x + (1-c)Y_i^g - (1-c)Y_i\right) \qquad (4)$$

For given Y_i^x and Y_i^g, the trade balance is inversely related to Y_i. This is because variations in Y_i affect the demand for imports.

Each region has a fiscal balance F_i with the central government and other official bodies such as, for example, the European Union. The fiscal balance is equal to the net amount of tax paid by the region to these outside bodies[14]. The size of the fiscal balance is determined by pre-set rules which govern the taxes levied on regions and their entitlement to transfers from external bodies. These rules are encapsulated in the following formula
where a > 0 and 1 > b > 0 are constants. The parameter b is a kind of marginal

$$\frac{F_i}{P_i} = b\frac{Y_i}{P_i} - a \qquad (5)$$

tax rate. As the per capita income of a region rises, a fraction b of the additional income is taken by the central government and other outside bodies, leaving the remaining fraction 1 - b available for local use. For prosperous regions the fiscal balance will normally be positive, but for poor regions it may be negative.

To close the short-run part of the model, let us consider the overall balance of payments of a region. In the case of a national economy, the following identity holds

net external lending = *trade balance*

+ *net inflow of property income*

+ *net inflow of private transfers*   (6)

− *net outflow of official transfers*

Provided the various items are appropriately and consistently defined, a corresponding identity holds for a regional economy. In the case of a region, the net outflow of official transfers is what we have called the "fiscal balance".

Suppose that net lending, net property income and net private transfers between a region and the outside world are all zero. Under these conditions, it follows from equation (6) the trade balance of the region is exactly equal to its fiscal balance with the central government and other official bodies.[15] Thus

Note that this is not an identity. Some mechanism is required to ensure that the

$$T_i = F_i \qquad (7)$$

two sides of this equation are equal. In the present model, such a mechanism is provided by variations in the level of regional output. Both variables in the above equation are functions of output, and the two sides are equalised when output takes the following value

$$\frac{Y_i}{P_i} = A\frac{Y_i^x}{P_i} + B \qquad (9)$$

$$Y_i = A Y_i^x + B P_i \qquad (8)$$

or, alternatively,

where

$$A = \frac{1}{bc + 1 - c}$$

$$B = \frac{ac + g(1 - c)}{bc + 1 - c}$$

Note that A, B > 0.

From the above equations we see that regional GDP is determined by two variables: the output of tradables (Y_i^x) and population (P_i). Moreover, GDP per

capita is determined by the ratio of these two variables $[Y_i^x / P_i]$. Thus, a region with an above average output of tradables per capita also has an above average per capita income. In fact, in our model, differences in the per capita output of tradables account for all inter-regional differences in per capita income. Fiscal transfers help to narrow differences in per capita income but do not eliminate them altogether.

Employment
To determine the level and pattern of employment, assume that

$$Y_i^x = h E_i^x$$
$$Y_i = k E_i \qquad (10)$$

where $h, k > 0$ are constants. Thus, final output per worker in the tradables sector and GDP per worker are both uniform across regions. This greatly simplifies the exposition.

From (8) and (10) it follows that

$$E_i = \alpha E_i^x + \beta P_i \qquad (11)$$

where $\alpha = Ah/k$ and $\beta = B/k$. Aggregating over the whole economy yields the following equation

$$E = \alpha E^x + \beta P \qquad (12)$$

The corresponding per capita equations are

$$\frac{E_i}{P_i} = \alpha \frac{E_i^x}{P_i} + \beta \qquad (13)$$

and

$$\frac{E}{P} = \alpha \frac{E^x}{P} + \beta \qquad (14)$$

Thus, in our model, inter-regional differences in the employment rate (E_i/P_i) are entirely explained by differences in tradables employment (E_i^x/P_i). Regions with a relatively large tradables sector have a relatively high rate of total employment. Fiscal transfers and government services help to reduce inter-regional differences in employment rates but do not eliminate them altogether.

Population and Tradables Employment
So far population and tradables employment have been regarded as exogenous. In reality, population will normally be influenced by the amount of work available in a region. Regions with plenty of jobs will attract population from regions with a scarcity of jobs. To formalise this idea, we proceed as follows. For region i the growth rate of population is given by

$$\frac{1}{P_i}\frac{dP_i}{dt} = n_i + m_i \qquad (15)$$

where n_i is the natural growth rate of population and m_i is net inward migration as a proportion of population. The corresponding equation for the economy as a whole is as follows

$$\frac{1}{P}\frac{dP}{dt} = n + m \qquad (16)$$

We assume that the response of migration to employment opportunities given by the following equation

$$m_i - m = \delta\left[\frac{E_i}{P_i} - \frac{E}{P}\right] \qquad (17)$$

where $\delta > 0$. Thus, a region with an above average employment rate has an above average rate of net inward migration. Combining (15) to (17) yields

This equation shows how the share of a region in national population in response to differences in natural growth rates and employment opportunities.

$$\frac{P}{P_i}\frac{d(P_i/P)}{dt} = n_i - n + \delta\left[\frac{E_i}{P_i} - \frac{E}{P}\right] \qquad (18)$$

Migration is not the only channel through which adjustment can take place when population and employment are out of line. A shortage of population in a region may cause a scarcity of labour and inhibit the performance of the export base via wage or rationing effects. Conversely, a surplus of labour may enhance this performance. For example, wages may be depressed so that regional producers become more competitive, or else some of the unemployed

may set up in business on their own to produce tradable goods and services[16]. To model this relationship we shall assume that for region i

$$\frac{1}{E_i^x}\frac{dE_i^x}{dt} = q_i - \phi.\frac{E_i}{P_i} \qquad (19)$$

where $\phi > 0$, and q_i is an indicator of the underlying dynamism of the regional export base[17]. The corresponding equation for the economy as a whole is

$$\frac{1}{E^x}\frac{dE^x}{dt} = q - \phi.\frac{E}{P} \qquad (20)$$

In the most dynamic regions $q_i > q$ and the opposite is the case in the least dynamic. regions.

Using equations (13) and (14), we can derive the following equations

$$\frac{P}{P_i}\frac{d(P_i/P)}{dt} = n_i - n + \alpha\,\delta\left[\frac{E_i^x}{P_i} - \frac{E^x}{P}\right] \qquad (21)$$

and

$$\frac{E^x}{E_i^x}\frac{d(E_i^x/E^x)}{dt} = q_i - q - \alpha\,\phi\left[\frac{E_i^x}{P_i} - \frac{E^x}{P}\right] \qquad (22)$$

The parameters δ and ϕ indicate the relative importance as adjustment mechanisms of migration and induced variations in the performance of the export base. If $\phi = 0$ the performance of the export base is exogenous and all adjustment is through migration.
To express the above equations in a more convenient form, define

$$Z_i = \frac{E_i^x/E^x}{P_i/P} \qquad (23)$$

$$\overline{Z}_i = 1 + \frac{(q_i - q) - (n_i - n)}{\alpha\,[\delta + \phi]}\left[\frac{P}{E^x}\right]$$

It can be easily shown that

$$\frac{P}{P_i}\frac{d(P_i/P)}{dt} = \frac{\delta(q_i-q)+\phi(n_i-n)}{\delta+\phi} + \delta\alpha[Z_i-\overline{Z}_i]\frac{E^x}{P} \qquad (24)$$

and

$$\frac{E^x}{E_i^x}\frac{d(E_i^x/E^x)}{dt} = \frac{\delta(q_i-q)+\phi(n_i-n)}{\delta+\phi} - \phi\alpha[Z_i-\overline{Z}_i]\frac{E^x}{P} \qquad (25)$$

Subtracting (24) from (25) yields

$$\frac{1}{Z_i}\frac{dZ_i}{dt} = -[\delta+\phi]\alpha[Z_i-\overline{Z}_i]\frac{E^x}{P} \qquad (26)$$

From this equation it is clear that $\overline{Z}_i$ is the equilibrium value towards which Z_i tends to return following a displacement.

The long-run growth rates of employment and population (relative to the national average) are equal to each other and are given by

$$\text{long-run relative growth rate} = \frac{\delta(q_i-q)+\phi(n_i-n)}{\delta+\phi} \qquad (27)$$

Thus, the relative growth rate of a region is a weighted average of the relative dynamism of its export base *(q_i-q)* and the natural growth rate of its relative population *(n_i-n)*.

The following are the equilibrium ratios determined by the above equations

$$\frac{E_i^x}{P_i} = \frac{E^x}{P} + \frac{(q_i-q)-(n_i-n)}{\alpha[\delta+\phi]} \qquad (28)$$

$$\frac{E_i}{P_i} = \frac{E}{P} + \frac{(q_i-q)-(n_i-n)}{(\delta+\phi)}$$

If $(q_i-q)-(n_i-n) > 0$, then compared to its population, the region will have greater than average amounts of tradables employment and total employment. A shock will disturb these ratios but migration flows will tend to pull them back again to their equilibrium levels. In the language of modern econometrics E_i^z, E_i and P_i are co-integrated. If $(q_i-q)-(n_i-n) = 0$ in all

regions, then all regions will ultimately have the same per capita amounts of tradables employment and total employment.

[14] Note that the fiscal balance excludes revenue from the export of tradable services to the central government. Such revenue is included in the trade balance.

[15] Note that the exact magnitudes of both F_i and T_i depend on how central government services and the like are allocated to particular regions. This is a complex issue which we shall not pursue here. However, provided the chosen allocation procedure is applied consistently, F_i and T_i will always be equal under the conditions assumed in our model (zero net lending by the region etc.).

[16] Cameron and Muellbauer (2000) find that regional unemployment depresses the earnings of male manual workers in the UK, but not those of other workers. This would suggest that feedback from unemployment to job creation via the regional wage nexus may be weak. However, the advent of information technology may increase the responsiveness of employment to regional wage differentials, since it increases the tradability of services. Thus, the rise of call-centres, e-commerce and the like allows service providers to exploit regional wage differentials more easily than previously.

[17] Note that this simple formulation leaves unexplained the dynamism parameter ϕ which is of decisive importance for the long-run development of the region.